

Electric Railway Journal

DAILY EDITION

Published at the Annual Conventions of the American Electric
Railway Association and Its Affiliated Associations

VOL. XXXVIII

NEW YORK—OCTOBER 11, 1911.—ATLANTIC CITY

No. 153

PUBLISHED DAILY BY

McGraw Publishing Company

239 WEST THIRTY-NINTH STREET, NEW YORK
MILLION-DOLLAR PIER, ATLANTIC CITY

JAMES H. MCGRAW, President; C. E. WHITTLESEY, Secretary.

CHICAGO OFFICE.....Old Colony Building
CLEVELAND OFFICE.....Schofield Building
PHILADELPHIA OFFICE.....Real Estate Trust Building
EUROPEAN OFFICE....Hastings House, Norfolk St., Strand, London, Eng.

Cable Address, Stryjourn, New York; Stryjourn, London—Lieber's
Code.

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TERMS OF SUBSCRIPTION

Subscription including regular weekly issues and special daily editions
published from time to time in New York City or elsewhere, postage
prepaid:

United States, Cuba and Mexico.....	\$3.00 a year
Canada.....	4.50 a year
To all Other Countries.....	6.00 a year
Single Copies.....	.10 each

Application made at the Post Office at New York for entry as mail
matter of the second class.

*Of this issue of the ELECTRIC RAILWAY JOURNAL,
DAILY EDITION, 9,500 copies are printed.*

NEW YORK—OCTOBER 11, 1911.—ATLANTIC CITY

PROGRAM TO-DAY

CONVENTION MEETINGS

- 9.30 a.m. Joint Session of Accountants' and Engineering Associa-
tions, 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.
- 11.30 a.m. Session of Engineering Association, Marine Hall, Con-
vention Pier.
- 11.30 a.m. Joint Session of Accountants' and Transportation &
Traffic Associations, Greek Temple, Convention Pier.
- 2.00 p.m. Executive Session of American Electric Railway Asso-
ciation, Greek Temple, Convention Pier.
- 2.00 p.m. Closing Session of Claim Agents' Association, Traymore
Hotel.

SOCIAL EVENTS

- 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.
- 1.45 p.m. Ladies' Afternoon, Atlantic City Country Club.
- 4.00 p.m. Obstacle Golf, Lawn of Marlborough-Blenheim Hotel.
- 8.30 p.m. Second Annual Indoor Athletic Carnival and Smoker,
Marine Hall, Convention Pier.
- 11.00 p.m. Informal Dancing, Ballroom, Convention Pier.

Address of President Brady

The address of President Brady at the opening meeting of
the American Association yesterday was a comprehensive
discussion of the activities of the association and the status
of the industry. We recommend its careful perusal to all
who did not have the pleasure of listening to it yesterday,
and those who were present at the meeting will undoubtedly
wish to review in printed form the remarks of the president.
The association is shown by him to be in a very prosperous
condition, not only as regards membership and finance, but,
what is much more important, as regards helpfulness to
the industry and activity in the technical development and
improvement of the art. The center of this work during the
year is of course at the association headquarters in New York,
whose facilities for the service of members are constantly
becoming better through the continued gathering of data. The
prosperous condition of the association does not have a
counterpart in the status of the industry as a whole. It
is to this condition and to the possible remedies that Mr.
Brady directed attention in the latter part of his address.
In unmistakable language he attributes it to lack of knowl-
edge of the real conditions on the part of the public, and
advocates publicity as the remedy—this publicity to be
carried on not only systematically but by all. With this
recommendation, which was also made by other speakers at
the meeting, we feel confident the opinions of the leading
companies will coincide. Such a plan would involve viola-
tions of some railway traditions, but the time has arrived,
if indeed it has not passed, when these traditions should
be forgotten and the new order of things accepted. In
such work a larger membership would be most helpful,
in fact almost necessary, and the concluding portions of
Mr. Brady's address outlined a suggested method by which
such an increase certainly seems attainable. This subject
will be one of the important matters to be taken up by
the incoming executive committee.

End Connections and Automatic Stops

Two of the three subjects presented yesterday in the re-
port of the committee on heavy electric traction are of in-
terest to nearly all large interurban roads. These subjects
are the end connections on cars and the location of auto-
matic train stops. The location and clearances for third-
rail working conductors, which were also considered by
the committee, affect the practice of only a few member
companies outside of the metropolitan districts. Standard
locations for end connections on cars have been considered
by the Central Electric Railway Association, which has
approved recommended locations for headlights, train-light-
ing cables and other end fittings. The heavy electric trac-
tion committee is of the opinion that it would not be
feasible at this time to standardize fully the location of all
electrical end connections on cars. Hence, in its report, it
recommends that for the present a certain definite space at
the ends of cars should be reserved for the electrical con-
nections and that the determination of the exact arrange-
ment and location of the different jumper sockets, brackets,
etc., within this space should be postponed until further
developments take place. In the Central States, however,
there is an immediate need for standardizing the location of

headlight hangers and connections, and the location of lighting jumpers, because of the rapid extension of two-car train operation on the longer interurban lines. So far as these interurban roads are concerned the locations which have been approved by the Central Electric Railway Association appear to be satisfactory, and pending the time when the heavy electric traction lines can reach a definite conclusion as to their requirements, these locations might well be adopted by the Engineering Association as recommended practice.

The location of clearance lines for automatic stops which is recommended by the committee on heavy electric traction is adapted for use only on road-beds that are fully protected from trespass by the public. On most of the cross-country interurban lines on which block signals will be installed during the next few years it would be impracticable to have automatic train stops in the middle of the track. Two Western roads, the Washington Water Power Company at Spokane, Wash., and the Key Route at Oakland, Cal., have recently installed automatic stops in connection with their block signaling, but both employ a trip arm placed above the roof of the car. This location is probably the most suitable for interurban roads. The block signal committee next year might properly consider this subject and formulate certain requirements for automatic stops which would tend to encourage the use by interurban roads of automatic stop apparatus mounted somewhere within a limited space near the top of the car body.

Work of the Block Signal Committee

Electric railway engineers and managers will find in the report of the joint committee on block signals a large amount of valuable information. In compiling the report the committee realized that the electric railway associations had never before had available for reference a comprehensive description of the theory and practice of block signaling for electric railways. Hence, in planning its year's work, the committee decided to include not only the historic and statistical phases of the subject but also definitions and descriptions of the essential parts of each signaling system which is in practical use to-day for protection of trains.

The committee, which was chosen from the Engineering and Transportation & Traffic Associations, was unhampered by any precedents. The purport of its instructions was that the committee should present to the associations a résumé of the present status of electric railway signaling. A report 124 pages in length testifies to the thoroughness with which the committee fulfilled its assignment. The plan followed was to summarize briefly the history of electric railway signaling, then to present the principles of control for the different types of signal systems adaptable to electric railway service, and then to supplement these technical data with illustrated descriptions of signal apparatus now in service on electric railways.

While this report is the most complete on the subject that has ever been published, block signal apparatus, in so far as electric railways are concerned, has developed so rapidly within the past few years and gives prospect of such frequent changes during the next few years that future committees need have little fear of a lack of suitable materials for succeeding reports.

A feature of this year's report is the tabulated information secured from member companies about their existing signal installations. It was expected that these replies would be of considerable value to the committee in summarizing the present status of electric railway block signal installations, but unfortunately there were only fifty which were sufficiently adequate for use in the report. This number is so small that we do not consider a summary of them to be a full exhibition of the extent of signaling at present on electric railway lines. Moreover, the answers in many instances show that varying interpretations were put on the committee's inquiries. Thus the committee asked for the

maximum service braking distance observed in the different classes of service, but the replies vary so widely that definite conclusions cannot be drawn. Nine roads report the use of automatic block signals with continuous track circuits, and the average length of block varies from 400 ft. to 15,840 ft. But two roads report the use of automatic signals controlled by short track circuits, while only twenty roads report the use of automatic signals with trolley contact devices. Obviously this number includes only a small portion of the roads which have been equipped with signals of this type. Practically every large interurban system and a great number of the smaller systems use at least a few blocks controlled by trolley contacts, and it is understood that during the last year the sale of this form of signal has greatly increased. Dispatchers' signals are reported in use by but six roads, with lengths of blocks varying from 3,000 ft. to 13,200 ft. This type of signal apparatus, which greatly increases the dispatchers' control of trains and has been found a valuable means for facilitating train movement, has met with widespread approval and is in much greater use than the data sheets indicate. Of the miscellaneous types of signals reported, the hand-operative block is very largely in the majority.

The newness of automatic signaling in electric railway work is indicated by column 19 of the data sheet. With the exception of some of the metropolitan transportation lines on which automatic blocking systems are employed, few electric railways report having used automatic signals for more than five years. Column 23 of the data sheet really contains the most valuable information regarding signaling that is included in the résumé of the replies. The question asked was, "in your experience, has the use of block signals aided or retarded the movement of trains?" With but three exceptions every road replied that the signals had aided the handling of trains. This answers the question so frequently raised in connection with automatic block signals. Two of the three exceptions also indorse signaling because the roads say that while their signals have retarded traffic they have increased the safety of travel, and this of course is the chief desideratum of signaling.

Accounting for Small Companies

The paper by Mr. Gault outlining an accounting system for small electric railway companies, which was presented yesterday before the Accountants' Association, is a contribution of especial value to properties of short mileage and low gross earnings. It gives a general summary of the accounting methods that may be adopted. While many of the details of the complete system described are similar to those that are in use by other companies, there are minor points of difference that are of interest. Attention may be called to the statement that a reserve fund for damage claims should be deposited in a separate bank account. This is a practice that is to be recommended. The classification of amusement park accounts might be referred to the committee on a standard classification of accounts and form of report for consideration of its applicability to other properties in similar positions. Of course, the operation of amusement parks is one that is properly outside of real railway operation, notwithstanding that it is an enterprise in which many companies are engaged. Other companies have ferryboats, toll roads, summer encampments or other similar operations, which might also be considered to advantage if the classification committee intends to take up outside operations of this character. Papers of this kind touching on the problems of small companies are of the utmost value, whether the subject discussed be of interest to the manager, the accountant or the engineer. The smaller companies seldom can afford to employ competent experts to work out these problems for them, and it is from just such helpful suggestions as are contained in this paper that a large majority of the member companies derive their greatest benefit from association work.

Conventionalities

Herman Piffletiff is Dutch.

Don't get Boardwalkitis.

A note of thanks is due the weather man.

The pretty green hedge is to look at, not to walk through.

Charlie Chapin has donated one dozen National League baseballs for the game Wednesday evening.

J. J. Morse and F. O. Grayson, of the St. Louis Car Wheel Company, were included in the party on the special convention train from St. Louis.

A lady's badge, bearing number 3771, has been lost. It belongs to Mrs. Robert F. Carr, who can be found at space 7, Dearborn Drug & Chemical Works.

Frank Hedley, veranda golf champion of the United States, was out early upon the obstacle golf course at practice, resplendent in his new outing suit.

A small oval Masonic pin has been found on the Convention Pier. The owner can secure his property by calling at the booth of the ELECTRIC RAILWAY JOURNAL.

Ray D. Lillibridge, of New York, technical advertising specialist, is at the Marlborough-Blenheim with Mrs. Lillibridge. He says he is here pure'y for recreation.

The present is to be distinctly a brides' convention. Newlyweds in many of the booths are receiving congratulations. Ask Messrs. Roswell, Farnum, Hayes and Bertram Berry. Business suffers very little from lack of attention.

A visitor at Atlantic City who had never seen a street railway convention in the process of making dropped the remark on Thursday of last week that the exhibits on the Pier presented the appearance of a conglomeration of unforeseen difficulties.

W. C. Burdick, assistant engineer of the Falk Company, Milwaukee, Wis., has been appointed manager of the special work department of this company, succeeding W. F. Carr, who resigned on account of poor health. Mr. Burdick is registered at the Dennis.

Two young Indianians named Morgan and Clark—not J. P. and Champ, but C. E. and L. J.—skipped gingerly from hotel to hotel early Monday morning challenging the world at large and anyone in particular to a game of pool. When it comes to pool they clean 'em up like the Gold Dust kids.

Several of the passengers on the St. Louis special train to the convention advised Nic LeGrand to keep after that "six bits" which he felt Mr. Paton should pay him, but the wiser heads intimated to Mr. LeGrand that inasmuch as Mr. Paton was a canny Scot, he might as well save himself the trouble.

H. A. Goode is at the convention fresh from a trip to the Coast. He reports a good time in San Francisco. J. M. Yount and Thomas Finigan of the United Railroads showed him the difference between San Francisco and New York. He bargained to reverse the process while they are in the East attending the convention.

Very favorable comment was expressed in regard to the preparedness of the exhibits at the opening of the convention and many delegates who visited the Pier yesterday morning remarked on the fact that they did not hear even the sound of a hammer. This condition is certainly very creditable to the exhibit committee of the Manufacturers' Association. It is also worthy of notice that the area occupied by the exhibits this year is greater than at any previous convention, either of this or of any other national association.

Walter H. Evans, chairman of the committee on engineering apprentices, which presented its interesting report to the Engineering Association Monday afternoon, recently resigned his position as superintendent of motive power of the Indiana Union Traction Company, Anderson, Ind. Mr. Evans will be succeeded at Anderson by R. M. Hemming, formerly general manager of the Ohio & Southern Traction Company, Columbus, Ohio. Both of these men are deeply interested in the work of the Central Electric Railway Association.

The great educational value of the exhibits to be seen on the Pier, and the businesslike methods pursued in installing them, were matters of general comment among those who very early in the convention week took the opportunity to give even a cursory examination to the display. It is a matter of general comment that if many of the directors of electric railway properties, bankers interested in their welfare and the efficiency of their management, could visit the convention and study the exhibits, the results would be of a decidedly beneficial character, both to visitors and exhibitors.

H. R. Harper, electrical engineer of the city of Melbourne, Australia, who is making a short trip through the United States on his way from London to his home, hopes to visit the convention. The lighting and power system in Melbourne is owned by the municipality and is under the engineering charge of Mr. Harper, but he is also interested in railways, as the city government is again seriously considering the electrification of its suburban system of railroads. This is the property on which a report was rendered about three years ago by C. H. Merz, of London. It comprises about 300 miles of track.

Have you seen him—a tall, lean, lank wan of the newlywed brand? He is lost somewhere among the many allurements of the Boardwalk. He was last seen holding hands with his three-day bride in a limousine wheel chair, and his devotion to her was common gossip among the guests at the Marlborough-Blenheim. The lifesavers along the beach report no evidence of his whereabouts even though their vigilance has not ceased day or night. He is E. H. Martindale, brush expert of the National Carbon Company of Cleveland, which has an exhibit on the south side of the Million Dollar Pier just opposite the sea lions. It is said that Marty is as attentive to his business and work as he evidently is to his charming bride.

A tale is being told of a cruel practical joke recently played at the expense of one of the prominent supply men at this convention. The victim has the reputation of being one of the best dressed men on Broadway. His sartorial taste excited the envy of his many friends in the supply and railway field, who decided that if they could not equal him in fine raiment they might at least make a contribution to his wardrobe. Soon after, they learned by chance that the unsuspecting object of their machinations was planning a week-end visit at the country home of one of his acquaintances, not far from New York. Realizing that he would need a choice selection of clothing in that fashionable resort, they proceeded to fit him out. One contributed a somewhat used Tuxedo suit of ancient cut, another a variety of under habiliments which showed signs of wear but were neatly darned and patched, another brought a selection of socks with gorgeous checks, and so on. A few cravats of impossible colors completed the list. These gifts were packed in a cheap imitation leather trunk, which was marked with the name of the victim of the joke and was sent by express to the house which he expected to visit two days before he was to arrive there. To complete the diabolical plot a letter was sent in his name to his expected hosts saying that his trunk had been forwarded in advance and asking them to unpack it. The sequel has not been told.

Many of the ladies are affecting walking canes. Some of the leaders among the ladies of the convention intend that this shall be a feature of all complete Boardwalk toilets.

The members of the committee on schedules and timetables are planning to present Secretary Donecker of the Transportation & Traffic Association with a loving cup as a token of their appreciation of his services as secretary of the committee during the past year.

A. H. Ford, president of the Birmingham (Ala.) Railway, Light & Power Company, is the only representative of his company in attendance this year. The other officers had to stay at home and handle a State Fair crowd this week. Mr. Ford is accompanied by Mrs. Ford, who is experiencing the delights of her first convention.

Earnest Sharp, director of Chamberlain & Hookham, Birmingham, England, is at the convention in the interest of Chamberlain & Hookham ampere-hour meter for rolling stock equipment, handled in the United States by Wonham, Sanger & Bates. Mr. Sharp is an encyclopedia on meters, having equipped 85 per cent. of all the electric cars in Great Britain and Ireland.

The many friends of L. T. Ebbson, who attended the conventions some years ago as a representative of the General Electric Company, will be glad to learn that he has been promoted recently by the Metropolitan Street Railway of Kansas City from the position of traveling inspector to the position of supervisor of rolling stock. Mr. Ebbson has been connected with the Chicago Railways and with the New York Central electrification in New York City since he left the General Electric Company.

J. H. MacAdams, manager of the Exeter, Hampton & Amesbury Street Railway, Hampton, N. H., is being congratulated on his narrow escape from death by electric shock last July. While using the telephone in his home the telephone wires became crossed with a 13,200-volt transmission line of the Rockingham County Light & Power Company, and he received the full voltage through one hand, which was resting on the transmitter, and the other hand, which was against the wall. The shock continued until the circuit-breakers opened in the power house at Portsmouth. Mr. MacAdams was terribly burned and was unconscious for several days, but he has recovered sufficiently to permit his coming to Atlantic City for the convention.

C. B. Vorse, consulting engineer British Columbia Electric Railway, of Vancouver, is one of the Pacific Coast delegates and confirms the reports which have been published of the tremendous development now in progress in the Canadian Far West, particularly about Vancouver. The rapid increase in the value of real estate in this region, as a result of the influx of settlers, has brought many fortunes almost overnight. One motorman on the British Columbia Electric Railway, for instance, is worth \$150,000, owing to a fortunate investment in real estate a few years ago, but he still remains with the company from habit rather than from necessity. Another example of the rapid increase of property values is furnished by one site which was for sale a few years ago for \$65,000 and recently changed hands at \$5,000,000. According to Mr. Vorse, if the present rate of increase in population in Vancouver continues, the city will possess 500,000 inhabitants in 1920. The British Columbia Electric Railway Company is keeping pace with the development of the city, and last year laid 100 miles of track. Its plans for the future are extensive and include expenditures during the next few years of something like \$20,000,000. Mr. Vorse's visit East is partly for the purpose of studying the latest methods of track construction for use on the system of the British Columbia Electric Railway.

SOCIAL EVENTS TO-DAY

This morning at 11:30 Leps and his symphony orchestra will give another delightful concert. In the afternoon from 1:45 to 5 p. m. the Atlantic City Country Club will be the centre of attraction for the ladies. In the evening at 8:30 the monster indoor athletic carnival and smoker will take place in Marine Hall on the Convention Pier.

MORNING CONCERT

The program of the orchestra concert, which will be given in the lobby on the Convention Pier, will include the following numbers:

1. Overture, "Merry Wives of Windsor".....Nicolai
2. (a) Evening Star from "Tannhäuser"..... Wagner
(b) Pilgrims' Chorus from "Tannhäuser" .. Strauss
3. Waltz, "Wine, Woman and Song".....Wagner
4. Fantaisie from "Carmen".....Bizet
5. Coronation March.....Meyerbeer

LADIES' AFTERNOON AT THE COUNTRY CLUB

The privileges of the Atlantic City Country Club have been extended to all of the ladies of the convention for this afternoon. The entertainment committee has arranged a clock golf competition, cards, music, tennis and tea and refreshments. Handsome prizes will be given to the winners in the clock golf contest and in card games. The golf contest will be held on the clock golf green in front of the clubhouse.

The Atlantic City Country Club has an attractive home at Northfield, which is about six miles from Atlantic City on the mainland. A sufficient number of private touring cars have been secured to take all of the guests to and from the club. These automobiles will leave the Marlborough-Blenheim and the Chalfonte hotels promptly at 1:45. The club can also be reached by the Shore Fast Line cars.

ATHLETIC CARNIVAL AND SMOKER

The athletic carnival, which will take place to-night in Marine Hall on the Convention Pier at 8:30, promises to be the greatest success of convention week. The program consists of four events. Event No. 1 will be a game of indoor baseball between teams representing the American Electric Railway Association and the Manufacturers' Association, which will be captained respectively by Presidents Brady and Castle. Event No. 2 will be a lifelike imitation of the Vanderbilt cup race with the Sauerkraut King and the Pride of Ireland at the wheels of the contesting cars. The speed limit is off. The third event on the program will be a push-ball contest between teams representing the Engineering Association and the peddlers. The last event will be a trial of strength between all of the railway-men that can be crowded on the floor and the supply men. The ladies are especially invited to witness these trials of strength and tests of skill. They will be presented with attractive souvenirs. The gentlemen will be permitted to smoke until the referee decides that the air can be cut with a knife.

Elmer J. Smith, of the Peter Smith Heater Company, is here with his big 90-hp Oldsmobile. He drove the car through from Buffalo, making the trip in record-breaking time.

Charles N. Black, third vice-president American Electric Railway Association, will be unable to be present at this convention. President Taft is to visit San Francisco this week and to present an address at the Stadium, Golden Gate Park, on October 14. As this will mean considerable extra traffic for the United Railroads, and as Mr. Black is a member of the reception committee, he could not well leave. The United Railroads, however, are well represented at this convention by Thomas Finnigan, purchasing agent, and J. M. Yount, master-mechanic, both of whom have attended many former conventions of the association in previous years.

IN A PERSIAN GARDEN

Surrounded by green hedges in a cozy inclosure in the center of the lobby of the Pier 120 ladies enjoyed an afternoon at cards yesterday. At eight tables the game was five-hundred, while at fourteen tables bridge was played, and at the remaining eight tables euchre was the choice. All of the games were progressive, the winners moving and the losers pivoting. At 4.30 play stopped and the scores were counted.

The winners at bridge were: First, Mrs. G. H. Hill; second, Mrs. W. E. Davis; third, Mrs. Merriman; fourth, Mrs. C. D. Emmons; fifth, Mrs. W. R. Lee; sixth, Mrs. Denning.

The winners at euchre were: First, Mrs. Haefeker; second, Mrs. W. E. Harrington; third, Mrs. W. R. Kerschner; fourth, Mrs. O'Brien; fifth, Mrs. Burgess; sixth, Mrs. W. J. Harvie.

The winners at five-hundred were: First, Mrs. Crawford; second, Mrs. Emory; third, Mrs. H. H. Adams; fourth, Mrs. Babcock; fifth, Mrs. Slocum; sixth, Mrs. Gennet.

The corresponding prizes for all three games were the same. The first prizes were silver water-pitchers; second prizes, silver combination vegetable dishes; third prizes, filigree silver pie dishes; fourth prizes, invalids' silver tea sets; fifth prizes, German art silver jewelry boxes; sixth prizes, German art silver tea caddies.

During the play the ladies were served with punch and dishes of bon-bons were on all the tables. The prizes were all given out in twenty minutes after play stopped. Only one tie score was made and the two ladies drew cards for the choice of prizes.

ROASTS BY THE PEDDLERS

(Printed at the Request of the Broadway Club)

Commish Dahl, of Cleveland, is sojourning in our midst. He is a pretty nice fellow for all that. If you doubt this conventional statement ask Dwight, Kuhlman's gentlemanly representative. He bought us a drink day before yesterday and we know, don't we, Dwight?

It is rumored that Old Bill Wood is a farmer. At any rate, he has a large crop. Did you get it from Tom Lymington out at Elk Ridge last Saturday week?

E. Peck and wife are visiting the convention this week. He says Atlantic City makes him think of Schenee because it's so different. Ed. runs a railroad (electric) up in New York State in the Second District, don't you, Ed.?

The rumor that young Harries has a new job is confirmed. Welcome, Gen., to the ranks of the peddlers, the army of the unemployed.

There must be lots of special work going, for Kid Evans was seen to-day on the Boardwalk with a new lid on. It looks fine, Harry. Don't believe all that the knockers try to tell you.

Charlie Castle is exhibiting with great pride a large red apple which he says his wife raised from a plate of apple sauce. Charlie is our W. K. Pres.

Have you noticed how much Pop Sisson is getting to look like another celebrity? It's all right, Pop, only look out for the copyright law.

Rumor has it that Neddie Lawless was making a loud noise on the Boardwalk last night. This is groundless. It was Jimmy Rutherford's golf hat talking to itself. Good boy, Jimmy, you are a fine little rose buyer if your hat is talkative.

Clarence Laskay is suffering from a disabled left mit. Says he was stung—by a spider.

Harry Adams has a game knee, the first on the list of cripples. Kid Evans has strained his conscience, rendering it improbable that he will last through the second game to-night.

THE MANUFACTURERS' VAUDEVILLE

Last night was a gala occasion on the Pier. The Manufacturers' Amateur Vaudeville, which was the drawing card, was presented with an all-star cast, a fine orchestra and a perfect stage setting. Long before the orchestra began the overture, "Poet and Peasant," the seats in Marine Hall were filled with an expectant audience. Boxes had been built to the right and left of the stage in which seats were reserved for the association officers and their ladies.

The headliners at Keith's or Hammerstein's had nothing on acts which R. M. Campbell, master of ceremonies and stage manager, had provided. Old favorites and new met with an equally enthusiastic reception. E. F. Wickwire, by courtesy of the Ohio Brass Company, talked a little Dutch and interspersed some dialect songs in his inimitable style. At last Herman Piffletiff was discovered. A. L. Atkinson and J. P. Thompson, by courtesy of the General Electric Company, put one over with a skit entitled "Sons of Rest," which was an imitation of two peddlers waiting for an order.

Obidiah Oatcake, a delegate to the convention from somewhere up state near Franklin, Pa., poured oil upon the troubled waters and lubricated his voice with a few songs. (His real name is Ernest Wright.) Robert T. Haines and a capable supporting company presented a playlet by George Broadhurst entitled "The Coward." There was generous applause when the Pantasote curtain went down on this act to the accompaniment of a shower of American Beauty brake shoes.

Perhaps the most enjoyable feature of the evening's program was the delightful music furnished by the University of Pennsylvania Glee, Mandolin and Banjo Clubs, which were down for three numbers, through the courtesy of the U. S. Metal & Manufacturing Company, Allis-Chalmers Company and the Westinghouse Companies. Each of these big organizations did stunts in mid-season form and came in for numerous encores. The Mandolin Club tore off a "Madame Sherry" medley and a Consolation Rag that was not too bad, while the Banjo Club played a stirring march, and in addition gave a banjo-piano duet. The Glee Club made a big hit with its clever limericks. One of them ran:

"A man from slow-town named Kruger,
Where they all take their high-balls with sugar,
Where you all pay-within
And your wifey gets thin
Holding straps so the men-folks won't hug her."

Four members of the Glee Club disguised as conductors told in song how they loved Casey, not Casey Jones, but Casey T. W. The combination of "Pickle Nickers" and "Piffletiff" was a big success.

At the last minute the committee was forced to announce that Bill Conwell and his troupe of diving sea lions would be unable to appear as the dew was not heavy enough to float the hydrobile out on the Pier. No money was refunded at the box office on this account however.

Thomas A. Edison has arrived home after a two months' automobile tour of Europe. Mr. Edison had seen a large part of Europe and was greatly impressed with the progress of the old countries. The automobile was used almost exclusively, and in the 2,000 miles that Mr. Edison motored he visited, in turn, France, Switzerland and Germany. He said that while he admired the energy and enterprise of the French and the Germans, he came back more than ever convinced that America is still the world leader in human endeavor. Mr. Edison is reported to have said: "I noted progress everywhere, but Germany is leading. I also noted that a lot of the machinery they are using was manufactured in America. I had an opportunity to visit many of the great electrical and manufacturing plants in the cities I visited.

PRESIDENT BRADY'S ADDRESS TO THE AMERICAN ASSOCIATION

To-day, for the thirtieth time, our association meets in annual convention, but the organization which in 1882 was the American Street Railway Association, and became in 1905 the American Street & Interurban Railway Association, now ends its first year as the American Electric Railway Association. This final change of name makes eminently proper a brief reference to the amazing development which the association has witnessed in the industry which it represents. The track mileage of the street railways of the United States, estimated at approximately 3000 miles in 1882, and grown to an amount slightly more than 8000 miles by 1890, now exceeds, in the case of various kinds of railways, 41,000 miles, an increase of more than 1200 per cent, with over 4000 additional miles under construction. The gross annual income, estimated at approximately \$35,000,000 in 1882, now exceeds \$500,000,000. The annual operating expenses, estimated for the earlier period at less than \$25,000,000, now approximate \$300,000,000. The number of employees, estimated in 1882 at less than 35,000, now exceeds 250,000. The number of passengers annually carried, estimated in 1882 at 1,212,000,000, is now 10,000,000,000. Most wonderful of all, practically every one of the ninety thousand and odd cars now in operation has for its motive power a force absolutely unused and unknown for the purpose in 1882. Few industries have manifested so great a power of growth. None has added more to the welfare, comfort and convenience of our people during the same period of time.

In this drama of progress, continuing for almost a third of a century, our association has played an honorable and useful part. The growth of the association itself is evidence of this. Embracing within its membership at the outset seventy-eight out of a total of four hundred and fifteen companies, it now bears on its rolls three hundred and seventy companies. While these constitute only a little more than one-third of the total number of electric railways within the United States, Canada and Mexico, in their mileage they include about seventy per cent of the total electric railway mileage, and in earning power represent over seventy-five per cent of the total earning power of all electric railway companies within the countries named. These companies operate street railways, elevated railways, underground railways, underwater railways, interurban railways and partially electrified steam railways. Furthermore, these companies are so widely scattered as to afford ample representation to practically every major governmental division within the jurisdictional limits of the organization. The association is, therefore, not only free from sectionalism, but is broadly representative of the electric railway industry throughout the entire territory coming within its scope.

Such a report of progress is cause for gratification, and compels the conclusion that an organization having a membership composed of so large and influential a proportion of the industry can and should accomplish results of high value in the electric railway field.

ASSOCIATION ACTIVITIES

Permit me to review briefly the work of the association during the past year. The four affiliated associations have given active attention to the various branches of electric railway operation falling within their respective fields. Their officers and committees have devoted much valuable time to the duties imposed upon them, and are entitled to the thanks of the association for their labors and to commendation for what they have accomplished. Noteworthy in the record of the Accountants' Association is its continued co-operation with the Interstate Commerce Commission in answering all questions propounded to the commission touching matters of electric railway accounting. No

question so propounded is answered until it has been considered by both a committee from the Accountants' Association and representatives of the commission. It is gratifying to note that the committee and the commission's representatives have finally agreed upon the answers to be made to all questions except those falling within one narrowly limited class, where fundamental differences appear to exist. The importance of this work to all electric railway companies, whether subject to federal regulation or not, and whether members of this association or not, is clear. Through such co-operation the dangers arising from the adoption of hastily formed, impracticable and erroneous theories are minimized, and a consistent code of wise and workable rules of accounting, having persuasive authority with governmental bodies everywhere, is being constructed. Matters of account connected with the National Association of Railroad Commissioners have also received the attention of the Accountants' Association. The Accountants' Association has also, through a committee, undertaken a study of the life of the physical property of electric railways. The work of this committee has progressed sufficiently to make it clear that there will finally be gathered a collection of data upon this intricate subject exceeding in value any heretofore brought together.

CO-OPERATIVE WORK

The Transportation & Traffic Association and the Accountants' Association have co-operated, through a joint committee, in the preparation of a standard method for the compilation of the expenses of freight and express traffic. The work of this committee will be presented to the two affiliated associations for their approval at this convention. The growing importance of the subject makes this report most timely. It should be remarked that the spirit of co-operation between associations, manifested by the appointment of this joint committee, is constantly growing more pronounced, thus insuring the production of results adapted to the conditions of all affected departments of electric railway operation. Another instance is found in the elaborate and pioneer report on block signals for electric railways by a joint committee from the Engineering Association and the Transportation & Traffic Association. An instance of the co-operative benefits arising from association work, although not an instance of co-operation between affiliated associations, is found in the fact that the Claim Agents' Association reports frequent instances of aid being given by one company to another in connection with the investigation and settlement of claims as the result of the close relationship of claim agents brought about through that association. It is also reported by this association that the advantages of the General Index Bureau in the detection of fraudulent claims are extensive, and justify continued support.

INTERURBAN RULES AND STANDARDIZATION

Turning again to the individual work of the affiliated associations, reference should be made to the report of the committee on interurban rules from the Transportation & Traffic Association. This report may fairly be said to be now the resultant of the best experience in interurban operating conditions from coast to coast. The code agreed on by this committee bears the distinction of having been already adopted by the New York Street Railway Association. The results of other good work of the Transportation & Traffic Association will be found in the reports of the committee on city rules and the committee on schedules and timetables. The Engineering Association, besides a continuation of its excellent work in the direction of standardization, has this year, for the first time, undertaken to co-operate in matters of common interest with other technical associations, such as the National Electric Light Association, the American Railway Engineering Association and the American Society for Testing Materials. In this way it is believed that the dangers arising from the adoption of dif-

ferent methods and conclusions in reference to the same matter by organizations approaching the subject from different viewpoints will largely be done away with. The Engineering Association has also, through its committee on way matters, developed a set of rules for the government of the maintenance of way department. Through its committee on buildings and structures, a valuable report is presented, dealing with various matters of importance, among which is that of fire protection of power houses and terminals, including open yards. The matter of specifications for overhead crossings of electric light and power transmission lines and that of clearances for third-rail working conductors have also received consideration by this association.

PROGRAMS OF ASSOCIATIONS

Your especial attention is called to the excellent programs arranged by the affiliated associations, and your attendance at the meetings at which these programs will be presented is urged. This association is engaged in serious work for the betterment of the electric railway industry, and to the attainment of that end your participation in these meetings is necessary. In this connection, reference should be made to the exhibit which has been prepared by the allied Manufacturers' Association. This exhibit represents much thought, time and pains, as well as the expenditure of much money, all for the purpose of bringing before us everything new and worthy of note in electric railway apparatus and materials. The magnitude of the enterprise is shown by the fact that the space occupied this year is 76,000 sq. ft. This exhibit is to be regarded as one of the most valuable educational features of the convention, and a careful inspection of it during the hours available for that purpose is urged as one of the means of deriving the utmost benefit from the convention.

WORK AT ASSOCIATION HEADQUARTERS

Passing to the work of the American Association itself, the constantly increasing demands upon the office in New York afford proof not only of greater activity upon the part of both parent and affiliated associations, but also of enlarged usefulness to member companies. The volume of business transacted during the past twelve months has been greater than in any previous year. To take a single item—the advance reports and papers of the various associations to be presented at this convention show an increase of about fifty per cent over those of last year, thereby entailing much additional work upon the office, through which all this matter must pass, frequently more than once. Particularly worthy of note are the constantly increasing requests addressed to the association for practical data in all branches of electric railway affairs. Some of these requests have involved much labor, in several instances even extending to the compilation of information relating to the practice of foreign companies. These inquiries frequently make it necessary to call on member companies for data. Such applications to member companies are made only when necessary to return a satisfactory response to the inquiring company, and every endeavor is made to reduce the amount of information requested to a minimum. As the basic idea of association work is co-operation, it is hoped that member companies will recognize the necessities of the case and the intention of the association to ask for no needless information and will give prompt attention to the answering of data sheets when received. In this connection reference should be made to the fact that permanent files of information in respect to important subjects are gradually being gathered in the office of the association and will become more complete from year to year. These files of information not only enlarge the amount and scope of information which may be furnished and make the same immediately accessible, but also tend to reduce the number of calls upon member companies.

At this point the fact may properly be recorded that the

entire force at the office of the association is entitled to commendation for its careful attention to the business intrusted to it, and that to H. C. Donecker, secretary-treasurer of the association, are due especial praise and thanks for his loyal, energetic and intelligent interest in and attention to the affairs of the association.

MEMBERSHIP AND FINANCE

That membership conditions and finances are in a sound and healthy condition will appear from the report of the secretary-treasurer, which will be presented at this meeting. The addition during the year of forty companies to the roll of active members and of about 150 names to the roll of associate membership speaks for itself of the work of your committees on active and associate membership.

INSURANCE

There is no single act of the association during the past year more worthy of note than the action taken upon the recommendations of the committee on insurance. These recommendations for some years have been to the effect that the association should organize a bureau of insurance, which should perform services having for their general objects the securing of more definite and full information with respect to the cost of insurance to member companies and to the insurance companies themselves, the prevention of fires, the reduction of the cost of insurance and the betterment of fire protection and insurance conditions generally. After careful deliberations on the part of your officers and executive committee, it was decided that the time for action had arrived, and Mr. Henry N. Staats, of Cleveland, was chosen as the expert of the association in charge of the bureau, under the general direction of the committee on insurance. By the arrangement made, the expense of the bureau to the association treasury will consist only of the cost of added clerical work, if any, printing, postage, and other incidental expenses, while a fixed scale of compensation is provided at which any company may avail itself of the special services of the bureau. The appointment was not made until June of the present year, but it is believed that the report of the committee will afford ample evidence of the wisdom of the action taken. There is no other direction in which wisely guided efforts on the part of the association should be capable of accomplishing greater practical results to the electric railway companies within its membership. The industry for years treated the burden of insurance as one imposed by a superior power, which could neither be shifted nor lessened. The basis upon which premiums were computed was unknown, as were also the results to the insurance companies. The compilation of statistics in 1907 and 1908 by your committee on fire insurance under the lead of the present chairman, showing that of the total premiums paid during a period of about eight years only about thirty-eight per cent had been returned to the companies in the way of compensation for losses, was the first displacement of guesswork by knowledge. This was followed by wide-spread reductions in rates on the part of the insurance companies, affording a striking example of the beneficial results possible from association work. There is no reason why still further valuable results should not be accomplished in the future, both in the way of reduced cost to electric railway companies of their insurance, and, what is of yet greater importance, the prevention of fires. The need of activity by the association to meet recent proposed action by the insurance companies upon the subject of ratings will doubtless appear from the report of the committee. I recommend that member companies give full support to the new undertaking of the association in order that the possibility of securing the benefits anticipated therefrom may be fairly tried and determined.

EDUCATION

A word should be said concerning the work of the committee on education. This committee has from time to time

recommended putting into effect an educational system for the training of young men in electric railway service. Steps were taken this year, with the co-operation of five member companies, to try out experimentally the recommendations of the committee. The results will be shown by the report, which, being founded on actual experience, should be of more than usual interest.

PUBLIC RELATIONS AND WELFARE WORK

In connection with the work of the committee on public relations, your attention is called to a compilation of the laws of the various states upon the subject of public regulation by commission or otherwise which has been prepared and is practically ready for issuance. It is believed that this compilation will be found of permanent value to member companies. The expectation is that the information therein contained will be kept current from year to year.

In connection with the work of the committee on public welfare, a bulletin covering mutual benefit associations and other forms of welfare work was issued during the year. This bulletin contains in convenient form a large amount of information not heretofore accessible, and will doubtless be the subject of frequent reference by member companies on this timely and important matter.

TAXATION AND FEDERAL RELATIONS

Much and valuable work has been done by the committee on taxation, the committee on compensation for the carrying of United States mail, the committee on federal relations, and the newly appointed committee on fares, as will appear from their reports which will be made to the meeting. Note should be made in connection with the work of the committee on federal relations that the association has undertaken to keep member companies advised of the more important features of proposed federal legislation relating to electric railway companies. Many of the member companies are engaged in interstate commerce and therefore directly subject to federal legislation. Moreover, the enactments of the federal congress are likely to serve as the models for similar legislation by other legislative bodies. Hence it has seemed that every member company has a greater or less interest in every enactment of Congress relating to electric railway carriers. There being no other convenient source of information, it has appeared to be the duty of the association to keep its members advised of the more important proposed federal legislation affecting the industry, in order that members might, if they should see fit, communicate with their representatives in Congress or take other suitable measures to avoid the dangers of improper legislation arising from ignorance, misconception or misinformation.

LOCATION OF CONVENTION

The selection of the place for holding the present convention presented one of the perplexing problems of the year. Doubtless when the convention of a year ago was adjourned practically all present supposed that the next convention would be held at some point in the central West. Such was the expectation of your officers and the decision of your executive committee. Committees from the American Association and the Manufacturers' Association visited a number of Western cities, including Chicago, St. Paul, Minneapolis and St. Louis, and carefully canvassed the facilities of other cities asking to be considered. It was finally concluded by the joint committee that insufficient hotel accommodations, convention quarters and exhibit space precluded the possibility of holding the convention this year at any of the cities mentioned except Chicago, which was therefore provisionally selected as the location. On a reassembling of the committee at Chicago to make final arrangements it was found that the information previously secured from a supposedly authoritative source to the effect that the Coliseum building could be had for the convention was incorrect, and that that building had in fact a number of months before been engaged for practically the entire period

from the middle of September to the middle of November. No other convention or exhibit hall of sufficient size being available, and other cities properly located being unavailable this year for the reasons stated, the plan of holding this year's convention in the West was reluctantly abandoned, and Atlantic City was finally chosen at the best Eastern point. Since arrangements were made to hold the convention in Atlantic City a new suggestion has been made on behalf of Saratoga which may lead to that place being shortly available as a point for the holding of a convention of the magnitude of ours. This suggestion is free from the objectionable features of the proposition which was considered by the association a year ago. Proposed additional facilities should remove some objections found to exist this year in Western cities other than Chicago. It should, however, be borne in mind that the growth of the association renders it increasingly difficult from year to year to find a city having to the necessary extent all those accommodations which the meetings, exhibits and delegates require.

REGULATION BY COMMISSION

During the past year nothing novel or extraordinary has arisen in the general relations between the electric railway industry and the public. Perhaps the most noteworthy development during this period is found in the extension of the idea of regulation by commission. Among the states which have newly adopted this method of regulation in its most modern form, Ohio and Connecticut are conspicuous. Even in conservative Massachusetts, whose pioneer railroad commission, though weak in legal power, has yet been mighty in strength, the newer ideas were vigorously urged before the legislature, and the attempt was made to confer on its commission practically all the powers of compulsion possessed by any of the later commissions. In the words of one of its long honored and leading citizens, the attempt was "in conformity with the tendency of modern thought, which recognizes no force in existence except the constable's staff, supported by the bayonet of the soldier, and regards appeal to reason as an archaic proposition," to substitute "for intelligence and reason the physical forces of the Commonwealth." These various measures, enacted or urged, taken with others of the past few years, demonstrate that the atmosphere is now charged with the commission idea. Many students of the subject believe that the final step has been taken and that this system of regulation is the method which will be permanently followed. However this may be, it is unfortunately true that in few of the states has this system been adopted as the result of a well-conceived and carefully thought-out plan of procedure. It is universally conceded that power to regulate public service corporations resides in the legislative branch of government, and it is undoubtedly true that from the standpoint of both the regulator and the regulated it should be possible to secure wiser regulation through a properly constituted commission, having opportunity and facilities to investigate before acting, than through the legislature itself. This is the theoretical view, but practical results do not always coincide with theory. Those who appoint commissioners are not all equally wise or equally unaffected by the demands of partisan obligation, or equally unaffected by the demands of partisan politics. Then, too, commissioners differ. Some are fairer, wiser, better informed, more thorough, more careful in reaching a conclusion than are others. Some, too, take a higher view of their functions and duties than do others. The only true theory is that a commission in all matters of dispute should hold itself strictly impartial, should take no important step without full investigation and hearing, and should reach its conclusions absolutely unbiased by any extraneous considerations. It is safe to say that the commission form of regulation will fail unless in the appointment of the commissioners the ideal is pursued of selecting men who are fair-minded, experienced in affairs, well informed as to the business which they are to regulate, and, above all, thoroughly

imbued with a sense of their solemn duty as arbiters to decide all matters impartially and without bias, whether the result be pleasing or the contrary to public or corporation. Again, another proven weakness in the commission form of regulation is found in the inability exhibited in some cases to discriminate between regulation and management. If authority exists to cross this line, the result of its exercise would be harmful, and even disastrous, to both public and corporation. When the State, through legislature, commission or otherwise, has enforced the duty which the law imposes on every public service corporation to furnish to the public reasonably good and adequate service of the kind dealt in at fair, reasonable and undiscriminative rates, it should not undertake, and, I submit, has no right to undertake, to go farther and supervise and control the internal affairs of that corporation. To do so means the substitution of irresponsibility for responsibility. It would constitute an unwarranted invasion of the right of property. Such interferences were undoubtedly in the mind of the Supreme Court of the United States when it said only three years ago, in speaking of measures of railroad regulation, that "in no proper sense is the public general manager."

Another difficulty with the commission form of regulation is that in the past it has generally consisted of a mixture of regulation by legislature and regulation by commission. In other words, it has not, in fact, been regulation by commission. A conspicuous instance arose in Wisconsin not long ago when the conclusion of the railroad commission of that State, formed, after a thorough investigation, that two and one-half cents per mile was a fair and reasonable rate of fare for the railroads in that State, was repudiated by the legislature, which limited the rate to two cents. There are other instances. Now it is apparent that if the legislature will observe the conclusions of a commission only so long as they conform to the preconceived conceptions of the legislature, no great impartiality can be hoped from a commission in serious cases. The fear of being overruled, and in a sense discredited, by the legislature, its creator, must constantly prejudice the commission mind. In short, so many weaknesses have been developed in the latest forms of commission regulation that the case for their permanency and finality must be regarded as still in the early stages of the trial. The serious consequences which flow from regulatory measures of an improper character render it highly important that the public entertain correct views on this subject.

The most serious question in relation to our industry before the public mind at the present time is perhaps that of the permissible rate of return on investments in public service utilities. By putting the question in this form it is not intended to admit that the rate of return upon these investments can be in fact directly limited. It is submitted that the fact is exactly the contrary. The rate of return may be, and frequently is, a factor, and often a controlling factor, in determining whether questioned rates are reasonable or unreasonable. Surely it is the law that a public service corporation cannot charge a rate unreasonably high, or otherwise unfair, merely because without so doing it cannot earn a fair return, or any return, on its investment. If this be so, the conclusion is inevitable that if the rates of such a corporation are fair, reasonable and undiscriminative, and its service is reasonably good and adequate, the corporation has discharged its full duty to the public, and the return from such rates cannot, under the guarantees of the United States constitution, and of most, if not all, of the state constitutions, be reduced by a lowering of rates, or otherwise. The view stated is, however, not the prevailing one, and in particular is not the one held by legislatures and commissions. The view current in these bodies is that plenary power exists in the legislature, and, if properly delegated, in a commission, to lower rates and exact enlarged service in any direction, subject

to no condition save that such reductions and such exactions cannot be carried to the point where the loss of revenue or addition to expense thereby caused would so reduce the return as to amount in effect to a confiscation of the property. But public power and public interest are not the same. What one permits the other often condemns. There is, however, a widely disseminated belief that the rate of return on public service utility investments not only can be but should be limited, and that the limitation should approach the point of the ordinary interest rate, or less. There is no doctrine more energetically preached than this by some of the prominent would-be leaders in public opinion of the present day. In those cases where this belief is sincerely entertained as a proposition of general application to public service businesses, it can be termed nothing but a delusion. It adds another to the many examples shown by the pages of history where a hasty generalization founded on false or insufficient premises is made the rule of action in matters of high concern. This belief can be due to nothing but a misconception of the real facts. It can have for its basis no other view than that public service businesses differ from other businesses in being practically free from risk, and offering a substantially assured source of income.

CAUSES OF THE POPULAR BELIEF

How has such a view been created? Certain prominent cases of immense returns, actual or apparent, from electric railways and other public service utilities, have done much to foster it. The sensational articles with which so many periodicals have teemed during recent years have greatly aided in its formation. More than all else, perhaps, the natural proneness of humankind to see nothing that is not open and apparent to their eyes has helped. The millions of our patrons are seen, and their payments into our treasuries are known. The cost of the service we render to each is unseen and unknown. The burdens of daily operation and maintenance, the struggle to meet the losses arising from obsolescence and depreciation, the strain to keep pace with public demands due to the growth of population or to the desire for the latest refinement in the art of transportation—these are unrecognized. The differences between properties are unappreciated. The case of the old established property, with an earning power demonstrated through many years, both good and bad, into which capital for improvements and extensions flows almost of its own momentum, is not regarded as widely different from the untried property with no history, or but a short one, behind it, with little margin between income and outage, with a future of doubt or distrust.

THE CAPITALIZATION QUESTION

Generally coupled with the doctrine that returns should be limited to a minimum is the claim that the capitalizations upon which this modest return is to be permitted should be reduced to an amount which represents the actual present replacement value of the plant furnishing the service. In other words, it is insisted that the entire burden of all losses that have arisen in the conduct of a utility shall be borne by its owners. The reason for the loss is unimportant in the minds of the proponents of this proposition. The men who installed the original horse car lines in our great cities should have foreseen that cable power would shortly offer a better means of propulsion, while those who introduced the cable car in place of the horse car ought deservedly to have been mulcted in the loss of their property because they knew not of the quick coming of electric traction. So, likewise, the pioneers in electric railway construction should have waited for the full development of the industry before they laid their rails, built their power plants, or equipped their cars, unless they were ready to bear the loss of all investments made obsolete by advances in the art or by public demands impossible to anticipate.

What could more quickly blight the growth and development of the electric railway properties of a country than to have such doctrines as these prevail? What could sooner end the promotion of new enterprises which would extend the blessings of cheap and rapid transportation into new fields? To us the mere statement of these doctrines carries refutation. Yet many hundreds of thousands of our fellow citizens hold views like these, or closely akin to them.

I have thus dwelt on these phases of our relations to the public because they clearly indicate the path which a large part of the labors of the association should follow in the immediate future. The work of economically and efficiently operating and maintaining the properties with which we are connected is important, but economy and efficiency will little avail if the doctrines indicated are to prevail. Whether they shall win or not depends on public opinion, which is nothing but the resultant of the opinions of the individuals who compose the public. Whether that opinion shall be right or wrong, fair or unfair, depends upon whether the opinions of those individuals are right or wrong, fair or unfair. During many years the practice of public service corporations was to observe silence as to all their affairs. There is little cause for wonder that as a result of this practice, taken in connection with some cases of serious corporate abuse, the public became imbued with suspicion and distrust. Prejudices and misconceptions were formed against which we must now contend. The temporary judgment of the people is often wrong. Our systems of government are founded on the theory that the people rule and that their final judgment is right. Surely, therefore, it is the part of wisdom to lay our case fully and fairly before the tribunal to which we must appeal. Nay, more, it is essential to us that we do this. The results of error in fundamental matters such as those referred to cannot be calculated. We can be certain of nothing save that they will be calamitous to all. We therefore have no choice. We must demonstrate to the people the fallacies which underlie these doctrines. But let us not underestimate the difficulties of our position. We have no spicy story to tell. We cannot drive out sensationalism by still greater sensationalism. No one will pay for the privilege of reading our arguments. Our tale is one of sober fact. It will not be listened to by everyone. The heedless will turn from it; the prejudiced will close their ears. Our appeal will attract only the man who is ready to stop and think. It must be addressed to his reason and his sense of justice. By its fairness it must commend itself to him.

In the warfare which must thus be waged against the forces of error this association should play a leading part. It is the sole representative on a broad scale of the entire electric railway industry. It should assume leadership. The various state and district associations, which have been doing splendid practical work during the past year, should co-operate. The affiliated associations and the allied Manufacturers' Association should each do its share. Every associate member should do his. But how shall the desired end be obtained? you will ask. How shall actual results be accomplished? How shall we avoid merely beating the wind or lashing the water? It is apparent that our activities must be organized and concentrated. Our membership, active and associate, must be aided in gathering and marshaling the facts and arguments on which we rely. Every member must be impressed with a sense of personal duty, as well as interest, to present our position frankly, fairly and forcibly as occasion may offer through personal argument, as well as through the press and other recognized means of publicity. Here is a field in which the smaller companies and those associated with them can do most valuable and effective work for the good of the whole industry. They are generally in closer personal touch with their public than are the larger companies with theirs. They are more likely to be regarded as component parts of the com-

munities wherein they operate. They will be listened to with less distrust. Their words will take deeper root. They are more widely scattered and hence cover a broader field. It is of especial importance that they undertake this work. Beyond this an extension of the activities of the association itself is necessary. A new field must be entered. As a potent agency in accomplishing our aims, I earnestly recommend that the association issue, at stated intervals to its members, active and associate, a publication having as a chief end the presentation of facts and arguments which refute the false doctrines we fear. Details have no place here, but permit me to add that such a publication could well be adapted to circulation beyond our membership and to quotation in the lay press.

Furthermore, the association must wage a vigorous campaign to increase its membership, both active and associate. Greater membership means greater usefulness. The issuance of the publication recommended would be of great importance in such a campaign. One important phase of that publication would be the distribution of practical information through the question box method and otherwise, as well as the keeping of members in closer touch with all association work. The interest of members in the aim and work of the association is essential to the attainment of those ends and the effectiveness of that work. Such a publication would exercise a powerful influence in stimulating the needed interest. Another means of increasing this interest is one that has been found to operate successfully in the case of another association engaged in kindred work, and the adoption of this has been strongly urged by prominent members of our own association. This is the company section plan, by which a company may, if it so desire, form a section of association members among its own forces. Such a section would be expected to study and discuss the various practical branches of that particular company's affairs, being aided therein by the association's proceedings, publications and bulletins. The advocates of this plan assert that thereby a more intelligent and personal interest in company business is fostered, employees are prepared for greater usefulness and the deadening rut of machine-like labor is avoided. I recommend that this plan be given careful consideration, with a view to the adoption of it, if the conclusion be favorable.

CHANGES IN ORGANIZATION

There is perhaps no way in which the campaign to form just and correct public opinion can be better forwarded than through work of the allied Manufacturers' Association. The interest of the members of the association is our interest, and yet they are sufficiently removed from us, and in touch with other lines of business to occupy in public estimation a more impartial position than ours. Measures have been discussed during the year to amalgamate with our associate membership the personal membership of that association, and these measures are still under consideration by a joint committee representing the two associations. The precise form in which such amalgamation may be agreed on by the committee, if it shall arrive at an agreement, is comparatively unimportant, but that the two associations shall come into closer relations with each other is not unimportant. On the contrary, this is a matter of the highest importance to the welfare of the industry to forward, which is the prime object of both associations. This association will be blind to its opportunities if it shall not enlist the hearty aid and co-operation of the Manufacturers' Association, not only in the generous way in which it has been shown in the past, but also by a closer relationship which will insure intelligent and harmonious efforts to a common end. I commend this matter to the earnest attention of the incoming executive committee.

CONCLUSION

Gentlemen of the convention, a year has now elapsed since you honored me with the presidency of this association.

During that time the officers, committees and members of this, the affiliated and allied associations, as well as the forces of the technical press, have liberally and energetically aided in advancing the interests of the association, and to them I desire to express my sincere thanks and appreciation. My conviction grows stronger as the year closes that, while the past of this association has been highly honorable and useful, the work of the future is of still greater concern and value. The possibilities are vast. Remember that we play a part in that general division of industry which more than any other perhaps has advanced the cause of civilization throughout all the centuries past—that division which has to do with the breaking down of the barriers to the intercommunication of mankind. We serve one of the strongest needs of human beings in this day, and our industry is, therefore, founded on the solid rock. Our duty is to see that the structure built thereon is worthy of the foundation.

TUESDAY AFTERNOON SESSION OF AMERICAN ASSOCIATION

The opening session of the American Electric Railway Association was called to order yesterday afternoon at 2.30 by President Brady. There was a large attendance. The first order of business was the presentation by the president of his annual address. This is published elsewhere in this issue. At its conclusion Mr. Brady received long applause.

The report of the executive committee was then read. It consisted of the minutes of the meetings held during the year. Following the report of the executive committee was the report of the secretary and treasurer. It appears in abstract elsewhere and included a list of the members and associate members of the association. Secretary Donecker announced while reading his report that since its publication in printed form the number of companies which had joined the association this year had increased from thirty-seven to forty, making the total active membership 373.

The secretary then read the report of the committee on subjects, which was represented by the papers and reports to be read at the meeting. The reports of the committees on membership, which followed, called attention to the work of these committees during the year—work which was shown by the increased number of members.

PUBLIC RELATIONS

The report of the committee on public relations, which was brief, was then read by the secretary. It suggested the selection of some one experienced in publicity work to prepare articles on different phases of electric railway operation and the making public of these articles. After the conclusion of the reading of this report the president announced that the subject was open for discussion.

James H. McGraw, *ELECTRIC RAILWAY JOURNAL*, then spoke. First he quoted a paragraph from the address presented by Patrick Calhoun, president United Railroads of San Francisco, at the 1910 convention of the American Electric Railway Association, in which Mr. Calhoun said: "No men, not even those engaged in public life, come in such close contact with the people of the cities of this country as those who manage their daily transportation. From this contact we learn an important fact—the utter indifference of the general public to what may be termed the private side of street railroading."

Continuing, Mr. McGraw said in part:

"Let us ask the question 'Who is responsible for this utter indifference? How can the public understand the railway and its problems if no one tells the story?' Some few companies, to be sure, are doing effective publicity work, but many attempts on this subject are so feeble as to be pathetic. Much has been said and written on the subject of public re-

lations, but the industry as a whole does not realize the possibilities of molding public sentiment so that there shall be co-operation instead of antagonism toward the purposes of the companies. Only a few understand the art of publicity or its effect on the public mind. Are we really studying it as a big problem or are we simply indifferent, or not thinking about it at all? We all admit the great power of the public press. The companies that have created the machinery for affording publicity regarding their affairs are reaping the benefits of this policy. I believe for the larger companies a definite policy of publicity and a specially organized department, with a capable head to handle this feature of their operations, are as necessary as a general manager. Years ago the Pennsylvania Railroad realized the necessity of meeting the situation in this way and acted upon it to the everlasting benefit of that company. Many other large corporations have followed this example and some of the important electric railway and light companies are securing similar benefits from effective publicity work. But why should not this be done in a stronger and more concerted way? Why should not the railway manager take his rightful place in the community as a man and a citizen? Does it follow that because he is the manager of the railway and the railway is corporation-owned that he is not a real, true-blue citizen interested in the best welfare of the community in which he lives? Why should not the manager hold public office, or at least belong to and take an active part in, the work of the chamber of commerce, board of trade and other civic organizations which have for their objects the betterment of local conditions?

"Suppose we make up our minds to let 'bygones be bygones' and that the public, which after all is fair, concludes to hold the same attitude toward us. Electric railways are absolutely essential to the well-being and comfort of the communities. The properties have been developed so rapidly and wonderfully from the horse or mule cars of twenty or twenty-five years ago that it is almost impossible to realize that this evolution has taken place in so short a space of time. But, notwithstanding the great progress in railway construction and operation, we appear to have gone from bad to worse in our relations with the public. The public relations side of the business has been neglected and the deadening results of this are apparent on every side. Therefore, I say it is time to have a fresh start in this end of the business. Consider what attitude the railways invite, what attitude they are fairly entitled to have the public hold. The railway is helpless without the public, but so is the public helpless without the railway. There should be co-operation, a recognition of problems that affect the one as much as the other and a frank agreement to work together for the undoubted best interests of all concerned.

"As a fundamental consideration, publicity should be real and not fancied. Newspaper men are human and have sympathies. They like to be treated frankly and trusted. They are the principal representatives of the public with whom the railway officials come in contact. They reach more people among the passengers than can be reached in any other direct way. If, when they come to the railway office on legitimate business, they are compelled to wait an unreasonable time for an audience and are not treated courteously, they resent it. If they are shown that the railway has nothing to conceal, that it is glad to assist them in any legitimate inquiry and that officials are willing to see them at all possible times, they will naturally assume a more friendly attitude.

"Real publicity of financial matters has not been practised by many electric railways. The companies should take the initiative in this matter and not wait for the public to lay down a new policy. Statements should be issued in sufficient detail to show the principal classes of expenses. Such statements should permit the public to calculate how much is being spent on maintenance in order that it may be shown

whether the property is well maintained out of earnings. They should show the proportion of taxes paid in order that the public may realize that whatever is paid is a charge that has to be met from the earnings of the company from fares.

"The companies should analyze their capitalization. In the past the capital accounts have borne some expenses that are indefensible and other expenses that should be defended to the last ditch. The public should recognize the validity of outstanding securities issued in accordance with the law. While this is the logical position of the companies, there is more that can be done. A valuation of the property should be made by every company in order that the officials may know what actual assets are owned. This valuation, of course, should not be of the purely physical items, but should include the many classes of intangible values which represent actual cash investment that should be retained in the capitalization. If, after a valuation, items are found that should not be kept permanently in the capital accounts, they should be written off by degrees. If this policy is adopted it will strengthen materially the position of the companies. While outstanding securities issued should receive full public recognition, the companies, after the experiences of the past, should live up to the highest standards of finance in all future issues of stocks and bonds.

"Again, many questions of operating problems can be treated publicly through the newspapers or otherwise to the everlasting benefit of the companies and the instruction of the public. If the companies have a difficult problem in routing so as to accommodate the rush-hour traffic, or in meeting reasonable transfer needs while preventing abuse of the transfer privilege, the public should know the facts. Why should not the operating officials as well as the presidents and the boards of directors be authorized to speak for their companies on all questions of public policy? If the public makes a complaint it is much better to give a prompt and reasonable answer and to attempt to remedy the grievance at once than to write that the matter has been referred to the proper department for investigation and—what may frequently happen to be the case—permit a long delay to intervene before the complaint is answered. The companies should open the door to the public and welcome legitimate complaints, because they frequently disclose a source of friction which can be remedied easily. It should be made easy for the public to do business at the railway office. If the principal officials are not accessible there should be competent subordinates who can take such action at once as will turn a dissatisfied passenger into a satisfied patron of the company.

"If a railway is a semi-public institution, it is also a semi-private business enterprise, and the two interests have to meet at a halfway point where they can co-operate and accomplish the best results. It goes without saying that adequate and efficient service is necessary. But what is reasonable to give on one line is unreasonable on another line. The public should be told this fact. Only so much service can be provided, and if passengers have speed in travel they do not always get seats or the utmost comfort. If they get seats and plenty of comfort they cannot always have speed. The steam railways do not give parlor-car and limited accommodations without extra payment, and street railways cannot do it, either. It is unfortunate that electric railways are still suffering from the sins of the past and the feeling that the public holds in many communities because of old cases of overcapitalization, poor equipment or shiftless management. The corporations are berated by demagogues because it is their stock in trade to follow that policy; by politicians who want to increase their public following; and by the public, largely because of ignorance of the facts. The public has been misled by perverted statements. Overcapitalization and inefficient service in some places have given color to the charges of the opposition. Yellow journals

and muckrakers have magnified these situations and enlarged upon them in a most brutal way. The voice of the alarmist and demagogue is still abroad in the land and many of the railways have been silent and failed to make their side of the case plain to the public.

"The silence has been misconstrued and the public has been led to believe that in some instances the railway corporations did not dare to reply. We must remember the will of the people in this country is sovereign; public sentiment can be molded toward the right and the protection of property as well as in the opposite direction.

"When we consider all the facts from a broad point of view, we assert, and the public should agree with us, that the street railway has been the agency which has accomplished more for this country in the settlement of outlying districts than has been done in any other important country of the world. Many of you, I think, will agree that the railways have been too liberal with their extensions. In the future, extensions should be financed on a business basis. Either they will pay and therefore should be constructed, or they will be a burden on the system for years and should not be constructed. It would not be better for the communities if extensions were restricted, but it probably would be better for many of the companies.

"The time has passed for concessions in fares and for any concessions in transfers that do not absolutely have to be made to furnish the public the accommodations to which it is reasonably entitled. Where there are state commissions, these bodies are effecting a measure of publicity that is new to many companies. In a large number of states it is no longer a question of whether there shall be a commission, but a question of whether commission regulation will work out satisfactory and acceptable conditions. The companies have the experience and every incentive to be in advance of the commission; to lead them in investigations, and to teach them the facts about the railways. The companies antedated the commissions and should create within themselves conditions that will lead to public commendation, not to more public censure.

"There is talk about the inadequacy of five-cent fares and that this is justified in many cases is indicated by the six-cent fares that have been established in Massachusetts under the authority of the conservative Board of Railroad Commissioners of that State. In many companies, however, there is insufficient knowledge about costs of operation for scientific consideration of this subject. I wish to emphasize before this association the need for a careful analysis of costs in order that the position of the companies may be strengthened in every way. The true costs should include all expenses that should be charged on account of depreciation. It has not been possible for companies to meet all the expenses arising from revolutionary changes in the art without additions to their capital account. It is improbable, however, that any such revolutionary changes will take place in the future, and certainly from this time on adequate provision should be made for the depreciation that accrues each year.

"In all these matters of costs, as well as of capitalization and operation, the remedy is publicity. Every company should have a definite policy, well understood by all the officials and employees, regarding the relations with the public. That policy must be one of frank confidence, and the company and every representative who deals in any way with the public must tell the truth. Every official and employee who thus tells the truth must have the absolute backing of the management. The public must come to learn that the company is telling the truth on all occasions. If that policy is followed public confidence in the management will increase. It pays to deal with the public in this way."

Continuing Mr. McGraw said that he believed that in following the suggestions of the president's address the

association should lead in this important work of public relations. The association had, as shown by the secretary's report, slightly less than 400 member companies. There were more than 1000 operating companies in the United States. Why should the association not have 750 or 800 members? The association was doing a splendid work. The foundation was well laid, but the biggest and broadest work was yet to be done. There were about 12,000 officials and salaried employees of the electric railways of the country, not including any wage earners. Why should not the American Association have 5000 or 6000 associate members instead of 1200, as given in the report of the secretary? About one-half of the associate membership was made up of representatives of the Manufacturers' Association. The speaker believed that every member of the affiliated organizations should become an associate member of the parent organization, as well as all of the members of the Manufacturers' Association and their representatives attending these conventions. The company section idea, of which the president spoke, would be an effective means of increasing the associate membership. The Manufacturers' Association was doing a splendid work and was living up to its present opportunities. The speaker asked, Why not make the opportunity larger and together preach the gospel, all telling the same story in the interests of the great industry which this association represented?

P. S. Arkwright, Georgia Railway & Electric Company, Atlanta, Ga., said that he was connected with a comparatively small company in a Southern community which asked the best service, but was very responsive to any generous or liberal treatment on the part of the street railway company. He took it as a matter of course that a street railway which assumed to perform the service of transportation had to give good service. It had to do so at a reasonable fare and he did not think that the company should expect any particular returns from the public simply because it had furnished good service at a reasonable fare. Owing to the peculiarity of the business, railway companies had many avenues through which to raise the opposition and antagonism of the public. The company met the public under all sorts of conditions and in all sorts of humors. Its business was transacted on a public map, laid down in the streets of the city, before the eyes of the public, which knew every mistake before even the company. The company limited the public on its transfers, as to what time they should be used, as to what place the public should change from one car to another, etc. In the nature of the business the company had to have many rules. It was running public conveyances for the convenience of the general public, and to do so it had to run counter to every separate individual convenience. So the company had many ways to arouse the antagonism of the public. Again the company occupied the public streets and nearly every hour of the day did something that somebody did not like or somebody else did not approve of.

The speaker thought that in cultivating proper relations with the public the company should start out by giving good service, as good as it could reasonably give, keep its tracks in good condition, keep its cars clean and well painted, keep its men as neat and as courteous as possible. But it must not think that when this was done and a fare was charged it was at quits with the public and the public was at quits with the company. He thought that the company had to go beyond that. It had to give the people something more than they had paid for; to treat them as Mr. McGraw had said, always with the utmost courtesy. The company was very close to the people. If a man had a dispute about a transfer, or if a conductor did not stop at one side of the street or the other, the passenger would come to the president of the company and complain about it. The company had to hold itself ready to meet any patron of the company who came in the proper way to register

a complaint or speak about the railway business. In that way the company could accomplish good; it could create a liking for a street railway company if it treated the public right, gave it more than it was entitled to, gave it more than it could properly demand, treated it with liberality and generosity.

Mr. Arkwright said that if a company got from the public only what it had the right to demand, there was not a company which could live. It was continually asking favors of the public; it was continually asking the public to put up with conditions the reason for which its managers knew but the public did not know, but which meant public discomfort. The public was crowded in the rush hours. The company knew that this could not be helped, but it was inconvenient and uncomfortable. The company asked for new franchises and for renewals of its franchises; it asked the public not to demand too long a ride or too low a fare. It was always asking favors of the public. Any street railroad company or any other company or individual that expected a favor must grant a favor. It must cultivate a kindly relation, and a railway company must cultivate kindly relations with the public, not alone with words but by acts of generosity and acts of liberality to this public.

The speaker said that whatever the situation might be in the larger cities, in those the size of Atlanta the street railway was the most important industry of the city. It represented the largest industry. It was the largest taxpayer; it had the greatest number of employees; it had the largest gross and net business. It was the first thing that a visitor to the city saw; it was almost possible to judge a town by the kind of street railway it had. The company was the most prominent thing in the city; it was the most prominent citizen in its community, and if it occupied that relation, he thought that relation ought to be sustained. The company ought to contribute within reason to any proper enterprise gotten up for the benefit of the public. His own company invited requests of this kind and always complied with them. In regard to extensions, the street railway could not extend indefinitely, but it ought to make reasonable extensions. It ought to be the cause of the growth of the community and never let it be said that it in any way unreasonably restricted that growth. It should meet demands for increased service before it was compelled to do so by order. It ought to see far enough in advance and endeavor to meet the demand before the demand reached such a point as to mean compulsion. He did not mean unreasonably frequent service, but he meant that the company should keep a little in advance of what the authorities could make it do. Sometimes the company was rubbed the wrong way and unjust demands were made of it. Sometimes these unjust demands prevailed and the company knew it was being treated unjustly. It was hard in human nature not to get sore and sour about such a thing, but the speaker did not think that even under unjust treatment a company should become sour and sore with the public. It might have a fight with the public but never a feud.

EDUCATION

Prof. H. H. Norris, Cornell University, presented the report of the committee on education and called attention to the essential features of the plan which had been tried this year. If a young man had no brain, there was nothing that could be done with him; but assuming that he had a brain he would become a better employee if his brain was stimulated. That was the theory upon which the committee on education had been proceeding for the last four years. This year the committee put its theories to a practical test. It invited five companies conveniently located to co-operate in an actual experiment. Each of these companies was asked to contribute a reasonable sum of money and five young men upon whom the committee could experiment. The results of that experiment were described in the report. The idea was that if a boy was working at

some particular job, no matter how dirty or commonplace that job was, there was more in that job than appeared on the surface. If that boy or young man could be stimulated to go further than the immediate demands of the job, then he was made to undergo a process of self-education. A young man might be turning commutators. He would be a satisfactory employee if he turned off the commutators in a satisfactory manner. However, he was not educating himself by simply smoothing off the commutators. But a commutator was an elegant piece of equipment if it was properly comprehended, so the committee's plan encouraged the young man to study the commutator and see how it is made. The committee believed that the experiment had been reasonably successful and recommended that the experiment be continued another year, and that the number of students enrolled be increased from 25 to 100.

President Brady announced that discussion of the report would be postponed to a later meeting owing to the lateness of the hour. He also announced that the address by William G. McAdoo on the subject of the Hudson & Manhattan Tunnels had been unavoidably delayed until the session of Wednesday afternoon, and the address of Charles L. Henry, president Indianapolis & Cincinnati Traction Company, on the subject of "The Interurban" had been advanced from the session of Wednesday. In introducing Mr. Henry the president said that Mr. Henry was probably the only person connected with the electric railway industry who had the honor of introducing a new word into Webster's dictionary. The word "interurban" owed its origin to Mr. Henry. An abstract of Mr. Henry's address is printed elsewhere.

After the reading of the paper President Brady announced that the discussion of Mr. Henry's paper would be postponed until a later session. He urged all delegates to be present in attendance on Wednesday so that the meeting could begin by 2.30 at the latest. A motion was made and carried that a telegram be sent to W. Caryl Ely conveying the congratulations of the association upon his recovery from his recent illness.

The meeting then adjourned.

ANNUAL REPORT OF THE SECRETARY AND TREASURER OF THE AMERICAN ASSOCIATION*

At the close of the fiscal year 365 companies were enrolled as members, a net increase of fifteen over the number shown on Sept. 30, 1910. The growth, however, is more substantial than this number would indicate, as the total membership was considerably reduced because of a number of consolidations during the year, which brought about a net loss of seven companies. Inasmuch, however, as these consolidated companies are still represented in the membership of the association, it will be seen that there has been an actual increase during the last fiscal year of twenty-two companies. It is also gratifying to note the small number of resignations and the equally satisfactory condition as regards delinquents, which indicates that the interest of the old members has been well maintained.

Associate membership now totals more than 1200, or a net increase of about 12 per cent. The number of withdrawals from this class of membership was sixty-five, which in percentage is considerably lower than that generally obtaining in organizations of a character similar to the American Association. The delinquents, it will be noted, are fewer in number than in 1910.

RECEIPTS AND EXPENSES

The receipts for the year 1910-1911 were \$43,353, or a net gain of \$3,072 over the year 1909-1910, more than \$2,200 of which can be attributed to increases in annual dues of old member companies and dues from new member companies.

* Abstract of report read before the American Electric Railway Association, at Atlantic City, N. J., Oct. 1-13, 1911.

Expenses have increased \$4,214.62, to \$40,289. Most of this increase is due to the greater amounts appropriated to the affiliated associations and to the increased cost of printing the annual proceedings, which last year covered 2100 pages, as against 1750 in 1909, or a 20 per cent increase, which in connection with the larger number of volumes distributed is responsible for an added expenditure of approximately \$1,200.

The operating expenses of the affiliated associations show an increase of \$2,200. The change in the name of the association, necessitating the free exchange of associate membership badges, entailed an outlay of more than \$400. It will be seen, therefore, that these three items of extraordinary expense account for \$3,800 of the \$4,200 excess. The amount paid in salaries is \$1,900 more than in 1910. The figures for the two years, however, are not strictly comparable, for the reason that the expenditures for salaries during the past year should be considered in their relation to the total expended for the same item in 1908, or \$9,700. This because of the fact that the organization of the headquarters force was then identical with the 1911 and normal arrangement. The office force exactly equals in number that employed in 1908, though in the meantime much work has been added, as may be seen from the consideration of the following comparisons:

For instance, in 1908 there were 262 active member companies; in 1911 there are 365. The associates in the same period have increased from 249 to more than 1200.

GENERAL DATA

The number of committees is now close to 50, as against 34 three years ago, while the individual membership of these committees has grown from 168 to considerably more than 300. Another item is the substantial increase in pages of printed matter distributed in advance of the conventions. In 1908 the association sent to the members 668 pages of such material, while in 1911 the total is approximately 1025. The headquarters also finds itself oftentimes able to assist the committees through the compilation of data and in research work. As the files of the association continue to grow, there will be more frequent opportunities to aid in work of this sort, and naturally these files will also add to the value of the work of your association, inasmuch as it will be better able to provide needed information promptly to the member companies. The data which are continually being added will also be of value in the advancement of such publicity plans as the association may elect to carry on in the future.

ODD AND EVEN STOPS

The plan of stopping cars only at every other street has been inaugurated for the rush-hour service on two of the lines of the Kansas City Railway & Light Company, and probably will be installed on other city lines. During rush hours signs reading "odd" or "even" are placed on the front vestibules of these cars, thus indicating whether a car will stop at the odd-numbered or even-numbered street. On those streets which run east and west and are named instead of being numbered the company has a sign on the poles at the corners designating in black letters on a white background whether that corner is "odd" or "even." It is well known that a considerable proportion of the schedule time of a car is taken up in loading and unloading passengers, and James E. Gibson, general superintendent, states that while exact figures are not available he is certain that the plan of stopping alternate cars at alternate streets has been of material assistance to the company and has improved the service from the standpoint of the public.

The Ford & Johnson Company is showing in space 209 a light, durable and sanitary, all-steel seat for street and interurban railway cars; also a line of fiber rush and reed furniture for buffet and parlor-car service.

OPENING MEETING OF THE ACCOUNTANTS' ASSOCIATION

President W. H. Forse, Jr., of the Accountants' Association, called the annual meeting to order at the Hotel Chalfonte at 10.15 a. m. yesterday. Mr. Forse then read the annual address of the president, which is published elsewhere in this issue.

H. E. Weeks presented the report of the executive committee and then his report as secretary and treasurer.

E. D. Gault, auditor Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, then read his paper on the subject "Accounting System for a Small Electric Railway."

Before the association proceeded with the discussion of this paper the chairman called on C. N. Duffy, Milwaukee Electric Railway & Light Company, who expressed his pleasure at being present and spoke in reference to the plan for the establishment of company sections. Mr. Duffy said that the National Electric Light Association had developed company sections very successfully. He realized that many officials of member companies, as well as employees who would take an interest in the proceedings, were unable to attend the annual meetings. The real idea of associate membership is that the work of the association shall be brought directly to the companies.

In the company sections the meetings are held monthly, so that the work is brought closer to the individuals than if they attended only the annual gatherings. Mr. Duffy referred to the matter of expenses, which he said would be only slightly, if at all, greater than with the present form of organization, while the benefits would be multiplied many times. In these times much is heard about the education of the public, education and development of employees and welfare methods. The company section would afford abundant opportunities for work along these lines. Through the great development of company sections the membership of the National Electric Light Association had been increased from 3000 to 10,000. Before the Milwaukee Electric Railway & Light Company section of the National Electric Light Association was established in September that company had among its officials five associate members of the organization. When the first meeting of the company section was held 110 members were enrolled. To establish this plan would be the most important thing that the American Electric Railway Association could do. Mr. Duffy urged the members to use their influence to secure the adoption of the plan.

DISCUSSION ON "ACCOUNTING SYSTEM FOR A SMALL ELECTRIC RAILWAY"

The discussion on the paper read by Mr. Gault was opened by Robert N. Wallis, Fitchburg & Leominster Street Railway. Mr. Wallis said that the paper was practically a textbook and spoke of the large number of small companies. According to the 1907 census report, seventy-six companies had gross earnings of over \$1,000,000, fifty of between \$500,000 and \$1,000,000, eighty of between \$250,000 and \$500,000, 182 of between \$100,000 and \$250,000, and 551 of less than \$100,000. More than two-thirds of the companies, therefore, had annual gross earnings of less than \$100,000. The association owed it to the representatives of these companies to assist them in all matters relating to their accounting. By such papers as that read by Mr. Gault help could be given to the small companies.

Mr. Wallis suggested the elimination of some features in order that greater simplicity might be attained. The small road should adopt a system that was suited to the size of its operations. Mr. Wallis knew of a small system which combined the voucher record with the cashbook. There was no reason why a combined record of this nature should not be used. He would suggest the combination of several of the records. The use of the journal might be confined, as stated,

very closely to a record of non-cash items. He thought that an accounts-payable ledger was absolutely necessary, even on the smallest property, although personally he liked cards a little better than loose-leaf sheets. The question of vouchers could be simplified a good deal on a small property by the use of the original bill and by sending a simple voucher check. The classification of park accounts suggested by Mr. Gault was complete and might be adopted.

E. L. Kasemeier, Ohio Electric Railway, believed in keeping the accounts of a small road in the same manner as a large road. Not much work would be required to do this on a small road and standard methods would be an advantage.

G. B. Cade, Atlantic Coast Electric Railroad, said that he used the standard classification of accounts and two men in the accounting department did all the work of the department. About 60 per cent of the total receipts were taken in during the four months of the summer season. All the books were closed and the accounts completed inside of two days. He did not keep a detailed job-order system, but kept a record for the purpose of reporting information and could tell the cost of any job.

E. L. Schmock, Cleveland, Painesville & Eastern Railroad, kept a separate ledger for job orders and made the journal entry at the end of the month. If a car was rebuilt to any material extent or a side track, addition to the power house or lighting line should be constructed, a job order would be prepared.

J. N. Joel, Utica & Mohawk Valley Railway, explained the job-order system in use by that company. The road is divided into sections and to each section a number is given. As the work is done by uneducated men, all that the time report shows is the number of the section and the number of hours' work on the job. Payrolls are distributed according to the job-order number and the accounting department furnishes the proper number and name of the construction account. Each order shows the total expended for the month, divided under different headings. The job-order report covers 150 pages each month.

Perry L. King, San Antonio (Tex.) Traction Company, had used the job-order system to great advantage. Expenditures were carried directly into the general ledger and consolidated at the end of the year.

Mr. Kasemeier referred to the use by the Ohio Electric Railway of "a.f.e.'s," or authorizations for expenditures. These are given numbers and charged on the books by numbers. A sheet is kept for each job. This shows the amount authorized, the amount expended to date and the balance unexpended. The amount authorized cannot be exceeded unless additional authority is given.

W. F. Ham, Washington Railway & Electric Company, spoke of the relative importance of the records affecting construction and operation. No matter how small the company might be, it was very important that the expenditures for construction should be kept in such shape as to afford the necessary information and a permanent record. The time would come when operating records would cease to be of particular importance, except that the general results should be known. But it was essential that a record of cost should be kept in good shape. In many cases where information regarding past costs was desired it was not obtainable, although at some time such information had undoubtedly been in the possession of some previous official of the company. Permanent records should be made for the information of the official who would go over the property at some future time.

Robert Morrison, Jr., Michigan United Railways, agreed fully as to the necessity of having the accounts complete. In the case of his company several properties had been consolidated and nothing was to be found in the records regarding the early costs. Now a complete record was kept. The job-order system was used and a cost analysis sheet made up once a month.

Mr. Cade said he made up every year a detailed permanent record of construction expenditures.

Mr. Morrison thought that it was desirable to keep an accounts-payable ledger. It helped to prevent the duplication of vouchers and was convenient for the purpose of showing expenditures over a certain period.

Will Browne, Utah Light & Railway Company, referred to the desirability of entering bills in the accounts-payable ledger as soon as they reached the office.

F. E. Smith, Chicago Railways, thought that if a road purchased, for instance, from 100 manufacturers there would not be occasion to know how much had been bought from more than two or three.

C. E. Calder, Eastern Pennsylvania Railways, said that the accounts-payable ledger had been very valuable. It enabled the company to refer to former prices and firms with which there had been transactions.

J. H. Neal, Boston Elevated Railway, said that there was great danger of the payment of duplicate bills. He thought that in corporation accounting the accounts-payable ledger was disappearing rapidly and a duplicate of the voucher was taking its place. When bills were entered on a voucher a carbon copy of the voucher was made and filed alphabetically.

F. B. Lasher, New York State Railways, submitted a voucher record sheet that gives some detail, but is a substitute for a voluminous record sheet.

Prof. M. E. Cooley, of the University of Michigan, who is to address the Accountants' Association on Thursday morning on the subject "Overhead Charges," was requested by President Forse to speak to the members and explain his regret at his inability to appear before the association last year as he had expected to do. Professor Cooley said he realized in his own work in connection with valuations of properties that the engineer labored under a serious handicap because of his lack of knowledge of accounts. He wished that he were a thorough accountant. Professor Cooley said that he would be glad to receive suggestions as to the specific character of overhead charges which the members would like to have discussed.

On the motion of H. J. Davies, Cleveland Railway, the privilege of the floor was extended to Professor Cooley.

REPORT OF COMMITTEE ON INTERLINE ACCOUNTING

In the absence of L. T. Hixson, chairman of the committee on interline accounting, the report of this committee was presented by E. L. Schmock. This report is published elsewhere.

Mr. Forse called attention to the last paragraph of the report. A previous report on this subject, made about two years ago, recommended the unit type of waybill. There was a difference of opinion among interurban accountants who had interline business regarding the use of the unit or the blanket waybill and opinions would be a help.

H. S. Swift, Toledo Railways & Light Company, said that some interline billing was done by his company. When the report recommending the use of unit waybills was presented before the association he thought of introducing it in the Toledo company, but found that it would not be acceptable to roads with which an interline business was done. Except where reasons of that character existed, however, he thought that the unit type of waybill would be advantageous.

H. B. Cavanaugh, Cleveland, Southwestern & Columbus Railway, said that the use of the unit waybill made it necessary to carry one for each shipment and increased the number of bills to be handled.

Mr. Morrison said that with his company a great many small shippers required a copy of the waybill. It would be manifestly impossible to have the necessary three copies of a unit waybill made, particularly by other roads concerned in interline shipments.

Mr. Forse said that for companies doing a purely local business he believed it was an advantage to have the ex-

pense bill written by the forwarding agent. The unit waybill was an advantage in case wagons were waiting for shipments.

REPORT OF COMMITTEE ON CAR MILES AND CAR HOURS

The report of the committee on car miles and car hours was read by C. N. Lahr, chairman, Northern Ohio Traction & Light Company. This report is published elsewhere in this issue.

Mr. Duffy said that the Milwaukee Electric Railway & Light Company was very much interested in the matter of the application of the car mile or car hour. It seemed to him that the weight of the car, the speed and the character of operation as between city, suburban or interurban, had to be considered. In the Milwaukee operations one operating company owned the suburban and interurban lines and another company the city system. The suburban and interurban cars were operated by the city company inside the city limits. The company had gone very carefully into the question of which would be the better unit for accounting for the operations of the suburban and interurban lines inside the city limits. The wages of conductors and motor-men could not be apportioned on the car-mileage basis on account of the varying speeds in the different classes of service. In addition to this question there was the problem of proper division of the Public Service Building terminal and of the administration expense. The car hour was less unsatisfactory than the car mile because of the impracticability of apportioning many expenses. It was entirely proper that some standard should be established, but there were times when varying circumstances had to be taken into account.

Mr. Kasemeier said that the purpose of the committee was to afford a basis that would keep the comparisons fair from year to year.

Mr. Ham said that the Washington company had been confronted by peculiar conditions, and could not keep its car miles in the manner suggested. He thought that the committee might go a step further and show motor-car and trail-car mileage. In the operation of trains on elevated roads and subways trail cars were used and the subject would be dealt with more fully if the committee took up those topics. He would also like to have the committee consider the feasibility of the unit "seat miles." This unit, it appeared to Mr. Ham, eliminated many of the disadvantages of the car mile unit. If there was any practical way of working out a means for the adoption of this unit it ought to be considered. It would be desirable to continue the committee with a request that it amplify its report so as to show separately motor and trail cars and a consideration of the seat-mile unit. Mr. Ham moved that this be done.

Mr. Wallis thought that the seat mile or passenger seat mile had been suggested by Frank J. Sprague about fifteen years ago. He knew of one property which used this unit satisfactorily for comparison of results of operation of different divisions and lines and to show whether single-truck or double-truck cars should be operated on certain lines.

Professor Cooley said that he thought that the subject was worthy of further work by the committee. The car-mile unit became an important item during the Chicago appraisals of 1906. In the valuation of franchises it was finally decided to use the car mile as a basis. This was not wholly satisfactory, but it was the best unit known at that time. The accounts had been kept so that they showed the division of earnings by lines and earnings were distributed in proportion to the car mileage on each section. A car-seat-mile unit might be very useful.

Mr. King suggested consideration of the ton mile as a satisfactory unit.

F. E. Smith, Chicago Railways Company, said that the power-mile had been used by his company.

In view of the discussion on the paper it was suggested,

in accordance with the motion of Mr. Ham, that the committee should be continued and asked to consider the other units suggested.

M. R. Boylan, Public Service Railway, asked whether the committee had found that work-car hours are reported in total car hours and thus used for statistical purposes.

In the ensuing discussion it was brought out that companies showed the total car hours made by work cars, but did not use them in the statistical compilations.

President Forse then announced the appointment of the following committees:

Nominating committee: W. B. Brockway, M. R. Boylan, E. L. Kasemeier, H. B. Cavanaugh, H. M. Grafton.

Resolution committee: F. A. Henly, J. H. Neal, R. N. Wallis, H. D. Vickers, Arthur A. Wilbur.

The association then adjourned. A convention photograph was taken immediately after the adjournment. The members then went to the Marlborough-Blenheim Hotel for the annual "get-together" luncheon.

TUESDAY MORNING SESSION OF CLAIM AGENTS' ASSOCIATION.

The first business meeting of the Claim Agents' Association was held at the Traymore Hotel Tuesday morning. The session was the best attended in the history of the association, over sixty-five members being present. The first order of business was the presidential address by H. V. Drown. Mr. Drown said he had confined his efforts to three main issues, not because there were no other perhaps equally important matters worthy of attention, but because he felt that to have attempted more would have resulted in confusion and lack of accomplishment. His first object had been to encourage a more general and systematic use of the index bureau; his second, to promote a general co-operation among claim men to the end that they might work together and for each other whenever and wherever possible and practicable; his third, to increase the attendance at the conventions. He had received courteous and prompt replies to his various communications on these subjects, and had been greatly encouraged.

He felt that the index bureau was now a fixture, and that it would become proportionately more valuable as the number of claimants' names on file increased. He had hammered so hard on this subject that some might get the impression that he considered this work a sort of panacea for claim department ills. He did not so consider it, but believed the work absolutely essential to a well-conducted claim department. In these strenuous days, when there was so much more to contend with on all sides than in the halcyon days of old, the claim agent who did not use every legitimate means of minimizing his expenditures was losing his grip.

His second object, to encourage co-operation among claim agents, apparently did not need much promoting. He had personally received requests from claim men from all parts of the country to handle work for them in his territory, and he had made many similar requests. The work he had thus assigned had been admirably handled in each case, and at a great saving in railway fares and incidental expenses.

The third object, that of increasing the attendance at the conventions, had been achieved, as was shown by the attendance. It was his hope and belief that those who had come for the first time would find it so well worth while that they would come each year thereafter. Not a delegate or guest should be allowed to go home with the feeling that the good right hand of fellowship had not been extended to him or that he had not had an opportunity to exchange his ideas with his fellow workers. In conclusion Mr. Drown expressed his appreciation of the hearty support given him by the members of the association and the various committees, and said he was especially indebted to B. B. Davis, secretary of the Claim Agents' Association, and H. C. Donecker, secretary of the parent association.

The first papers were on "Trainmen, Their Selection and Method of Instruction in Order to Obtain Complete and Intelligent Accident Reports," by E. P. Welsh, attorney United Railways Company of St. Louis, and A. E. Beck, claim agent British Columbia Electric Railway. In the absence of Mr. Beck, the latter's contribution was read by George Carson, claim agent Seattle Electric Company. There was a general discussion on this topic led by F. W. Johnson, Philadelphia Rapid Transit Company.

AFTERNOON SESSION

The first business of the afternoon session was papers on "The Practical Value of the Index Bureau, with Some Statistics and Illustrations," by H. R. Goshorn, general claim agent Philadelphia Rapid Transit Company, and Cecil G. Rice, superintendent of claim department Pittsburgh Railways. Mr. Rice was present to read his paper, but C. B. Hardin, claim agent United Railways of St. Louis, read the paper of Mr. Goshorn in the latter's absence.

Messrs. Hooper and Holmes, of the Hooper-Holmes Bureau, were present. Mr. Hooper made an address on the value of the index bureau in claim agent work on electric railways. After some discussion on this subject a temporary adjournment was taken for the purpose of having the annual photograph made.

Upon reassembling, the first order of business was the papers on "The Prevention of Accidents," which were divided in two parts as follows: (a) "What Can Be Done to Increase the Interest of Employees of All Departments in This Work," (b) "The Best Means of Promoting Greater Caution on the Part of the Platform Men," by E. C. Carpenter, claim adjuster Indiana Union Traction Company, and F. J. Whitehead, secretary and claim agent Washington Railway & Electric Company. In the absence of Mr. Carpenter, the latter's paper was read by Mr. Hardin. After discussion of these topics, a vote of thanks was extended to the authors of the papers of the day.

Upon motion a committee was appointed to draft resolutions of condolence on the death of E. R. Roberts, claim attorney Knoxville Railway & Light Company. These resolutions will be forwarded to Mr. Roberts' widow and to the Knoxville company.

The following gentlemen were appointed as a nominating committee to report Wednesday morning: C. B. Hardin, St. Louis; James R. Pratt, Baltimore; William Tichenor, Indianapolis; George Carson, Seattle, and R. E. McDougall, Utica.

The meeting then adjourned.

OBSTACLE GOLF NOTES.

Some phenomenal scores were made on the obstacle golf links yesterday. Frank Hedley made the first hole in 1 and returned a card of 28, or one under par for the nine holes. W. O. Wood earlier in the day made a score of 30, and the betting was lively that he would win. Excitement ran high after Frank Hedley's first two holes indicated that he was out for a record, and the King of Queens helped out the noise by announcing the score of Mr. Hedley after each hole. The ladies are evincing great interest in the game. Mrs. Frank Donohoe made a 27, and this score is likely to stand as the amateur or even the professional record for the course.

The number of delegates and manufacturers' representatives registered up to 5 p. m. Tuesday almost equaled the registration for the entire week last year. The Manufacturers' Association had given out 1098 badges. The American Association had registered 200 members, Accountants' Association 90, Claim Agents' Association 70, Engineering Association 235, Transportation & Traffic Association 130. In addition to these 125 guests, 60 associate members, and 290 ladies had been registered. The total at the end of the day therefore was about 2300.

MEETING OF THE ENGINEERING ASSOCIATION

The session yesterday morning of the Engineering Association was called to order at 10 o'clock by President Harvie, who reminded the members that the first meeting of the American Association would occur yesterday afternoon, that it was open to all members, and that all those who could attend were urged to do so.

HEAVY ELECTRIC TRACTION

The report of the committee on heavy electric traction was then read by E. R. Hill. This report is published elsewhere in this issue.

The first discussion was on a letter from E. B. Katte, chief engineer electric traction New York Central & Hudson River Railroad. This letter was read by the secretary and follows:

"Again I am prevented from being present at the session of the Electric Railway Engineering Association at which the report of the committee on heavy electric traction will be presented. I am particularly sorry because I wish to urge upon our association the advisability of adopting the third-rail clearance diagram presented by the committee in Fig. 1 of its report. This will be a great step toward standardizing electric traction, and our association will be the first to have adopted a workable third-rail clearance diagram.

"The sub-committee of the committee on electricity of the American Railway Engineering Association has adopted a similar diagram and the report has been sent to the committee for comments, and I have every reason to believe that these will be favorable and that the diagram will be presented to the association at its spring meeting. If at that meeting it could be said that the American Electric Railway Association had adopted the diagram it would not only add strength to the committee's report, but it would show that the electric association was alive and ahead of the times, as it should be in electrical matters.

"Regarding the recommended practice for location of automatic train stops shown on Fig. 2, this location could not be adopted on the New York Central & Hudson River Railroad without very costly changes in steam locomotive equipment, and I doubt very much whether such a location could ever be accepted. However, as recommended for the guidance of companies designing new equipment I can see no objection to it.

"Concerning the specifications for heat-treated carbon steel axles, shafts and similar parts, I would say that there is little need for such a specification in steam railroad or heavy electric traction practice, for the reason that the clearances are not so limited as to require the use of this more expensive steel. However, as a specification for those who need this character of steel I think it acceptable, and it represents a good deal of very hard and conscientious work on the part of those well qualified to pass upon such matters.

"I am looking forward to being present at the convention on Thursday and Friday and will, I hope, be able to participate in the discussions on those days and especially at the session devoted to the committee on standards."

R. C. Currie, New York Central & Hudson River Railroad, thought the clearance diagram in the report particularly valuable and agreed with Mr. Katte that it would be very desirable for the association to adopt such a diagram. He asked why the committee had included a definition of rail bonds in its report and had suggested only two definitions.

Mr. Hill, in replying for the committee, said that these two definitions had been approved by the American Railway Engineering Association (formerly the American Railway Engineering & Maintenance of Way Association), and as these definitions were satisfactory to the committee it had thought it wise to recommend them to the American Electric Railway Association. Similarly the committee of the former association will recommend the clearances of the

Electric Railway Engineering Association. Next year it might be proper to suggest eight or ten, or perhaps more, definitions. Mr. Hill thought the definitions of gage very important, as many people think it proper to measure the gage of the third-rail from the gage line of the track to the center of the third-rail, but as third rails vary in width from 2 in. to perhaps 4 in., this was not a very accurate method.

G. W. Palmer, Boston, said that with all due regard to the good intent of the committee on standards the best opportunity for the full and free discussion of the subject was in the convention hall.

Referring to paragraph 10 of the specifications dealing with heat treatment, F. R. Phillips, Pittsburgh, asked what consideration had been given to heat treatment; had it been thoroughly analyzed and had the different makers of axles been consulted?

E. R. Hill, chairman of the committee, said that the sub-committee which had handled this matter in conjunction with the American Society for Testing Materials had endeavored to leave it as broad and open as possible to all manufacturers. The specification simply said that there should be a heat treatment and almost said "according to the standard practice of the various manufacturers." He did not see how it could be changed to let all the manufacturers in and make it more specific. The requirements as to chemical analysis and physical tests were clear and definite for the results wanted. The particular methods and processes of heat treatment were left to the manufacturers.

Secretary Litchfield said he could say absolutely for the committee that the various manufacturers had been consulted. The specification which the engineers of the Interborough Rapid Transit Company drew up about two years ago for heat-treated axles specified directly what the heat treatment should be, but the company had departed from that specification and adopted the one recommended by this committee because the committee had found in consultation with steel makers that it would be practically impossible to get all the physical properties required on one test from each treating plant heat by any heat treatment that was not very thorough. In other words, the specification was telling the manufacturer that he must give the railway a physical and chemical test in say one axle out of twenty. While one might be able to get these physical properties occasionally, the manufacturers would agree that it could not be done as a regular thing on this number of tests, unless there was a greater and definite heat treatment. For the information of those who were not familiar with the proceedings of the American Society for Testing Materials he said that all of their committees on which the Engineering Association was represented by this sub-committee were formed half of manufacturers and half of consumers. This specification was sent out for letter-ballot by all of the members of the Testing Society, and it was adopted as their standard.

F. R. Phillips thought it was possible to get the physical requirements as specified in this report without heat treatment.

Mr. Palmer said that the specification came very near to being drawn upon the proper lines of a specification, whether referring to heat-treated axles or to any other subject. It fought shy, and rightly so, of prescribing any manufacturing processes. The specification simply named the performance which the material under consideration should give and named the tests which would determine whether or not that performance was secure.

Secretary Litchfield asked some makers' representatives to state whether Mr. Phillips was correct in saying that the physical properties prescribed in the specification could be obtained consistently without heat treatment.

H. P. Tieman, Carnegie Steel Company, did not believe that these physical properties could be obtained without heat treatment and very careful heat treatment at that.

George E. Thackery, Cambria Steel Company, agreed with Mr. Tieman that it was ordinarily impossible to obtain the qualities set forth in these specifications without heat treatment. There might, however, be an occasional heat that would almost come within the limits of physical requirements, but this could not be obtained regularly in practice. In addition to giving the physical properties in the test according to specification, the heat treatment went further than that in treating the axle as a whole, so that it was as uniform as possible throughout.

Henry Gulick, Gulick-Henderson Company, referred to the second clause as regards discard. He thought that, since this steel was intended for a very special purpose it should not be a hardship to require its identification. There should be something in these specifications as regarded the checking up or identification of steel. The phosphorus and steel content was given as "not over 0.05 per cent." That surely should be reduced. It should not be over 0.04 per cent for both phosphorus and sulphur. The tensile test should be selected from the location of the wheel fit and not at the direct-cropped end, because that direct-cropped end got a part of the heat, and it was not a fair and true representation of conditions at the point where the axles really break. This test would require an extra axle for each lot to be tested.

D. F. Kenney, Cambria Steel Company, said that the reason for letting phosphorus and sulphur go to 0.05 per cent was that some of the manufacturers make acid steel and some basic steel. The limitation of phosphorus and sulphur under 0.05 per cent would be very much of a hardship in acid steel.

Mr. Tieman said with regard to taking a test around a wheel fit that the directions for making the test were that it should be cut half-way between the center and the outside. The test specimen of an axle, say 5.5-in. at the journal, would be approximately 5 in. long, which would put the center of that specimen 2.5 in. from the center of the axle, whereas measuring it from the side it would be 1.5 in., showing it was further to the end of the axle than it was to the side. He thought this answered the question regarding the treatment at the end rather than further down.

On motion the meeting then adjourned.

JOINT DISCUSSION OF BLOCK SIGNAL REPORT BY ENGINEERING AND T. & T. ASSOCIATIONS

The joint session of the Engineering and Transportation & Traffic Associations was held in the Greek Temple. Presidents Page and Harvie presided.

J. M. Waldron, chairman, and C. D. Emmons, vice-chairman, of the committee on block signals, abstracted the report. Mr. Waldron explained that the committee had not reported on the cost of signal installations or maintenance and that these would be treated in future studies. The two-fold purpose for which signals were installed was the protection of the public and the increase of earning power for a given trackage.

H. S. Balliet, signal engineer New York Central Electric Zone, had carefully studied the paper and complimented the committee very highly on the thoroughness of its work. The subject in hand was among the hardest to be handled because it was new. Mr. Balliet recommended that all the associations interested in signaling work approve as standard the upper quadrant position for semaphore blades, and then if the steam and electric signal men could not agree the steam men could use the upper right-hand quadrant and the electric men the upper left-hand quadrant. The speaker told of his experience with light indications. For open work he would use semaphores. In the Park Avenue tunnel, however, his company operated light signals with success. This tunnel had four tracks and the two outer tracks were quite

dark, so that the light signals could easily be read for 2500 ft., the length of two blocks, when illuminated with 3-cp, 55-volt lamps. The center tracks were not so dark and it was difficult on these to locate light signals properly unless they had more powerful lamps and lenses than were used on the dark tracks. Accordingly 8-in. lenses and 16-cp candle-shaped lamps were used. These signals, with light indications only, had been operated successfully since November, 1906, under most exacting conditions. Mr. Balliet thought that the development of signals with light indications was very possible for interurban service. It avoided the use of signal-operating mechanisms and lamp signals required little maintenance. After all, no matter how much was spent for signals, those which were maintained the best gave the best service. Mr. Balliet said that in the appendices A, B, C and G the interurban railway men would find an excellent outline for an up-to-date signal system. The information there was valuable for both transportation men and engineers.

L. E. Gould, Western editor *ELECTRIC RAILWAY JOURNAL*, was requested to speak from the viewpoint of the public. It had been his observation that the patrons of those interurban roads which had signal installations appreciated them very highly. The public felt that the signals had been installed primarily as safeguards and therefore took greater interest in them than would be taken, for example, in a change in the motive-power equipment.

John Roberts, signal engineer New York, Westchester & Boston, said that the greatest hindrance to signaling work had been its cost. The problem of the signal engineer was to give sufficient protection and come within the appropriations.

W. K. Howe, chief engineer General Railway Signal Company, hoped that the interurban roads would adopt some definite system of signaling and not get into the condition existing on the steam roads due to each having required a variety of apparatus designed for a single service. Regarding light signals, Mr. Howe said that much could be done to insure keeping the lamps burning. The arrangement used on the New Haven road was to put one lamp in the focal center of the lens and another behind it. If the first lamp went out, the second lamp was lit automatically. With the second lamp the indication was not so brilliant, but it was sufficient for a signal. This plan was not wasteful, because only one lamp was burned at one time.

G. W. Palmer, Jr., Bay State Street Railway Company, viewed the signal question from the standpoint of the power distribution engineer. Signals primarily were needed by the transportation department, which should outline its requirements fully, and after these had been determined upon it was the duty of the engineer to provide the indications and signal service needed. He felt that light signals were not so good as semaphores. He said that many roads were interested in the first and second recommendations of the committee, that is for signaling on slow single-track service.

C. D. Emmons, Chicago, South Bend & Northern Indiana Railway, expressed the thanks of the signal committee for the assistance given it by the manufacturers.

L. F. Howard, electrical engineer Union Switch & Signal Company, noted with pleasure that the signal problem had been thought worthy of a joint session. He felt that light signals in some cases would prove more satisfactory than semaphores. The usual colonnade poles alongside an interurban track formed a background which was better for displaying a light signal than a semaphore signal in so far as visibility was concerned.

Charles Morrison, signal engineer New York, New Haven & Hartford Railroad, New York, said that the subject of signals should be considered of great importance. He favored the use of semaphores where possible, and believed that a standard design could be had which would be applicable to both suburban and interurban roads. The circuits should be designed very carefully to provide against crossed wires giving a false proceed indication. The par-

ticular design of signal did not affect the question of maintenance. The most expensive and complicated signal system is not any better than the cheapest unless it is properly maintained. The New Haven railroad had adopted the center suspended arm for its entire system as the result of its first installation on the electrified sections where the signals were supported beneath catenary bridges close to the 11,000-volt trolley wires. This form of signal arm has also been used on the direct-current trolley lines with satisfaction. Mr. Morrison described the automatic arrangement for cutting in a second signal lamp when the first had burned out. The signal system on the New Haven road between Woodlawn and Stamford, about 20 route miles, required the capacity of a 130-kw generator for operating the signals, lamps and track circuits. The Harlem branch, a six-track line, now being electrified, would require 100-kw generator for its signaling system.

H. M. Sperry, General Railway Signal Company, asked that a discussion be had on the proper methods for signaling single-track lines. That was a very important problem.

H. W. Griffin held that the continuous track circuit was very necessary and that light signals might be used properly in many instances. The arrangement of single-track signals was very important and had been discussed at considerable length in the committee report.

President Harvie called attention to the value of joint committees on subjects of common interest to the two associations. Mr. Waldron closed the discussion by emphasizing the need for thorough engineering work in connection with signaling practice. A system of signals should be chosen which would not only lend itself to ample protection for present traffic but would be capable of expansion without the necessity for scrapping material originally installed. In discussing light signals the present high-power lenses should not be confused with the old-style colored window glass lens.

The meeting then adjourned.

TUESDAY MEETINGS OF TRANSPORTATION & TRAFFIC ASSOCIATION

President Page called the meeting to order at 10 a.m.

Before the report of the interurban rules was presented I. H. McEwen, Oneida Railway, Utica, made a motion that the report be referred back to the committee; that the membership of the committee be increased to fifteen members, at least three of whom should be members who had had at least one year's experience in operating under the American Railway Association's standard code of rules; that the committee appoint a secretary to be selected by the chairman of the committee, and that the committee should issue advance copies of its report not later than Jan. 1, 1912. In explaining his motion Mr. McEwen said that he did not wish to be understood as intending to be discourteous toward the committee, as he thought that the committee had done a splendid piece of work. He had not seen a copy of the report until about ten days ago, and he had had an opportunity of going over only about eighteen or twenty pages of it. He had found, however, many points on which he could not agree with the conclusions of the committee. He thought that there were many other members who probably had reached the same conclusion, and for this reason he believed it would be unwise for the convention to go on record at this time as approving the report as presented.

At the suggestion of J. N. Shannahan, J. G. White & Company, Mr. McEwen withdrew his motion in order to permit the report to be presented and discussed.

Alexander Shane, Indianapolis, Columbus & Southern Traction Company, then presented the report of the committee. Since the report was printed the committee had received written criticisms from thirty-nine members. These criticisms had been carefully considered by the committee, and in presenting its report the committee wished to make the following changes:

In proposed Rule No. 95, insert Section K of old Rule No. 99. Many companies thought it was very desirable to retain the answer to the signal of a train displaying signals for a following section.

Proposed Rule No. 98 was amended by substituting the bell signals given in old Rule No. 103. These signals corresponded to the signals used in city operation.

Old Rule No. 209, referring to extra trains clearing the time of regular trains, was restored in the code. The committee in its report had eliminated this rule.

Mr. Shane said that the committee had no apology to make in submitting its report. The members of the committee had used their best efforts to present a code of rules of such character that it could be used as a basis for compiling operating rules by member companies. The committee was not unanimous in its conclusions on many points, but the minority members had given way to the majority members on the committee and each of the members had signed the report. He thought that the subject ought now to be brought to a close. There were now and always would be differences of opinion, and he thought that if the committee had to go over the work again it would make some changes.

Charles L. Henry, Indianapolis & Cincinnati Traction Company, said that he did not wish to express any opinion as to the details of the rules as presented, but he wished to mention one point which was uppermost in his mind. At the Denver convention in 1909 a code of rules was adopted by the association. The committee had worked on this code of rules for two years and had made only a few changes which were unimportant in character. He thought the strongest argument in favor of the adoption of the rules was that the committee had found it necessary to make so few changes. In Indiana the interurban roads had been discussing the question of rules with the State Railroad Commission for more than two years, and the code of rules which was finally adopted for use by companies operating in that State was very similar to the code presented by the committee. He anticipated in the near future some action on the question of rules for interurban roads by the Interstate Commerce Commission. He thought that it was most important that the interurban companies should place themselves on record as to what they thought was a proper code of rules. With reference to Mr. McEwen's suggestion that the report be laid over for another year, he thought that the delegates would come to the convention next year no more in readiness to discuss the details of the rules than they were at the present time.

On motion of C. Loomis Allen, Utica & Mohawk Valley Railway, it was decided to discuss the changes in the Denver code which had been recommended by the committee. These changes were considered one by one in the order in which they appeared in the report.

C. D. Emmons, Chicago, South Bend & Northern Indiana Railroad, suggested that old Rule No. 11 be substituted for proposed Rule No. 8, which refers to the responsibility of employees examining cars for defects before taking them out on the road.

F. W. Coen, Lake Shore Electric Railway, pointed out that in the State of Ohio a very rigid employers' liability law was in force which required companies to post notices of this kind in order to escape liability. The rule would be a valuable one in that State.

Alexander Shane said that the committee had been advised on this rule by the best legal talent that could be obtained, and he thought the rule should stay in.

A motion was made to substitute Rule No. 11 in place of proposed Rule No. 8, but it was lost.

C. D. Emmons moved that the original separation of old Rules Nos. 85 and 84, which had been combined into proposed Rule No. 71, be retained. The motion was lost. Mr. Emmons also moved that the words "above or alongside" be replaced by the word "near" in proposed Rule 74. The motion was lost.

Mr. Emmons then moved that in proposed Rule No. 113 the words "in addition" be inserted before the words "a yellow light," so as to provide for both a flag and a lamp at night and avoid any danger during the transition from daylight to darkness. The motion was carried.

Alexander Shane moved that the last clause of old Rule No. 130, which reads "but giving no proceed signal," be added to proposed Rule No. 148. The Indiana Railroad Commission had recommended that this clause be added. The motion was carried.

C. D. Emmons moved that the words "nor without proper signal from the conductor" be added to proposed Rule No. 163. The motion was carried. With reference to proposed Rule No. 158, Mr. Emmons also moved that the words "after executing all train orders" be added to the second sentence. The motion was carried. Mr. Emmons then moved that old Rule No. 361 be substituted for proposed new Rule No. 180, on the ground that it afforded greater safety. The motion was carried.

C. Loomis Allen then presented the following resolution: "Whereas the standing committee appointed by this association has prepared and reported changes to the standard code of rules governing the operation of electric interurban cars, which code is intended to include such general rules as represent the best and most modern practice in electric railway operation, and

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

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

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

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

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

The resolution was adopted.

A recess of five minutes was then taken while the members of the Engineering Association entered the hall for the joint meeting on "block signals."

FRONT DOOR FARE COLLECTION IN KANSAS CITY

The Metropolitan Street Railway Company of Kansas City decreases the rush-hour loading time of cars in the congested business district by stationing men on the street close to the front ends of the prepayment type cars so that passengers may be admitted through the exits and the fares collected before they enter. This is a system inaugurated some time ago which James E. Gibson, general superintendent, says has proved to be of much advantage to the road. Previous to the adoption of this plan it was found almost impossible to induce people to move up to the front of the cars, and during rush-hour service this inertia of the passengers handicapped the service by limiting the standing load.

ACCOUNTANTS' "GET TOGETHER" LUNCHEON

The annual "get together" luncheon of the Accountants' Association was held yesterday in the Chevy Chase room at the Marlborough-Blenheim Hotel. The practice in previous years has been to have a few informal responses to toasts. This plan was continued this year, but it was amplified by the addition of an informal talk by M. R. Boylan, general auditor of the Public Service Railway of Newark, N. J., on the subject "Prepayment Fare Accounting."

After the cigars had been passed President Forse spoke of the presentation last winter on behalf of the association of a silver cup to W. F. Ham, comptroller of the Washington Railway & Electric Company. This was given in recognition of the valuable services performed by Mr. Ham throughout a number of years for the Accountants' Association. President Forse called on Mr. Ham, who expressed his feeling at the spirit that prompted the present and his appreciation of the act.

Remarks were made at the request of the chairman by H. J. Davies, Robert N. Wallis, F. E. Smith, Elmer M. White, P. S. Young, A. H. Morrow and Prof. M. E. Cooley.

Mr. Boylan in discussing the subject of prepayment fare accounting said in part:

"I want to make one point as emphatic as I can, and that is that there should be no further delay in the completion of a system of prepayment fare accounting which will be at once simple, economical and satisfactory. In my judgment, the railway accountants have no more serious problem confronting them than this, nor can they render any greater service than the preparation of a suitable plan which will be as nearly uniform as local conditions will permit.

"The first requirement to insure a safe delivery to the company of fares collected on prepayment cars is the installation of a satisfactory fare-box. Prepayment cars as equipped with gates, doors and other safety devices have helped to keep down the number of accidents, but without the use of proper fare-boxes they do not return the value which it is intended they should in the way of increasing revenue. While the company is assured of the collection of fares from all passengers it is necessary to adopt suitable means of guaranteeing that full returns be made by the conductor. After experiments which have covered a period of three years, and included about every type of fare-box that has been on the market in that time, I have been convinced that the registering fare-box, supplemented by the use of a register in the car, offers the basis of the most scientific method of accounting yet tried.

"Last year I told of our company's experience with the four compartment locked box, which was in use at that time. We have since tried a single compartment box and find it more satisfactory than the four compartment type. It is more easily handled; it prevents the confusion of returns as between conductors and it simplifies the checking of cash receipts in the accounting department. The value of this latter advantage is that it means a saving in the cost of accounting.

"In the use of single compartment boxes, when a conductor is assigned to a run and receipts for the cash he gets to use as change, he is also given one of the fare-boxes which contains a movable receptacle for cash fares. This box is used by the conductor throughout the entire day. The conductor, at the beginning of his run, deposits an identification slip showing the fare-box number, cash box number, run number, etc., this card being similar to one outlined in the 1910 report. When the conductor is relieved, either temporarily or after finishing his day's work, he removes the fare-box from the car and delivers it to the receiver or clerk at the carhouse. When a conductor has completed his day's work the cash receptacle is removed from the fare-box by the receiver and is replaced with an empty one. The cash receptacles are locked in crates and

forwarded to the cashier, as outlined in the case of four compartment boxes in the 1910 report. On regular runs a conductor receives the same fare box each day. This reduces to a minimum the cost of repairs, as conductors learn to feel a personal responsibility for the care of the box.

"Just as the single compartment box has an advantage over the four compartment box, so has the registering fare box a distinct advantage over the locked box. To begin with, a proper registering fare box would render unnecessary the impounding of a large amount of ready cash to be supplied to conductors in the form of change. On the larger systems this item alone is important. The registering fare box would enable the conductor to get at his receipts for purposes of making change, but not until after the fares had been recorded. The car register would act as a check on the fare box returns and could be utilized for tickets and transfers where they are used.

"Again, with the conductor using up the small change, the making of returns at the end of his run would be simplified, as he would have currency and coins of the larger denominations, rather than nickels and dimes. The counting and handling of this money would not be as expensive as is the locked box system.

"But before registering fare boxes can be generally adopted, it must be demonstrated that they are accurate and reliable. We have encountered trouble of various kinds. The principal objection has been that the boxes become clogged or their operation retarded by mutilated coins or slugs. Progress has been made, and if it has not been as rapid as some of us would like to see, we must admit that there is a valid reason.

"Looking the facts squarely in the face, it would seem that the manufacturers have been handicapped, or, at least, not encouraged, by virtue of the fact that no two street railway systems handle their fare collections in the same manner, and that practically no two systems have agreed, up to the present time, on any one design of fare-box as standard. If any two or more systems accept boxes of the same design, they operate the boxes differently. Some companies insist that a fare box shall be a combined cash register and car register. Others want a fare box simply as a cash register working in conjunction with the register inside of the car. Others use the fare box as a cash register without any register inside of the car. Still others insist on trip registers and registers for three cent fares on boxes. Some want fare boxes equipped with a register for transfers.

"This situation can only result in slower progress in improvements than would be the case if all companies would decide on a standard method of operation. Some one of the foregoing designs is the best for all companies. I believe that the system that we are following, of using the fare box as a cash register and ringing up all fares on the register inside of the car, is the most practical system, and if a discussion of this matter would lead to the adoption of a uniform system, it would tend to more rapid progress in fare box manufacture, and the manufacture of far better fare boxes, as improvements could be made gradually on a standard design."

After the completion of Mr. Boylan's talk on this subject there was a general discussion in which the following participated: J. H. Neal, F. E. Smith, Thomas Kilfoyle, F. Dabney, Robert J. Clark, James Adkins, W. F. Ham, Robert Morrison, Jr., and Will Browne.

During the year 1910, the Zurich (Switzerland) Municipal Railway installed tea sets at its shop and at all carhouses. Tea is provided for its employees without cost. The management states in its annual report that this service has lessened the use of alcoholic liquors among the men. Every carhouse is also provided with two free bathrooms fitted with shower equipments.

CITY TRACK PRACTICES IN GREAT BRITAIN

At the tenth annual conference of the Municipal Tramways Association, held in Glasgow, Sept. 27-29, three reports on way matters were presented by James Grierson, Henry Mattinson and Robert B. Holt, permanent way engineers of the Glasgow, Manchester and Leeds tramways respectively. These reports were comments upon an association data sheet which had been answered by over sixty undertakings. The following is a summary of the three papers.

The British standard rail sections are widely used, but there is a general feeling that the standard of chemical composition should be raised. Mr. Holt suggested that since most, if not all, tramway rails tended to wear convex on the tread, the tread ought to be made convex to begin with, thereby preventing much irregular wear of wheel tires and rails and reducing energy consumption. The only alloy steel used is the Sandberg silicon rail, of which over 30,000 tons have been rolled in England for tramway systems alone. Three systems gave a 33 per cent reduction in wear for this rail as compared with ordinary basic bessemer. While these rails were not free from corrugation markings, the latter did not develop as in ordinary rails. It was recommended that other alloys like chrome, nickel, tungsten and titanium should also be given a trial.

Most companies use solid manganese steel for switches and crossings. Thirty-two companies reported that the wear on manganese steel exposed a honeycomb structure in the castings. One important disadvantage of manganese steel tongues was their tendency to bend more readily than forged steel and to acquire a permanent set because their elastic limit is low.

The authors recommended the adoption of standard switches for specific purposes, such as turnouts, crossovers, junctions and carhouse layouts. Manchester has established standard switches and also prepared templates for all switch parts, so that, for instance, a tongue from any switch is interchangeable with another of the same type. In Glasgow, where the radii of turnouts vary from 30 ft. to 490 ft., there has been no difficulty in satisfying this range of conditions with two sizes only—a 12-ft., 100-ft. radius switch and a 14 ft., 200-ft. radius switch. Many companies now build their sharp curves to template before laying them.

The thermit joint is widely used on the larger systems. In Manchester some 7000 of these joints have been laid within the past five years and the breakage has been less than 3 per cent. In Leeds, where 11,000 joints have been laid within the past eight years, breakages have been reduced from 3 per cent to 0.7 per cent, due to wider experience and better methods of application. It has been found in Leeds that the average conductivity of a thermit welded joint is 8.75 per cent lower than the rail itself, thereby showing that while the bonding is not absolutely necessary, it does increase the conductivity. Experiments on welds with 14-in. bonds showed that the conductivity of the joint with the bond is 4.3 per cent better than the rail itself.

The general method of removing corrugation is to employ abrasive blocks, which are fitted into track brakes, or to use grinding machines. Mr. Grierson had found corrugations develop on new track after running for three months. These were removed by scrubbing blocks and did not reappear for four years. He was using motor-driven rotary grinding wheels running at 900 r. p. m. and geared to travel along the rails at 8 ft. per minute.

Mr. Mattison employs the oxy-acetylene blow-pipe for renewing dished or cupped rail. The welding plant was compact and inexpensive, while little disturbance of the roadway was necessary. The new steel is fused into the rail by the blow-pipe, hammered during the process and a slight excess fused in. The surface is then ground and filled even and continuous. Some 100 joints which were renewed in Manchester late in 1910 and early in 1911 are a success.

THE INTERURBAN*

BY CHARLES L. HENRY, PRESIDENT INDIANAPOLIS & CINCINNATI
TRACTION COMPANY

The questions incident to transportation have during all ages presented very difficult problems for solution.

In the early days these questions were narrow and more simple in their character. There is no doubt that as soon as man first experienced the desire to get away from home, either for war or in peaceful pursuits, he discovered that transportation upon the waters, both rivers and seas, furnished him with the best opportunity, and this he used for visiting his neighbors, transporting food and other commodities, and spying out new lands. The winds of heaven wafted his ships into foreign seas and the commerce of the nations increased and multiplied to vast proportions.

Until the first decade of the present century, although inventive minds were reaching out for new means of propulsion, only the winds had been harnessed for use. Then, however, steam began to be used in navigation, and its use was so rapidly developed that the present year is to witness a centennial celebration of the opening of the Ohio River to steam navigation.

The use of steam power for navigation upon water soon led inventors in a quest for some mode to use it for transportation upon land. It was not, however, until the year 1830 that they were successful. In that year the first commercial steam railroad was put into operation in England, from Liverpool to Manchester.

The steam railroad transportation field remained unaffected by any suggestion of the use of any other motive power until the year 1883. In September, 1883, there was opened the first practical commercial electric railroad, in the north of Ireland, running from Portrush to the Giants' Causeway, a distance of about eight miles, under the direction of Siemen, the world-renowned electrical engineer. The road was built upon the highway. The electric current was generated by water-power and was delivered to the cars from a third-rail. This third-rail remained in use until about 1897, when the highway commissioners, on account of the numerous accidents caused by the third-rail, ordered its removal and the substitution therefor of the overhead trolley.

No sooner had the first crude apparatus for the propulsion of cars by electricity been put in use than it was seen that electricity was very desirable for the operation of street railroad lines in cities and towns, and it was not long until the horse car and cable car commenced giving way to the electric car. In February, 1888, the first commercial electric street railroad in the United States was put in operation in the city of Richmond, Va., under the direction of Sprague, one of the great American pioneer electrical engineers. The equipment of city lines with electricity increased so rapidly that it was only a few years until no cable car was to be seen and the horse car was almost a thing of the past.

By natural development these electric lines in the cities were gradually extended into the country for suburban purposes, and next came the idea of connecting city with city and the interurban came into existence, distinct and separate from the steam railroad on the one hand and the electric city line on the other. The name given to this new kind of railroad so correctly described it that it has now become worldwide in its application. The first interurban roads were built in northern Ohio, and, curiously enough, the initial letters in the names of the cities connected by one of them, Akron, Bedford and Cleveland, were A, B, C, truly indicating that it was the beginning, as the first letters in the alphabet are to the school child the

beginning of his education. The building of these roads increased year by year until all the important cities and towns, especially in this country, have been connected by interurbans.

GROWTH OF INTERURBANS

At first, both in the building and operation of the interurban, the plans and practices which had been adopted and grown up in the building and operation of the city lines were, very naturally, adopted, and the roads were built upon the country highways as if they were to be in fact only an extension of the city lines. They were limited also exclusively to the carrying of passengers, no provision even being made for the passengers' baggage. The fares were based upon the 5-cent street railroad idea, and whenever a passenger was carried farther than the company thought it ought to carry him for 5 cents the conductor went through the car and collected another 5-cent fare, and this was repeated, section by section, until at the end of his journey the passenger would have paid as many 5-cent fares as the distance traveled was divided up into 5-cent sections. The cars were of light construction, though somewhat heavier and larger than the ordinary city cars; the trucks carried motors of much the same capacity provided for the city cars, and the speed attained was about the same. These interurban cars at once attracted great attention and became very popular with the public, and the patronage with which they were favored was much greater than had been estimated by those instrumental in their building. The cars ran at frequent intervals, which was at once recognized as a great convenience; there was no smoke, as upon the steam railroads, and the stops, both in town and country, were arranged at proper intervals to accommodate the public. The people were attracted to them and their use became at once general.

Soon, however, it became evident that the ideas controlling in the construction, equipment and operation of the first interurbans were too narrow and that they must be widened and broadened in order to make this new means of travel meet the requirements of the public. Private rights-of-way must be secured and the tracks removed from the highways, wherever possible, to avoid interference with and inconvenience from the ordinary highway traffic. Otherwise the requisite high speed could not be attained. The cars must be larger and more commodious, provided with all conveniences, including provision for the carrying of heavy baggage. They must be built in such a substantial way as to make them secure for higher speed, which, in turn, required that the electric motor equipment must be increased. The electric current, which at first was furnished by power stations at short distances from each other, or transmitted from a "booster," by means of a feed wire, allowing for the necessary drop in voltage, must be distributed from a central power station over high-tension wires to various substations at which the voltage would be reduced and fed into the trolley wires. A very rapid development ensued, until to-day upon the best interurban railroads of the country are found cars of practically the same size, capacity and construction as the best steam railroad coaches, equipped in some instances with motors of more than 400-hp capacity to the car, running across the country on private rights-of-way, on tracks which compare favorably with the best railroad construction, and making speed equal to the fastest railroad trains, in some instances at a schedule speed, for country running, of approximately 60 miles per hour. Instead of the collection of a 5-cent fare at each 5-cent section, through tickets are sold, good not only over the company's own road but also over connecting lines.

This rapid development and change has from time to time brought the managers of the interurban roads face to face with the most serious problems. The entire situation is changed. In the beginning it was but natural that estimates as to the character and cost of construction, the fixing and

*Abstract of an address made before the American Electric Railway Association, Atlantic City, N. J., Oct. 9-13, 1911.

collection of fares and the arrangements for operation should be controlled by the ideas regarding like questions in connection with city lines; but the requirements under the new era of development were entirely different. Expensive equipment for air brakes must take the place of the simple but insufficient hand brake; headlights must be provided, extending the motormen's range of vision at night to a safe distance ahead; the old 40-lb. rail track must be replaced by heavier rails; a perfected telephone system, for the use of the dispatcher, must be developed; the cast-iron wheel must be taken from the trucks, and in place thereof there must be substituted a steel-tired or steel-rolled wheel. These and many other things called for increased expenditures in construction and operation and caused the heads of the managers to roll upon their pillows in sleepless hours of the night. It appeared, and it was in the beginning, sufficient to provide hand-operated signals from one switch to another on a single track, so that a north-bound car could not enter a section while a south-bound car occupied it, even though it occasioned a delay of ten or fifteen minutes in waiting at a siding, and it was not thought out of the way to delay a few minutes to enable a belated farmer, coming across the fields, to reach a stopping point. But the old ways have been completely changed. Bridges of light construction have been and are being replaced by those strong enough to carry an ordinary steam railroad train. Tracks laid with 70-lb. to 90-lb. rail upon standard cross ties are used. Dispatchers are maintained for the operation of the cars, their hours of service being limited by the Interstate Commerce Commission to eight hours per day. The cars themselves are heated by hot-water systems, and even now the legislatures and railroad commissions of the various states are requiring the installation of the block signal system. All this makes the cost of construction and equipment of interurban roads threefold or fourfold what was originally anticipated, and the cost of operation has been very greatly increased. Skill is required in the operation of the cars. Track men are constantly employed in keeping up the tracks; overhead linemen, at high wages, are kept busy all the time.

INCREASED BURDENS

Coupled with and added to this increased cost of construction and operation are many burdens growing out of the changed condition of the public mind. In many towns it is now thought to be the proper thing to object to the running of freight cars along the streets, although the idea has never occurred to prevent the hauling of freight in open wagons over these thoroughfares, or the driving through them of droves of cattle and hogs that may stray upon the adjacent lawns, and are indeed a nuisance. Even in many towns of insignificant size the interurban will no longer be permitted to load and unload baggage, express and freight matter in the public streets, although the baggage wagon, the express wagon, the wagon from the farm or the truck from the store or factory is, without comment, permitted and expected to do this. The interurban, it is urged, must provide waiting rooms, with expensive toilets, baggage rooms, express offices, freight houses, in the heart of the city or town, all at great expense. In some cities and towns—I now recall one of less than 1200 inhabitants—it has been deemed wiser to require the interurban car, that may be carrying three score of passengers, to come to a full stop before crossing one of the principal streets, rather than to ask the cigarette-smoking speed fiend or the simpering thirteen-year-old high-school girl to slow up his or her automobile enough to avoid danger. Notwithstanding that teamsters of all classes and kinds use all parts of the streets without charge or compensation of any kind, the interurban must be required to pave the streets between its tracks and out to the ends of its ties and to maintain this paving at its own expense; waiting-rooms or shelter stations must be constructed at all stopping points in the country; the fare must be limited by statute law to 2 cents per mile, so that a

passenger pays no more for his ride upon an interurban car from city to city than a few years ago he paid for the privilege of driving his own horse and buggy over a toll macadam road the same number of miles. A passenger not only rides upon the car at this low rate of fare, but the company must in addition carry free of charge along with him 150 lb. of baggage, and if, perchance, a lady passenger's trunk is lost, although it is carried free, the company receiving not a cent therefor, it must make good in damages the value of the trunk and of all the beautiful dresses contained therein. In some of the states it is an accomplished fact, and in others a threatened one, that the interurban must also pay to an employee who is injured in working for the company the damages sustained by him, even when it is clearly shown that the carelessness and negligence of the employee himself was the sole cause of the injury. Laws of this class alone have been the cause of an increase of from 50 per cent to 100 per cent in the cost of liability insurance.

In the early development of the steam railroads the cost of labor was one-half what it is at the present time. Rights-of-way were given free and donations in addition were made to secure location of the roads. Cross-ties could be secured without any expense beyond the cutting and hauling, the present cost being 80 cents per tie. Rails cost \$18 per ton as against \$28 at this time, and all other expenditures were likewise lower in amount. Notwithstanding all this the steam railroads were permitted to charge during their early days 4, 5 and in some cases 6 cents per mile for the carrying of passengers, and the charge for the transportation of freight was many times greater than now. Remembering all this, it indeed seems strange that the public should expect the interurban to bear all of this increased cost of construction and operation at a time when the purchasing power of money has decreased one-half, and yet only be permitted to charge 2 cents per mile for the carrying of passengers and the same low freight and express rates as are now charged by the steam railroads after their full development.

The problem for the future before the interurban is indeed great, and to many it would seem that its solution must be similar to the answer which the boy gave in school to the problem in arithmetic stated by mistake on the part of the teacher as follows: "If a frog is in a well 15 ft. deep and jumps up 2 ft. at night and falls back 3 ft. in the daytime how long will it take him to get out?" The boy covered both sides of his slate with figures and then, calling the teacher, said: "You did not say how long the frog has been doing this, but if he has been doing it very long he must be in hell by this time."

However, those engaged in the building and operation of interurban railroads have been and still are undaunted and look into the future without flinching. Understanding as they do that the cost both of construction and operation cannot be materially reduced and that many additional things will arise from time to time to increase this cost, they are looking to the development of the business and the increase of receipts, and the changing of public sentiment by proper educational means, so that the burdens placed upon them by reason of public clamor may be removed to lead them out of the desert and into the promised land.

RELATIONS WITH THE PUBLIC

First of all, it is important that public officials and the public at large shall be made to understand clearly that it is unfair to place burden after burden upon the interurbans. They are, indeed, as they were in the beginning, the people's roads, furnishing them at comparatively insignificant cost with conveniences which they could not otherwise get. This idea must be brought back and strengthened in their minds, and they must be shown that the people cannot have the conveniences furnished by the interurban at such insignificant cost if burden after burden is to be piled

upon the companies, increasing the expense for construction and operation—for, after all, the consumer must pay the cost or the interurban cannot exist. Let the public be educated to the point where it shall be understood that the interurban is not to be a subject of prey on the part of public officials, but is to be favored and helped, to the end that the people may, even at the present reduced passenger fares and freight rates, receive the benefits thereof. Every means should be taken to educate all members of the community to assist in avoiding accidents. They should also be taught that where a person, whether a passenger or not, is injured he should not expect to recover anything from the company unless the company was at fault, and then only what is fair and reasonable compensation for the injury received.

In the matter of taxation they should again be taught the self-evident truth that, although the interurban is owned by a corporation, yet it is not morally honest or economically right that its property should be burdened with a higher tax than other property of the community, and that if any favors are to be shown they should rather be given to these companies which furnish to the people at large such desirable service at such low figures. All these things can be accomplished in large degree, if not entirely, by a proper and persistent plan for the education of the public, and that this shall be done interurban people owe not only to themselves but to the patrons whom they serve. By the means indicated a very material reduction, both in the cost of construction and operation, may be secured.

LONG-DISTANCE FIELD

While in the beginning there was no thought of the interurban entering into the field either for the transportation of freight or express or for long-distance passenger travel, it has become evident that all these fields are fertile for exploitation, both in the interest of the public and for the increased receipts from operation. Even now in some places through travel between large cities has been established and the passenger may purchase a through ticket between the two termini and check his baggage through, notwithstanding that the route of travel may carry him over two or more interurban railroads. The Central Electric Railway Association, composed of electric city and interurban railroads in the States of Indiana, Ohio, parts of Michigan, Pennsylvania and Kentucky, has made very great progress in this regard through its efficiently managed traffic association, and in other parts of the country the interurbans are doing likewise. This kind of interurban travel is being so rapidly developed that it is not too much to expect that in the near future the traveling public will prefer the interurbans for long-distance travel, the same as they have heretofore preferred them for short-distance travel. It is a matter of interest that the Illinois Traction System has put in use sleeping cars equipped with all the conveniences and comparing in every respect with the best Pullmans operated upon the steam railroads. These they are operating to and from the city of St. Louis. When the convenience of long-distance travel upon the interurbans on trains making few stops and running at high speed is added to the convenience of short-distance travel on slower trains making frequent stops it will be readily seen that the management of these roads may expect very largely increased passenger receipts.

EXPRESS AND FREIGHT

The express business, or expedited freight, carried on the passenger cars has been developed to such an extent that it furnishes a very handsome income, which gradually increases as the people get more accustomed to it and therefore dependent upon it. Being permitted to make these shipments on the cars, usually running every hour, the merchants and others are enabled to get extremely quick shipments and deliveries; and, combined with the use of the telephone, in many cases the farmer gets repairs for

his machinery in such a short time that while waiting he permits his team to stand in the field without unhitching. Some of the old-line express companies have seen the advantages of interurbans for express business, and on many roads they are carrying business the same as on steam roads. On account of the convenience and popularity of this business it is sure to grow to very large proportions and thus swell the interurban receipts.

As to the handling of freight on freight cars, it may be said that on many roads where it is carried but little beyond the extent of package business the receipts constitute from 10 to 15 per cent of the gross receipts, and on others, where the service has been broadened and extended, the receipts have been very materially increased. What has been learned by experience leads us to believe that, with a proper development of the handling of the freight business, what furnishes now an insignificant proportion of our receipts may be made to furnish a much larger proportion. We may not be able to reach the proportion of freight receipts which the reports of the steam railroads show, but this will not be necessary, for the passenger receipts of the interurbans promise almost certainly to exceed greatly the passenger receipts of the steam roads over the same territory. This extension of the freight business, we well know, cannot be brought about except by extending the facilities for the handling of freight, but if diligent attention is given to the matter, as it certainly will be, it is sure to demonstrate the fact that the increased expenditures occasioned thereby will bring greatly increased returns in the way of receipts.

On one road where the handling of a large amount of grain on a certain section in carload lots was deemed profitable it was found that if the grain was turned over to the steam roads in the cars furnished by the traction company, it was difficult and practically impossible to secure the return of the cars without long delay. The plan was adopted of transferring the grain from the interurban freight car to the steam road freight car at a conveniently constructed elevator, where the roads connect, and it has been found to work with entire satisfaction, the transfer being thus made at very little cost.

The comparatively recent development of the single-phase system and the high-trolley-voltage, direct-current system has greatly cleared the field from doubts as to the ability of interurbans to handle heavy freight, and a careful development and extension of the business are all that is necessary to bring large returns into the treasury of the interurbans.

THE MANAGER'S POSITION

In brief, then, the interurban manager must recognize that the cost of construction and the expense of operation have been and are being increased greatly beyond the expectation of those early in the business, and also that unless the public mind is educated to a different view of matters there are to be very greatly increased burdens added by legislation, national, state and municipal. Then, recognizing all this, he must go forward in the development of interurban business, extending it into the new fields, thus bringing to his company the greatly increased income which is needed. And, with it all, he must aid in educating the public mind along right lines, so that, while doing all it should rightly do, the interurban shall not be broken down and crushed by burdens that should not be placed upon it.

The accomplishments of the past are sufficient guarantees that the interurbans will, in the future even more than in the past, fill the place for which they are so well fitted in the great field of transportation, and that in so doing those who have shown their faith in them will be rewarded by fair returns on the capital invested.

Trolley bases in two styles with detachable pole feature, detachable trolley harps, and trolley wheels of various types and sizes, are being exhibited by the Bayonet Trolley Harp Company, Springfield, Ohio, at space 27.

REPORT OF THE JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS*

BY J. M. WALDRON, CHAIRMAN; C. D. EMMONS, VICE-CHAIRMAN;
JOHN ROSS, G. H. KELSAY, J. N. SHANNAHAN, J. T. WALLIS

The subjects here reported upon were assigned to committee members, as follows:

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|---|---|----------------|
| <ol style="list-style-type: none"> 1. Instruction from Association 2. Minutes of Meetings 3. Introductory Paragraph on Signals 4. Historical 5. Résumé of Data Sheets 6. Necessity for Electric Railway Signals—C. D. Emmons. 7. Digest of State and Interstate Commission Rulings and Laws—J. N. Shannahan. 8. Block Signals to be Installed During 1911—John Ross. 9. Conclusions and Recommendations for 1912 Committee—C. D. Emmons. | } | J. M. Waldron. |
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Appendices.—Abstracts of Descriptions of Apparatus Furnished by Signal Manufacturers—G. H. Kelsay, assisted by L. E. Gould, Western editor of the ELECTRIC RAILWAY JOURNAL.

Your committee in preparing the report thought best to collect such data as would be of benefit to the member companies for educational purposes and in this development the committee has at all times been in close touch with the work of the Block Signal & Train Control Board of the Interstate Commerce Commission and with the various committees of the American Railway Signal Association.

THE BLOCK SYSTEM OF RAILROAD OPERATION

The block system of railroad operation reduced to its simplest terms means that each train is forbidden to pass a certain point, forming the entrance to a block, until the last preceding train on the same track has passed beyond a certain point farther on, forming the end of the block. No train enters a block section except and until its motor-man sees on the signal post or train order board a "Safety" or "Proceed" signal. Protection from butting collisions on single track lines depends upon the exercise on the part of motor runners and train crews of intelligent and unremitting vigilance in the observance and execution of intricate rules and written orders and on the exercise of the utmost care by the train dispatcher. By far the greater part of the mileage of railways in the United States and Canada is single track, and to this there has been added in the last few years a rapidly increasing mileage of electric interurban roads, which, in their operating conditions, present problems similar in character to those of the single track steam lines, but which from the nature of their traffic, make even more imperative adequate means of safeguarding train movements.

According to the most authentic statistics at hand there were on January 1, 1911, block signals in use on 71,268 miles of railroad, of which 17,711 were protected by automatic signals and 53,557 by non-automatic signals, or practically three miles equipped with non-automatic signals to every mile equipped with the automatic or track circuit type.

The interurban railway has lagged behind the steam railway in the matter of signaling and control of cars or train units. It is now becoming apparent, however, that in this branch of operation of interurban roads as now developed the necessity for adequate control is urgent. This is due to the distinctive lines on which interurban railway traffic has been developed, bringing to the front problems of its own differing widely from those encountered on steam railway lines.

The relative necessity for communicating with train crews on electric railways as compared with steam roads cannot be based on track mileage, for the reason that for a given number of miles the electric road will operate three or four times as many train units as the steam road under ordinary conditions, while on holidays and special occasions the electric road traffic will be greatly increased.

EARLY ELECTRIC RAILWAY SIGNALING INEFFECTIVE

The use of some type of protective signals is not new with electric railways, but unfortunately many signals which have been used have not been up to the standard governing steam railway practice either in mechanical construction or reliability of operation.

The application of automatic block signals to electric railways presents no greater difficulties from either the mechanical or electrical standpoint, although there are many important factors entering into the problem which are not inherent in steam railway practice. The traffic is dense in comparison with steam roads and it is carried on comparatively short sections of single track line, with frequent stops, in combination with the operation of through express train units, at certain intervals of the day, without the assistance of station agents or other employees at meeting points or stops, to control the traffic. These factors, together with the increased holiday traffic previously mentioned, require for their control a system of signals designed especially to meet these conditions.

THE NECESSITY FOR ELECTRIC RAILWAY SIGNALS

The safety of the public who are our patrons and from whom we derive the revenue which sustains us provides the first necessity for signals. This developed the early and still much used system of establishing what are commonly known as "hand blocks" whereby a trainman of a car at one siding, by throwing a switch by hand, turns on a light at the next siding, signifying to a car at that point that he intends to proceed to that siding.

After the safety of the passenger is assured, the next necessity for signaling is to get the passenger to his destination as promptly as possible. In keeping the cars moving promptly and properly an obvious result is the increased capacity of a track or system which has been properly signaled. The signaling, while adding to the capacity of a given system, is of great value in reducing the liability to accidents and increasing the confidence of the public.

The requisites of signals on electric railways vary naturally, with many conditions. Each system has its own problem and the keynote of the solution lies in the answer to the question "What is necessary for the protection and safety of the public under the conditions under which we operate?"

DIGEST OF LAWS AND RULINGS

A digest of laws compelling the installation of block signals on electric railways, and of laws conferring the necessary authority upon the various commissions to require electric railways to install block signals, and of the various rulings made by the different commissions on this subject, occupied five pages of this report.

Congress does not appear to have conferred upon the Interstate Commerce Commission any authority to compel either steam or electric railways to install block signals.

The following states have no laws or commission rulings bearing on the subject of block signals: Alabama, Arizona, California, Connecticut, Georgia, Iowa, Kansas, Missouri, Montana, Nebraska, North Dakota, Ohio, Rhode Island, Tennessee, and Virginia. The commissions in Florida and South Carolina have no jurisdiction over electric railways, and in Pennsylvania none in so far as block signaling is concerned. In Maryland, Massachusetts, Minnesota, New York, Nevada, Oklahoma, Oregon and South Dakota the legislature appears to have conferred upon the railroad or public service commissions the authority to require the in-

*Abstract of report read before the American Electric Railway Engineering and Transportation & Traffic Associations, at Atlantic City, N. J., Oct. 9-13, 1911.

stallation of block signals, but in none of these states has any ruling as yet been promulgated requiring such installation. In Wisconsin during the last session of the legislature there was enacted a law which appears to confer upon the railroad commission of that State explicit and definite authority to require railroads to install and operate a block system in such cases as the commission decides that it is necessary so to do in order to render the operation of such railroad reasonably safe.

In Indiana, during the last session of the legislature, a law was enacted by which it is provided that after January 1, 1912, it shall be unlawful for any company owning or operating a line of steam or interurban railroad in Indiana to operate any train or car over such railroad "unless such railroad is equipped with and has in operation an automatic block system or other system approved by the Railroad Commission of Indiana for the control of train or car movements thereon, unless the time therefor be extended by such Railroad Commission."

There have been no rulings of the commission under this act which have any relation to electric railroads. A committee on block signaling has, however, been appointed by the commission from representatives of the interurban companies, with M. H. Hovey, of Madison, Wis., the block signal expert of the commission, also a member.

SIGNALS TO BE INSTALLED DURING 1911

The collection of data concerning block signals that the various electric railway companies contemplate installing during the year 1911 has brought out very forcibly the timeliness and importance of the appointment of a committee for the investigation of this subject.

Among the companies actually putting block signals into use the Illinois Traction System is making the largest installation. This company has already in place and on order 168 Union Switch & Signal Company's style B automatic block signals, to be operated in connection with continuous track circuits, protecting about 150 miles of track. It also has on order 50 Nachod trolley contactor signals, which will be installed on various parts of the system. These will protect about 25 miles of track, making a total of 175 miles of track protected by signals. The Nachod signals will be used where city service is operating over interurban lines and at the entrance to towns.

The Public Service Railway Company of Newark, N. J., already has a system of 160 blocks and this year has placed an order with the United States Electric Signal Company for 121 more, making a total of 281 blocks, and taking care of 81 miles of track.

The Hudson Valley Railway Company is using the trolley contact device of the United States Electric Signal Company and intends protecting this year 5 more miles of track with this company's type K signals, the average length of block being three-fourths of a mile.

The Wheeling (West Va.) Traction Company contemplates protecting 45 miles of track with the trolley contact device. This company is testing four blocks on one line equipped with Nachod signals and one block on another line with the United States signals. If these signals prove satisfactory, all of this company's single track lines will be immediately equipped. The block signals are used only at turnouts.

The Worcester Consolidated Street Railway Company intends protecting about 25 miles of track with the United States Signal Company's type G trolley contact device, using an average length of block of about 2 miles.

The Chattanooga Railway & Light Company intends protecting about 4 miles of track with the Nachod signals. In this case the average length of block is about 3,000 feet.

The Elmira & Seneca Lake Traction Company will add one more block of 2 miles to its present system of United States electric signals.

The Hudson & Manhattan Railroad Company proposes this current year to add to its present system of the Union Switch

& Signal Company's automatic electro-pneumatic signals by installing signals at nine locations on about 6,000 feet of track.

The Boston Elevated Railway Company intends increasing its present system of electro-pneumatic signals so as to protect 3 miles of double track.

The Syracuse, Lake Shore & Northern Railroad Company is preparing to install six signals, covering a distance of about 10½ miles of single track, on an extension. These signals will be of the a. c. continuous track circuit type, manufactured by the Union Switch & Signal Company, and similar to twenty-four others at present in use on double track.

The Syracuse, Lake Shore & Northern Railroad Company is preparing to install six signals, covering a distance of about 10½ miles of single track, on an extension. These signals will be of the a. c. continuous track circuit type, manufactured by the Union Switch & Signal Company, and similar to twenty-four others at present in use on double track. This company is also installing on the Rochester, Syracuse & Eastern Railroad nine of the same type of signals, covering a distance of about 16½ miles.

The Boston & Worcester Street Railway Company intends installing this year signals distributed over 31½ miles of main-line double track. The blocks vary in length from 1,400 feet to 3,200 feet and are in most cases independent of each other. The reason for the use of short blocks is that the operating department finds it necessary to operate double headers on close headway. The blocks are located in those places where there is the most danger of collisions due to curves; etc. This company uses the O'Bryan signal.

The Ohio & Southern Traction Company is intending to protect 7½ miles of track with the Stromberg-Carlson dispatchers' signals.

The Oregon Electric Railway is planning to protect seven miles of track with three-position automatic continuous track circuit signals.

The Washington & Rockville Railway Company and the City & Suburban Railway Company, of Washington, D. C., intend protecting 2.84 miles with a controlled manual system of signals of the Ramsey type, made in their own shops.

The General Railway Signal Company is now installing two sample blocks for the Lehigh Valley Transit Company. This company contemplates protecting 60 miles of track this year.

The Waterloo, Cedar Falls & Northern Railway Company expects to protect eight or ten curves this year with block signals, probably of the alternating-current track circuit type.

The Michigan United Railway Company also has been investigating a number of a. c. track circuit signal systems recently but reports that the matter is not sufficiently far advanced to give definite information.

The Cedar Rapids & Iowa City Railway is planning to protect 25 miles of track, but has not determined what system to adopt.

The Roanoke Railway & Light Company is planning to protect 10 miles of track, the system not yet decided upon.

CONCLUSIONS AND RECOMMENDATIONS FOR 1912 COMMITTEE

There can hardly be any question as to the fact that each road presents its own problem, possibilities, requirements and limitations. Manifestly, a small road earning scarcely enough to pay its operating expenses cannot make or hope for any expenditures for signals, yet the road which earns a large revenue per mile of track, with business that at times taxes its capacity to the utmost, must of necessity make large expenditures in the installation, operation and maintenance of signal systems. The signal companies are working to develop signals which will take care of the different phases of this subject as presented by different properties.

Because of this being the first year's work of your committee on signals, and because of the rapid development of new apparatus and methods of signaling at this time, we do not feel it wise now to report any definite conclusions, but recom-

mend that your committee for the year 1912 continue the study of the present and ever-increasing number of signal systems, and, if possible, at the end of that year's work, draw some conclusions and make signaling recommendations for the following classes of roads:

	No. of tracks	Headway in minutes	Speed in m. p. h.
A—	1	5 to 30	20 or less
B—	1	1 to 10	30 or less
C—	1	60 or more	40 to 60
D—	2	5	40 to 60
E—	2	5	40 to 60

*Trains of several sections.

BLOCK SIGNAL SYSTEMS—APPENDIX

The appendix to the signal report is a collection of material largely obtained from the engineers of signal manufacturing companies. This material occupies 106 pages of the report and is illustrated by seventy-five engravings.

Appendix A defines the various systems of blocking and describes and illustrates the continuous track circuit system.

The fundamental principles of control circuits are presented in Appendix B, showing how particular care must be taken in making signal connections to assure that any derangement of apparatus or wires will give a "stop" indication.

Appendix C, occupying eighteen pages of the report, presents by means of illustrations and detail descriptions typical signaling plans for electric railways and shows the common method of diagramming signals on plans. This section of the appendix also includes a critical statement by the Union Switch and Signal Company of signaling with auxiliary indications for reduced speed following movements.

Appendix D is a statement of the General Railway Signal Company favorable to the "absolute permissive" block system.

Appendix E describes light signals as developed for sub-way and interurban use.

Appendix F describes automatic train stops, referring particularly to those in use on the lines of the Washington Water Power Company at Spokane and the "Key Route" at Oakland, Cal.

Appendix G consists of brief descriptions of the more essential parts of a block signal installation, describing briefly the relays and signal mechanisms.

Appendix H is an illustrated description of the automatic block signal system on the Illinois Traction System written by John Leisenring, signal engineer, for the *ELECTRIC RAILWAY JOURNAL* of June 24, 1911.

Appendix I is a description of the automatic block signals and train stops on the Washington Water Power interurban line, abstracted from an article in the *ELECTRIC RAILWAY JOURNAL* for December 17, 1910, material for which was furnished by R. M. Willson, assistant general manager.

Appendix J describes the Kinsman block system using short track setting sections.

Appendix K describes the Nachod signal system and its trolley contactors.

DISPATCHERS' SIGNAL SYSTEMS

Appendix L is devoted to dispatchers' signal systems and presents illustrations and descriptions of the dispatchers' signals manufactured by the following companies: Blake Signal & Manufacturing Company, General Railway Signal Company, Western Electric Company, Baird Electric Company, Stromberg-Carlson Telephone Manufacturing Company, National Electrical Manufacturing Company and the United States Electric Company. This concludes with an illustrated description of the Simmen dispatching system as manufactured by the Railway Improvement Company, New York, and the Prentice automatic train stop and cab signal which has been the subject of experiments on the Canadian Pacific Railway.

REPORT OF THE COMMITTEE ON CAR MILES AND CAR HOURS*

CHAS. H. LAHR, CHAIRMAN; M. W. GLOVER AND C. S. MITCHELL

A car mile is a mile run, whether it be by a small single-truck city car, an urban or an interurban car of different length or weight. Whatever revenue is collected for this distance constitutes the earnings per car mile and the expense incurred is the operating expense per car mile.

The car mile is used at the present time almost universally as the unit of comparison. In the operation of a traction property its statistics are very valuable as a means of giving information relative to its operating condition or general efficiency, but to stop there is to miss the greatest good of the statistical work. Comparisons of one property with another have always been unsatisfactory and always will be as long as the interests in control are indifferent as to the methods used in compiling these statistics.

It is the opinion of your committee that mileage should be computed for each car operated, even though several cars may be operated in trains and some may be motor cars and some trailers. This mileage should include all mileage run from the time the car leaves the carhouse or terminal until it reaches its regular starting point, and all mileage made during the day's operation and return to the terminal.

DIVISION OF CAR MILES

Car miles should be divided into two classes, namely, revenue miles and non-revenue miles. These may be subdivided as desired. Revenue car miles should be divided into two classes: First, cars used in passenger and chartered car service and, second, cars used in freight, express and mail service. Non-revenue car miles are miles run by cars while being transferred from one point to another for the purpose of repair and transfer; also miles run by cars used in the service of the company, the expense of which is chargeable to the company itself, including work, sand, sprinkling and wrecking cars, snow sweepers and plows.

DIVISION OF CAR HOURS

When car hours are used as a unit of comparison they should be divided into two classes, namely: Revenue and non-revenue. These may be subdivided as desired, but to obtain the best results they should be compiled like car miles, that is, the entire time that the trainmen are in charge of the car from the time of leaving terminal or carhouse until return should be included, and the time of each car operated should be included in the computations, whether such cars are operated in trains or separately. The data for compilation of car miles and car hours should be furnished by the operating department by report of the schedule trips of each line or division for the day. If any additional trips are made or any trips lost the carhouse foreman or dispatcher should report the same.

We believe that many economies can be effected if the management has accurate statistics of the car miles and car hours compiled under the above plan. The lines are closely drawn between the miles run and the hours in service of cars operated for revenue and the miles run and the hours in service of cars operated for non-revenue purposes. The data may be readily segregated in a manner that will permit the cost per car mile and per car hour for various classes of service to be ascertained as may be desired.

It is the opinion of your committee that for comparative purposes the car mile and car hour are not entirely satisfactory as units on account of the different weights and capacity of cars, but with the limited time in which the committee had to prepare its report it was impossible to communicate with the member companies and secure their opinions along this line.

*Abstract of a paper read before the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 9-13, 1911.

REPORT OF THE COMMITTEE ON INTERLINE ACCOUNTING*

L. T. HIXSON, CHAIRMAN; IRWIN FULLERTON AND E. L. SCHMOCK

Your committee on interline accounting desires to offer some recommendations which the previous committees have not taken up, as well as to suggest several methods differing somewhat from the recommendations of former committees.

We also desire to submit a system of accounting for interline business which may be of assistance to the accounting officers of a company entering this class of business.

TICKET REPORT AND INTERCHANGEABLE COUPONS

The form of ticket report recommended by the 1909 committee has proved very satisfactory, and the forms as shown herein cover very slight changes.

The bill for coupons accepted should be accompanied by a statement in duplicate giving the book number and the opening and closing number of the coupons.

BAGGAGE REPORT AND FREIGHT ACCOUNTS

Separate reports should be made covering baggage, taking the place of the combined baggage and ticket report.

While the greater number of electric lines have been using the "unit" type way-bill for interline business there seems to be a growing preference for the "blanket" bill. When the blanket bill is used train crews and junction agents have fewer bills to handle and can check freight with greater speed and accuracy. A number of lines also interchange business with steam roads and boat lines and must use blanket bills for such traffic. The blanket way-bill eliminates, to a great extent, the difficulty arising from lost way-bills.

It has been the custom to make settlement for interline business in a variety of ways, thereby causing considerable confusion. One plan should be made compulsory for all interested companies.

RECOMMENDATIONS

Your committee desires, therefore, to make the following recommendations:

Reports of ticket accounts to be made by the selling road not later than the fifteenth day of the following month.

Bill to be rendered by the company accepting interchangeable coupons not later than the fifteenth day of the following month and to be accompanied by a statement showing book numbers and opening and closing numbers of each strip of mileage or coupons.

Report to be made by the company checking baggage to all lines interested. In making corrections on reports from another line use correction blank, inserting the word "baggage" where necessary.

In lieu of the different names and colors of baggage checks generally used we suggest that free checks be white card, designated "free;" revenue checks which are prepaid, red card, designated "prepaid," and checks for revenue or advances to be collected at destination, blue card, marked "collect."

In the audit office settlement of the "blanket" form of way-bill to be used. All bills covering freight received by a company during the month to be reported not later than the fifteenth day of the following month to the company on whose lines the shipments originated, as well as to all intermediate lines over which such shipments were hauled. Reports to be made as follows: Abstracts, division sheets and summary.

In addition to these regular monthly reports the following are used when necessary:

STATEMENT OF DIFFERENCES

Advising the line making the original report of errors in such reports. This form is not used for unreported way-bills.

*Abstract of paper read before the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 9-13, 1911.

For all items listed on statement of differences, which a company accepts, a correction account is issued and taken into account in the summary the following month.

Accounts should be settled in accordance with reports as rendered and corrections adjusted the following month, except for any large errors or errors caused by carrying footing forward, which should be corrected with advice to the reporting company at once.

Corrections on way-bills should be taken into account in the month they are received and accepted (regardless of the date of the original way-bill) by entry on abstract instead of the correction account, which is used by some companies. These corrections may be noted on the abstract and added or deducted, as the case may be. This method greatly facilitates the adjustment of the account.

PASSING RECORD

All freight passing junction should be entered on this form, which may be used by the auditor to check up billing

WESTERN TRACTION COMPANY
ACCOUNTING DEPARTMENT

ABSTRACT OF WAY BILLS FOR FREIGHT RECEIVED

FROM: *Ohio Traction* COMPANY
VIA: *Richmond* JUNCTION, MONTH OF: *June* 1911

WAY BILL DATE	NO.	BILLED FROM	BILLED TO	WEIGHT	FREIGHT	ADVANCES	PREPAID
<i>June 13 1911</i>		<i>Springfield, O</i>	<i>Annapolis</i>	<i>300</i>	<i>75</i>		
<i>7 13 11</i>				<i>1200</i>	<i>360</i>		<i>360</i>
<i>9 13 11</i>				<i>150</i>	<i>45</i>		
<i>70 13 11</i>				<i>450</i>	<i>488</i>	<i>75</i>	
				<i>3600</i>	<i>968</i>	<i>75</i>	<i>360</i>

Interline Accounting—Way-Bill Abstract

from or to foreign lines. This form is also useful in case of claim in determining the condition of a shipment when delivered to or received from a foreign line.

All unreported way-bills or statements of difference which have not been accepted are carried as "unadjusted accounts." This list may be made in any form, as it is a memorandum for the use of the road making it.

BALANCING LOCAL AND INTERLINE FREIGHT ACCOUNTS

The total interline forwarded by a company, added to the total received, as shown by agents' abstracts, must equal the total interline received by such company added to the total forwarded, as shown by agency abstracts. This balance is made before commencing the regular interline settlement sheet and covers the current month only.

All freight accounts from the various sources are entered on the interline freight settlement sheet and the balances for all agents, as well as each company, are shown. The "unadjusted accounts" totals for the previous month are de-

WESTERN TRACTION COMPANY No. *310*

CHICAGO, ILL., *July 26 1911*

PAY TO THE ORDER OF *National Bank*

Review and \$ *31.00* DOLLARS. \$ *7.22*

FOR BALANCE ACCOUNT, PER MARGINAL STATEMENT

To *Ohio Traction Co*
Springfield, O

D. J. Lee
TREASURER

Interline Accounting—Settlement Draft

ducted and totals for the current month are added. If the proper figures have been taken into account the advances received and forwarded will check, and the prepaid received and forwarded will also balance. The amount of foreign roads' proportion of revenue deducted from the total revenue freight column will give the net freight earnings of the company, and this amount, carried to the credit in the "balance" column, will make the total debit and credit footing the same.

There are very few electric lines interchanging equipment to any great extent, and those lines which are interchanging do so principally with steam roads, and follow steam road practice. Therefore, the committee does not wish to offer any suggestions as to handling this class of business.

As soon as all entries have been made for the month, a statement of interline account should be rendered to each road, giving the debits and credits as shown by the company's books in order that duplicate reports may be requested at once, if any should be missing.

All settlements should be made by draft for the balance of the account, including all classes of interline business. Such draft should be made by the creditor company at any

WESTERN TRACTION COMPANY

AUDITOR'S OFFICE

CHICAGO, ILL. *July 16, 1911*

STATEMENT OF INTERLINE ACCOUNT WITH

Ohio Traction COMPANY

Springfield, Ohio

MONTH OF *June*, 1911

	DR.	CR.
Tickets	208 30	1 86 85
Baggage	4 20	3 65
C. E. T. A. Coupons	5 51	3 40
Freight		26 58
Per Diem	9 86	
Bal. Due <i>W. Traction Co.</i>		7 39
	227 87	227 87

Interline Accounting—Monthly Statement

time after the twenty-fifth day of the following month, and should cover the items as set forth in the interline statement.

A condensed form of journal entry will answer the requirements in the majority of cases, but the manner of keeping each company's books differs and this entry would conform of necessity to the regular practice.

CONCLUSION

In conclusion the committee wishes to state that the forms and outline submitted herewith are intended to cover one way of handling interline accounts from the time the ticket or way-bill is issued until the entry is made on the general ledger. While there are other plans which will give the same final results, we are of the opinion that the system recommended is the most satisfactory.

The McConway & Torley Company, of Pittsburgh, Pa., has in its exhibit a full-size Janney radial coupler applied to the framing of a car platform. This coupler is of the same pattern as that used on many thousand steam railroad cars, with arrangement for radial movement to provide for the service requirements on electric interurban cars. The method of attachment is the acme of simplicity. It couples automatically by impact, and can be uncoupled from either side of the car. This company was the originator of the M. C. B. type of coupler, and its reputation in the coupler field is assurance of its ability to cope successfully with the problem of evolving an efficient and practicable device for interurban service. The use of this equipment makes possible the interchange of cars with steam roads. The company's engineering department will be glad to cooperate with railroad officials or car builders in designing equipment for special conditions.

REPORT OF COMMITTEE ON HEAVY ELECTRIC TRACTION*

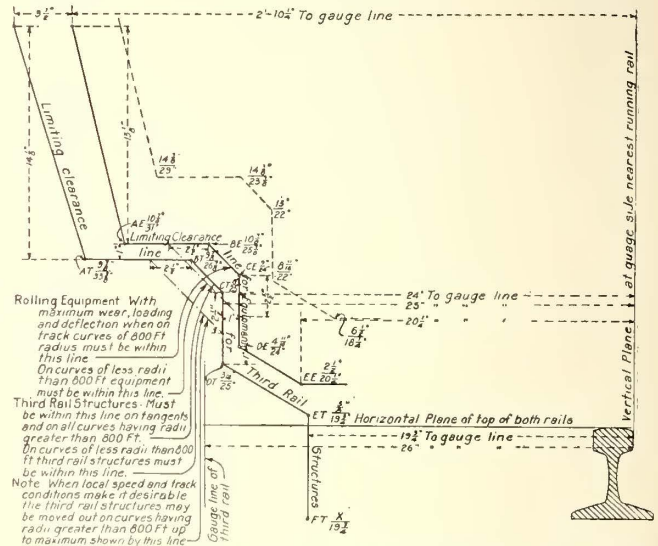
BY E. R. HILL, CHAIRMAN; E. B. KATTE, VICE-CHAIRMAN; W. S. MURRAY, J. H. DAVIS, HUGH HAZELTON, E. F. GOULD

The committee confined its consideration to the following subjects:

1. The location and clearances for third-rail working conductors.
2. The location of electrical end connections on cars and locomotives.
3. The location of automatic train stops.

THIRD-RAIL LOCATION AND CLEARANCES

Your committee arranged for conferences with representatives of the corresponding committees of the American



Heavy Traction—Limiting Clearance Lines for Third-Rail Structures and Equipment

Railway Association and the American Railway Engineering Association, and as a result has prepared a diagram showing location and clearance lines which we understand will be satisfactory to the committees of those associations.

It has been thought advisable, however, to confine our attention at this time to the establishment of such standard location and clearance lines as affect the relation of the third-rail construction to rolling equipment, and leave for subsequent consideration such standard location and clearance lines as affect the relation of the third rail to permanent way structures. The committee recommends that the committee on heavy electric traction next year take up the question of permanent way construction lines as bearing upon the space required for the installation of third-rail working conductors, with the view to recommending a standard which shall be satisfactory to the committees of the three associations.

The committee recommends that the following standards be adopted by the American Electric Railway Engineering Association:

- (1.) The gage line of the third rail to be located not less than 26 in. and not more than 27 in. from the gage line of the track, and the contact surface of the third rail to be not less than 2 3/4 in. nor more than 3 1/2 in. above the plane of the top of the track rail.
- (2.) The clearance lines for third-rail structures and rolling equipments to be as shown in the accompanying diagram.
- (3.) Encroachments on normal clearance due to deflection of springs and wear vary with the type of construction used and the practice of the respective roads as regards permissible wear and deflection before repairs and adjust-

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

ments are made. For the general guidance of the roads in designing equipment, but not as a standard, therefore, a dotted line is shown on the diagram located 2 in. distant horizontally and 4 in. distant vertically from the limiting clearance line for equipment.

Attention is called to the method of designating the points of the lines in the diagram, as follows:

(a) The letter "T" after a letter indicates that the line refers to the third-rail structure.

(b) The letter "E" after a letter indicates that the line refers to equipment.

(c) The figures after designating letters represent, respectively, the elevation in inches above the plane of track rail when shown above the line, and the distance in inches along the plane of track rails from the nearest gage line of track when shown below the line.

The committee further recommends the adoption of the following terms, which have already been adopted by the American Railway Engineering Association (American Railway Engineering & Maintenance of Way Association):

(1.) Third-rail gage. Distance measured parallel to plane of the top of both running rails, between gage line of running rails and gage line of third rail.

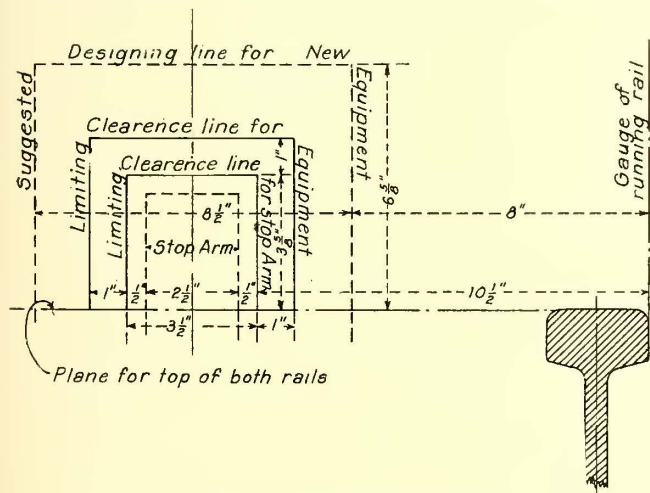
(2.) Bond. A metallic means for connecting two rails to permit of the passage of electric current.

ELECTRICAL END CONNECTIONS ON CARS

Considerable data have been collected with special reference to heavy electric traction on steam railroads. However, as the committee on equipment has also been considering this subject, the data have been turned over to that committee. It is important for all roads to adopt as far as possible the M.C.B. standards for location of mechanical and hose connections, but, in view of the wide variation in practice regarding electrical connections, it will probably be impossible, at least for a considerable time to come, to adopt a definite standard for each type of connection. It would seem feasible, however, to define certain space at the ends of cars, to be used in electric service either at once or at some future time, which space should be reserved for the location of end connections at the time the cars are designed and built.

LOCATION OF AUTOMATIC TRAIN STOPS

The use of automatic train stops actuated in connection with the signal system is coming more and more to be the



Heavy Traction—Recommended Clearance Lines for Automatic Train Stops

practice, especially on electric railways operating in subways and tunnels, and the committee deems it advisable at this time to make certain suggestions regarding the proper location of trip arms along the track and contact devices on cars which may be regarded as "recommended practice," until such time as the use of train stops becomes sufficiently general to justify the adoption of a standard location.

We offer the clearance line shown as defining the space which should be reserved along the track and on the equipment for the use of the train stop. The location is the same as adopted for the station and tunnels of the Pennsylvania Railroad at New York and for the Hudson & Manhattan Railroad Tunnels.

STANDARD AXLE SPECIFICATIONS

A sub-committee was appointed jointly representing the committee on equipment and the committee on heavy electric traction, consisting of J. S. Doyle, superintendent car equipment Interborough Rapid Transit Company; John Lindall, superintendent rolling stock and shops Boston Elevated Railway; Hugh Hazelton, electrical engineer Hudson & Manhattan Railroad. This sub-committee has held several meetings as part of committee A-1 of the American Society for Testing Materials on standard specifications for steel.

As a result there have been drawn up specifications for heat-treated carbon steel axles, shafts and similar parts. These specifications have been sent to all members of the American Society for Testing Materials with a view to adoption as standard of that society.

THE NEW YORK AIR BRAKE COMPANY'S DISPLAY

The New York Air Brake Company has in operation in Marine Hall, spaces 229-231, an electro-pneumatic air-brake equipment for a ten-car train. This equipment has been designed for use on electrically operated trains of any length, being especially adapted for multiple-unit service. The special features of this equipment are simultaneous service, graduated release, maintenance of cylinder pressure against leakage and regardless of piston travel, simplicity of operation and manipulation, service emergency, quick recharge and high pressure emergency. An instantaneous application occurs in both service and emergency when operating electrically.

The brakes may be graduated on or off to any extent, to offer the greatest flexibility of operation obtainable. The brake cylinder pressure is automatically maintained against leakage and regardless of piston travel in both pneumatic and electric operation. An interruption of electric current on one or more cars in the train will not affect prompt application when the brakes on the rest of the train are operated electrically. All electric and pneumatic positions on the motorman's valve are the same, so that in case the electric current fails the pneumatic will immediately apply when the motorman's valve handle is placed in application position, resulting in no loss of time due to the necessity of moving the valve handle to another position. As the lap position is common for both electric and pneumatic operation the brakes will not release should the current be interrupted after the brakes have been applied electrically. This insures a positive brake upon trains from starting when held applied on grades, etc. In the graduated release position the system is completely recharged after an electric application. Any number of consecutive service applications can be made, after which, if an emergency should arise, the maximum cylinder pressure can be obtained instantaneously. An emergency application can be obtained electrically or pneumatically on all cars after any service application has been made. Only one type of equipment is necessary for all different weights of cars. Should a conductor's valve or track trip be opened an instantaneous emergency application will be produced. An emergency application produces a higher maximum brake cylinder pressure than is obtained in a full service application. The company representatives in attendance are W. T. Henry, N. A. Campbell, C. E. Leach, J. D. Cartin, B. J. Minnier, H. E. Whitaker.

A very extensive line of wire rope and fittings and bare and insulated wire and cables is being exhibited by the John A. Roebling's Sons Company, in space 225-9.

ACCOUNTING SYSTEM FOR A SMALL ELECTRIC RAILWAY*

BY E. D. GAULT, AUDITOR MAHONING & SHENANGO RAILWAY AND LIGHT COMPANY

A great deal depends on the office as well as the equipment provided. The office should be well ventilated and illuminated, as well as large enough to provide ample space for filing away all records. While some companies seem to think that almost any room or set of rooms not needed for other purposes will do for an office, other companies are beginning to provide better accommodations for those employed to keep track of the business transactions of the company.

It is the exception to find all the information gathered by the different departments collected in one place. There should be one place for gathering together all the information relative to the financial and all other records pertaining to the construction and operation of any company, and this should be in the accounting office. All contracts and valuable papers should be filed in this department and when taken for use in any other department a proper record should be made.

The classification of "expenditures for road and equipment" adopted as standard by this association on Oct. 15, 1908, and conforming to the classification prescribed by the Interstate Commerce Commission, should be used. We are also asked the cost of certain buildings, power houses, substations, bridges, etc., especially in arriving at valuations for insurance purposes, and for this reason the cost of each individual job should be kept. Before work is started on a particular job a work order should be prepared giving a description of the work and the estimated cost. This should be approved by the proper officials and sent to the accounting department to receive a distinguishing number. A record should be kept known as "charges to work orders," in loose-leaf form. A description of the work to be done should be written at the head of each sheet, and also the estimated cost together with the work order number given by the accounting department. The sheets are ruled with four columns to the right so that all charges may be segregated as between labor, material and miscellaneous, the last column being used for the total. A report should be made up each month showing all expenditures on each job.

In addition a record should be kept known as "expenditures for road and equipment." This may also be a loose-leaf form and the same form of ruled sheets may be used as those used in the record of work orders. At the head of each sheet should appear the account number and the name of the account. The total of the entries each month will equal the total of the entries "charges to work orders."

A column should be provided in the voucher record headed "expenditures for road and equipment." The total only should be entered in the voucher record under the above heading and the detail with reference to the classification should be entered in the record of "expenditures for road and equipment," while the amounts chargeable to the various work order numbers should be entered in the record of "charges to work orders." If it is desirable, instead of having one column in the voucher record headed, "expenditures for road and equipment" three columns may be used, as follows: I—"Expenditures for roads," II—"Expenditures for equipment," III—"General expenditures." At the end of each month the totals of these columns should be posted to the respective controlling accounts in the general ledger.

Time slips for labor in connection with construction expenditures should be of a different color from those used in con-

nection with operation, and should be sufficiently large to permit a written description of the work.

If it is not desired to keep job costs, the record known as "charges to work orders" may be omitted. It has been the writer's experience, however, that too little attention is paid to job costs. This information is of great assistance in placing insurance valuations, valuations for taxation, etc.

Without job costs, while we may be able to tell the cost of the property as a whole, or any particular class of property indicated by the classification of accounts, we cannot tell the cost of any particular building or of machinery and installation thereof. This is very valuable information, especially if the same officials are in charge of operation and construction, and unless this cost has been kept at the time the work is done we can come no closer than an estimate.

The other books used in connection with the construction accounts and for recording the transactions before operation are the general ledger, general cash book, journal voucher record, trial balance book, etc. These books should be large enough and ruled in such a manner that transactions with reference to operation may be recorded in the same books. This, however, is possible only when the company does its own construction work.

GENERAL LEDGER AND JOURNAL

The general ledger should be a bound book with regular ledger rulings on a good quality of paper and in a substantial binder. The accounts should be arranged systematically so that the balance sheet and statement of the income account may be prepared with minimum labor.

A large number of the accounts are termed "controlling accounts." These are the accounts presented in more detailed form in some subsidiary account.

The journal should be a bound book of the same size and style as the general ledger, except the ruling, which, of course, should be the usual journal ruling. There are certain transactions which cannot be recorded properly through other records, such as giving or receiving of notes, adjustment of general ledger accounts, closing entries, etc. These entries are made in the journal. The entries in the journal are likely to receive special attention in case of an examination of the books, and it is, therefore, quite important that these entries cover all the facts in connection with the transactions.

The tendency of to-day is to shorten work in every manner possible by doing as much posting directly from the books of original entries as can be done. Some companies use what may be called a journal voucher. Other companies have special columns ruled in their voucher record for transactions covered by journal voucher, and all the journal vouchers are entered in the voucher record each month, and the totals of the columns posted to the general ledger account.

The method of entering journal vouchers in the voucher record works out satisfactorily and saves labor as well as space in the general ledger.

CASH BOOK AND TRIAL BALANCE BOOK

The cash book should be a bound book of the same size and style as the journal and general ledger. While with a large property it might be best to have a book ruled with special columns and printed headings, for a small property this has not been found necessary. The system outlined in this paper contemplates the payment of all money by voucher, and, therefore, it is not necessary to have special ruling on the credit side of the cash book. On the debit or receipt side, the total of all cash received would be entered, and the posting would be made directly to the general ledger.

The trial balance should be made up from the general ledger each month. The balance of open accounts should be used rather than the footings. Many good forms of trial balance books may be found carried in stock at almost any good stationery house, and, therefore, it is not necessary

*Abstract of paper read before the American Electric Railway Accountants' Association, Atlantic City, N. J., Oct. 9-13, 1911.

to go to the expense of having a book made. The treasurer's and auditor's monthly reports should be made from the trial balance of the general ledger.

ACCOUNTS PAYABLE LEDGER AND VOUCHER RECORD

Many accountants look at the accounts payable ledger as unnecessary, but many concede that it is a wiser policy to keep a ledger account with each person with whom we do business.

The accounts payable sub-ledger can be utilized to show many valuable points of information, such as voucher number. In checking statements it saves much time in hunting up vouchers or records. I also believe that every company owes sufficient attention to the creditors to keep a separate account with each. Properly handled this acts as a safeguard against duplicate payments. It also gives quick information as to the amount of purchases from any given person during a given period. This ledger should be a loose-leaf ledger and regular stock sheets may be used without any inconvenience. While the accounts payable ledger is not necessary to the operation of the system herein outlined, it has been the writer's experience in the last few years that it has saved more time than it has cost to keep it.

The voucher record should be a bound book with printed headings. The writer's experience with voucher records made up in loose-leaf form has not been as satisfactory as with voucher records made up in bound form.

The following are the principal printed headings of a voucher record for a company using the standard classification of accounts: Voucher number. Name. Paid by. Check number. Amount of voucher. Way and structure. Equipment. Traffic. Conducting transportation. General and miscellaneous. Insurance. Insurance advanced. Taxes. Taxes accrued. Interest on bonds. Interest on bonds accrued. Interest on notes and accounts. Interest on notes and accounts accrued. Dividends on stock. Expenses on real estate not used in operation. Improvements. Railway supplies. Park maintenance. Park operation. Park general. Sundry accounts. Construction.

Several columns should be provided in addition to those with printed headings, so that additional accounts may be added in case this is desired. The voucher record provides the skeleton of consecutive general ledger headings or classification groupings that would appear on the monthly statement or balance sheet, but the "abstract of expenditures" supplies the detail of each classified account.

While it is only necessary to provide one column for construction charges in the voucher record, if it is desired three columns may be provided as follows: I. Road. II. Equipment. III. General expenditures. These columns would carry the total construction expenditures, but the record of "expenditures for road and equipment" described above supplies the detail of each classified account.

ABSTRACT OF EXPENDITURES AND VOUCHERS

The abstract of expenditures is a loose-leaf book with two sets of covers, one for active material and one for a transfer. The sheets are ruled on both sides, with four columns to the right, headed, "labor," "material," "miscellaneous" and "total." The same form may be used as that used for "expenditures for road and equipment," and also the same used for "charges to work orders."

Now it seems to the writer that no one can criticize a record of expenditures for either construction or operation which will take care of expenditures running from hundreds to millions of dollars. The grouping of the sheets is of the same order given in the voucher record. The operating expense statements are made up from this record each month. These statements are provided with columns for labor, material, miscellaneous and total. In this one book you have a complete classification of all your accounts, no matter how many, and you have labor, material and miscellaneous sepa-

rated. You also have an opportunity of comparing the showing of any one month with any other month of any year. You are enabled to make an analysis of any account for any period without the necessity of hunting up your vouchers. Furthermore, any number of clerks can be utilized in collecting and tabulating information at any one time, as the record is a loose-leaf record and may be separated.

The face of the voucher should show the distribution of the various accounts. When there is any considerable amount of distribution on any one voucher, as in the case of pay-rolls, a separate schedule may be attached giving the distribution.

Each conductor should be provided with a form of report or trip sheet for a record of the movements of his car and fares collected. The essential information that should be shown is the starting time, the direction of each trip, the register readings, car number, register number, conductor's number and motorman's number. Also a column should be provided in which the conductor might indicate the turning point of each trip, for this information is important if the car mileage and car hours are determined from the conductor's trip card.

This trip sheet should be turned in each day together with the cash collected. The next day the trip sheets are checked with the record of the register readings and the extensions are verified.

The cash is deposited by the receiver each day and a duplicate deposit slip properly initialed by the bank is attached to the receiver's daily report, and this together with the tickets, transfers, etc., is sent to the auditing department, where the returns are re-checked and the trip sheets verified. A record is kept with each car showing the number of miles run each day and the total at the end of each month.

Some companies make settlements of damage or personal injuries claims from a special reserve fund, setting aside each month in a separate account a certain percentage of the operating revenues. Payments are made from this account for the settlement of all claims for damages, as well as all expenses. A separate voucher record should be used for payments from this fund, as well as a voucher on different colored paper.

The disbursements may be classified according to the accompanying classification of accounts, which is used by several small lines.

- A—Damages.
- B—Salaries of claim department employees.
- C—Salaries of physicians.
- D—Attorney's services.
- E—Court costs and witness fees.
- F—Hospital and medical services.
- G—Personal and traveling expenses.
- H—Incidental expenses.

PURCHASE ORDERS AND STORES DEPARTMENT

An order should be written for all purchases made by the company, giving complete information as to qualities, terms, prices, etc.

A number of copies should be made of all orders, the original to be mailed or delivered to the parties from whom the material is purchased. The duplicate is sent to the receiving clerk and placed on file to await the receipt of the material; the triplicate is placed on file in the auditing department to await receipt of invoice and the quadruplicate copy is retained by the superintendent.

If the company is sufficiently large to have a purchasing agent whose duty it is to do the buying for all departments, this routine may be somewhat changed, although the general method will be practically the same. From the copies of the orders in the auditing department information may be obtained in respect to obligation incurred, so that finances may be provided in advance. When the goods are received, the receiving clerk checks the items against the copy of the order and returns it to the auditing department. The copy is attached to the invoice as soon as received.

If material is purchased in quantity to be used over a period of several months, it should be charged to "stock ac-

count" until used or taken from the storeroom, when it should be charged to the proper account.

An inventory should be frequently taken to see if the stock called for by the controlling account on the general ledger is actually on hand. Scrap material should be returned to the storekeeper and the proper account credited, while at frequent intervals the scrap should be sold.

PETTY CASH ACCOUNT AND PAY ROLL

Each day's cash receipts should be deposited in the bank in full on the morning following. No disbursements should be made for the usual miscellaneous expenses, in conducting an office, from the cash receipts.

To provide a fund from which to pay the usual miscellaneous expenses in conducting an office, a suitable amount of cash is advanced to the agent or cashier as a petty cash fund, from which all small expenses are paid.

Each employee working by the day makes out a daily time slip showing his name, time he began work and the time off, the total number of hours and a description of the work performed. These time slips are then sent to the foreman, who approves same and sends them to the auditing department, where the total number of hours is checked and the proper account number indicated on the card. They are then entered on the pay-roll sheet and the total amount due each employee computed twice each month.

All salaried men are kept on a separate pay-roll, which is also made up twice each month the same as with other employees. These are paid by a separate voucher.

AMUSEMENT PARK ACCOUNTS

The accompanying classification of expense accounts is in use by two parks situated in different states and meets practically all the requirements of the two companies operating same.

EXPENSES OF AMUSEMENT PARK

Maintenance.	14—Restaurant and refreshments (Continued).
1 —Buildings.	D—Butter and milk.
2 —Grounds.	E—Ice cream.
3 —Lake.	F—Confections.
4 —Equipment.	G—Pop and soda.
5A—Miscellaneous.	H—Ice.
5B—Ball park.	I—Tobacco and cigars.
Operation.	J—Other supplies.
6 —Theatre.	K—Other expenses.
A—Attractions.	L—Wages.
B—Wages.	15—Light and fuel.
C—Other expenses.	16—Miscellaneous.
7 —Dancing pavilion.	General.
7½—Skating rink.	17—Wages.
8 —Carousal.	A—Superintendents.
9 —Lake.	B—Storekeepers.
A—Launch.	C—Excursion agents.
B—Boats.	D—Other wages.
C—Bathing.	18—Printing and stationery.
10—Laundry.	19—Donations and concessions.
11—Police.	20—Advertising.
12—Music.	21—Excursion agents' expenses.
13—Photograph gallery.	22—Miscellaneous expenses.
14—Restaurant and refreshments.	23—Stable expenses.
A—Meats.	24—Taxes.
B—Groceries.	25—Insurance.
C—Bread and pastry.	

One controlling account is carried in the general ledger for the park receipts, the details of which are carried in an auxiliary ledger or record. The receipts are classified as shown in the accompanying table:

EARNINGS OF AMUSEMENT PARK

Refreshments.	Commissions.
Restaurant.	Roller coaster.
Stand No. 1.	Souvenir.
Stand No. 2.	Telephone.
Stand No. 3.	Photographs.
Stand No. 4.	Old mill.
Stand No. 5.	Ocean wave.
Stand No. 6.	Arcade.
Gum machines.	Circle swing.
Amusements.	Checking.
Theatre—afternoon.	Dance pavilion.
Theatre—evening.	Skating rink.
Dancing—afternoon.	Stand No. 5.
Dancing—evening.	Garage.
Roller skating.	Admissions.
Carousal.	Terminal gate.
Launch.	Upper gate.
Rowboats.	Lower gate.
Bathing.	Dam gate.
	Comps collected.

Three controlling accounts are carried in the general ledger, called "park maintenance," "park operation" and "park general," being the subdivisions into which the park

expenses are divided. At the end of the year these accounts are closed and the net amount carried into profit and loss account.

Ticket sellers or cashiers are stationed at convenient intervals on the ground and settlement is made each night by a representative of the accounting or treasury department for the business done during the day. A daily report is made out by the ticket seller or cashier in duplicate and signed by both the cashier and representative of the accounting department each night at the close of business. No payments are made from the daily receipts, which must be deposited in one amount the following day, except in the case of Sunday or holidays. A fund is provided the park superintendent from which petty items may be paid.

UNITS OF COMPARISON

While there is no one unit that seems to meet the requirements of all cases, the car mileage unit is, perhaps, the most largely used, although the car hour unit is also used by a large number of roads.

There is a point where the car mileage is not equal to its test, for in a blockade the car is stopped and, therefore, the mileage is stopped, but the car hours go on. The car mileage unit is the most important unit of the steam roads, as well as the electric railways; however, there are many things that must be taken into consideration when making comparison with this unit, as some cars have double trucks, some have single trucks, some are motor cars hauling a trailer and some are trailer cars.

The car mileage is very valuable to the mechanical department in determining the life of motors, trucks, axles, etc. This information may be compiled from the conductor's trip sheet if a column is provided showing the starting point of each trip.

Another test that is perhaps the most widely known is the ratio the operating expenses bear to the earnings. The Interstate Commerce Commission, as well as certain state commissions, figures the ratio of each account to the total general account, also the ratio of each account to total operating expenses.

The Union Switch & Signal Company, occupying space 300, is exhibiting signaling appliances of particular interest to interurban electric railroads. Three different arrangements of continuous track circuit automatic block signals are shown by models having moving cars and signals. A fourth working model demonstrates the principle of curve protection. Full-size semaphore and light signals and mechanisms as actually used on railroads are shown in operation as are also track relays, track transformers and impedance bonds. The electric train staff system for single track blocking is also shown in service. In its exhibit the company has aimed to present a practical rather than a theoretical demonstration of signaling systems evolved particularly for interurban traffic. A conspicuous feature of the apparatus exhibits is the full-size specimen of the Union Style B electric semaphore signal, more than 50,000 of which are in service operation throughout the country. The Illinois Traction System has recently installed 175 of these signals on its lines.

The Kerwin Machine Company, Detroit, Mich., has a very interesting working exhibit of the Kerwin-Detroit rail grinder. This grinder is a portable, self-propelled car which operates emery grinders mounted on a sliding carriage. This carriage may be adjusted automatically or by hand to control the position of the emery wheels so they will take from the head of the rail cuts of desired length and depth to obtain a perfectly smooth traction surface. It is used to grind down high and battered joints, cupped rail heads and rail corrugations. The demonstrations are under the supervision of James J. Kerwin.

ADDRESS OF PRESIDENT FORSE TO THE ACCOUNTANTS' ASSOCIATION

It becomes the pleasant duty of your president to review briefly the work of the year that has closed. If in so doing I touch upon that which seems ancient history to some, and discuss matters that are pertinent to all, it will be done because of pardonable enthusiasm for things accomplished by the association as a close-knit working organization with high ideals, throughout the fourteen years of its busy life.

The association, through its committee on standard classification of accounts and form of report, has rendered valuable service to the electric railways of America during the past decade. What was formerly chaos in records and accounts has been succeeded by order and uniformity, and there is now in use a system of electric railway accounting, inaugurated by this association, that has won international recognition. During the past year our association has been represented at the meetings of state and national railroad commissions, when problems affecting the accounting of electric railways were under discussion. The privilege of representation at such meetings and the harmonious spirit which prevails keep us in close touch with developments as they arise and a continuance of this policy is heartily recommended.

A few months ago our attention was directed by interurban railway accountants to correspondence had by them with the Interstate Commerce Commission relating to the matter of destruction of records. Orders have been issued by the commission permitting the steam roads to destroy records and memoranda after preserving them for certain periods of time mentioned in the orders. The commission has stated, in correspondence with some of our interurban member companies, that electric railways shall be governed by Section 20 of the act to regulate commerce, and that the permission given steam road does not apply to electric carriers. A committee of this association has accordingly been appointed to investigate the subject for the purpose of making recommendations to the association and to the commission, relative to the advisability of having orders issued that will modify or place a clear interpretation upon that section of the act which concerns the destruction of records of interstate electric carriers.

While on the subject of interstate carriers it may be well to state that the association has been keenly alive to the development of interstate traffic and the accounting problems of interurban railways during recent years. Its committee on interline accounting will present a report to this convention which treats the subject in a broad, comprehensive manner.

Coincident with the growth of interurban railways there has developed a traffic in the handling of packages and commodities. While not in any sense to be compared with the vast tonnage movements of the steam railways its importance is such as to call for careful study on the part of accountants and operating executives. It is extremely difficult to determine whether or not the rates charged for this class of service are adequate, as there are many items of expense that almost defy segregation as between passenger and freight traffic. Your new committee on freight and express accounting has outlined in its report a plan for a uniform computation of expenses. If some uniform plan is adopted and generally followed it will be an easy matter to compare the operating efficiencies of different properties when the local conditions are fully understood.

The working arrangements between the various affiliated associations whereby matters of common interest are investigated by joint committees result for the good of all. We have had such arrangements during the past year with the Transportation & Traffic Association through the joint committee on freight and express accounting, and with the Engineering Association through a committee which will

bring before this convention a very valuable and timely report.

Features of this year's report of the joint committee with engineers which lend added interest are the discussion of scientific management and the extensive list of published books and articles on the subject which the report contains. This is but another evidence of the fact that the association is quickly responsive to the desire for information upon any subject in the field of accountancy.

The exponents of scientific management lay great stress upon the importance of time study, motion study and a full knowledge of existing conditions before radical steps are taken for the purpose of securing greater efficiency. The same doctrine of "be sure you are right, then go ahead" applies to other phases of industrial life as well as to scientific management. For example, electric railway executives and operators have made many individual efforts to secure accurate information regarding the life of railway physical property, in order to ascertain and properly account for the rate of return on investment or the cost of the service. Some of the railway engineering firms have accumulated considerable data, but the desire for knowledge upon this subject is so widespread that your executive committee deemed it advisable to take up the investigation through a special committee of the association. The committee on life of railway physical property has made an excellent beginning upon what promises to be a valuable work and one that will redound to the credit of this association. It will quite likely be found advisable to enlarge the committee by naming one or more engineers to co-operate in the work of the future.

In summing up the work of the year it is no less a pleasure than a duty to mention the help derived through the hearty co-operation of our members in the work of the association. We owe much to those who have served on committees and those who have prepared papers for discussion. Your executive committee has been active in promoting the welfare of the association and your secretary has again arranged an interesting exhibit of blanks and forms for the convention.

We are fully confident that our association will measure up to the opportunities of the coming years and that the accountant will continue to hold an honored place in this, one of the world's greatest industries.

DECISION IN OMAHA BRIDGE CASE

A decision handed down on Oct. 5, 1911, by the Commerce Court at Washington sustained a ruling of the Interstate Commerce Commission that the commission has authority over the operations of electric railways doing an interstate business. The case was brought to the court on appeal from the United States Circuit Court of Appeals by the Omaha & Council Bluffs Railway Company. This company has charged a 10-cent fare from either Omaha, Neb., or Council Bluffs, Ia., across the Missouri River bridge and into the loop district of either city and a 5-cent fare from the loop district to outlying portions of the city. Complaint having been made of the charges of the company, the commission ordered a reduction in the rates. The company denied the right of the commission to regulate interstate electric railway business. The court held that there was nothing in the history of the legislation that marked the passage of the Interstate Commerce Act which indicated an intent on the part of Congress to exclude interstate passenger street railways from the operation of the law. "On the contrary," held the court, "the terms of the act are broad and comprehensive enough to include them." The preliminary history of this case was published on page 1281 of the *ELECTRIC RAILWAY JOURNAL* for Dec. 25, 1909, and on page 1078 of the issue for June 18, 1910.

REPORT OF THE COMMITTEE ON EDUCATION*

BY H. H. NORRIS, CHAIRMAN; J. F. CALDERWOOD, W. F. KELLY,
D. C. JACKSON, A. S. RICHEY

During 1907 to 1909 the committee on education concerned itself principally with the relation of technical graduates to the electric railway business. A plan for a cadet apprentice course was prepared and brought to the attention of the member companies individually and through the proceedings of the association.

Having done all that seemed practicable in the above direction, the committee turned its attention to a much larger and equally important field. Realizing that there are in the employ of the member companies many young men of limited educational advantages who are capable of developing into first-class mechanics and foremen, the committee desired to do something for them. A correspondence course was planned, somewhat along the lines followed by the American Gas Institute. The plan was laid before the association at the 1909 and 1910 conventions and it met with a cordial response on the part of the member companies.

Correspondence with the member companies was entered into, with the result that a large number indicated their desire to co-operate in putting the plan into practice and tentatively offered to enrol several hundred students in a correspondence course if it were instituted by the association.

The work of the past year has consisted in putting the correspondence plan to a practical test. Five companies were invited to co-operate in an experiment at their own expense. Each was asked to select five young men from various departments and to allow the committee to draw upon it for a sum not to exceed \$150. All the companies expressed their interest in the experiment and an indication of their willingness to contribute any reasonable sum, even greater than that requested, to insure the success of the experiment. The co-operating companies were the Boston & Northern Railway Company, the Boston Elevated Railway Company, the Brooklyn Rapid Transit Company, the Indiana Union Traction Company, and the Public Service Railway Company, and twenty-seven students were enrolled last spring. The committee was fortunate in securing the services of Horace W. Flashman as instructor.

The plan which the committee then put into operation was briefly this: In view of the everyday work of each student, he was assigned a topic for report and questions to be answered, which were designed to force him to observe his daily work closely and to record his observations accurately. As will be agreed, these are among the most important elements of success not only in education but in all lines of human activity. The work was laid out to lead from the tangible apparatus and materials upon which the student was working to the reasons for the form and material and the underlying theory. The students were stimulated to ask questions of their foremen, superintendents and shopmates, and to use other available sources of information. They were supplied at half cost with an elementary reference book on the applications of electricity, and the manufacturing companies willingly furnished bulletins and other trade literature. The committee prepared special report books and other stationery for the convenience of the students and the instructor. The instructor carefully examined the students' work and returned it for correction until it was reasonably satisfactory. [Samples of this work, as well as of correspondence between the instructor and the boys, are given in the appendix to this report, not reprinted.]

The expenditures for the period of the experiment have been as follows:

For instructor's salary	\$434 00
For printing and stationery	48 00

For postage	10 00
For clerical work	43 00

A total of \$535, or \$22 per student.

It was not necessary, therefore, to call upon the co-operating companies for the maximum amounts which the committee had been given the privilege of using. The experiment continued from May 1 to Sept. 1, although most of the month of May was occupied in preliminary correspondence and registration.

As is indicated by the letters from superintendents, foremen and the boys themselves [samples of which are given in the appendix], the work has been helpful in stimulating the students to take a more active interest in their work, to ask questions, to stay at home at night studying into the reasons for the use of certain elements of railway equipment and current standard practice in electric railway work. The duration of the experiment was so short that in spite of the encouraging results the committee is not yet prepared to recommend the establishment of a permanent educational department. It, therefore, proposes the following resolution:

In view of the encouraging results of the educational experiment conducted by the committee on education during the past year, and of the desirability of obtaining additional data regarding the virtues and faults of the methods used, the committee recommends:

- (1) That the experiment be continued another year.
- (2) That the number of students enrolled be increased to 100.
- (3) That the number of students enrolled from each co-operating company be not limited to five, but include all students properly prepared, but
- (4) That in assigning the scholarships due regard be paid to proper geographical distribution, so that the work may be useful to as large a number of companies as possible.
- (5) That each student be expected to pay the sum of \$5 as evidence of his appreciation of the work, and
- (6) That each company be expected to pay a sum not to exceed \$35 for each student enrolled.
- (7) That the work be continued during the entire association year, or as much of it as remains after the plan has been put into effect.
- (8) That in awarding the scholarship due regard be paid to priority of application.

In explanation of the above, it should be said that the committee estimates the maximum expense for all purposes to be \$4,000, of which from one-half to two-thirds will be necessary for the salary of the instructor and the assistants, the remainder being for postage, stationery and stenographic work. This year the co-operating companies were willing to contribute \$30 per student for three months' instruction, which is at the rate of \$120 per student per year. It will be noted that the committee proposes next year to cut down this rate to about one-fourth.

The committee on education desires to call attention to the work of the committee on education of engineering apprentices of the Engineering Association. The excellent work of this committee in attempting to standardize the practical training of electric railway mechanics is quite different from the work of the committee on education of the American Association; in fact, the two lines of work fit in together in an excellent way, acting in a complementary relation to each other. The two committees have kept in touch with each other's work.

[The report is accompanied by seven appendices, of which one, that of the report of the instructor, is reproduced in part].

APPENDIX D. INSTRUCTOR'S REPORT

I take pleasure in outlining the work for correspondence students which I have been conducting under your direction.

The first essential step was the establishment of confidence and sympathy between the boys and the instructor and con-

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

confidence in the boys in themselves. The first letter they were asked to write required a listing and description of the more striking pieces of apparatus they see and work with from day to day—controllers, motors, generators, etc. In this letter they gave some indication of how their interests lay—either by asking questions or by dwelling on certain points, and, based on this, the second problem was assigned. Any misstatements were corrected and references to reading matter given where necessary.

From the answers to the second problem the subject of the third developed. The work tended with each lesson to become more and more individual and personal.

Taking the case of one particular student, the first lesson was on car equipment, the second discussed the difference between shunt and series motors for railway service; next problem, methods of suspension of motors, bearings and the magnetic circuit; then an essay on brushes, while the fifth problem went into the theory of shunt and series motors.

In another case the first problem listed the apparatus manufactured by his employing company in its shops. The second problem was an essay on bearings and lubrication, and the third on the suspension of motors, the use of malleable iron, the magnetic circuit, etc. The fourth problem covered a description of shunt and series motors and the essential differences between them. In the fifth problem the question of trucks was treated. The sixth dealt with wheels. A more theoretical study of shunt and series motors made up the next two problems.

SUBJECTS TREATED

Answers were written by one or more on each of the following subjects: Apparatus in a car equipment make-up, differences between shunt and series motors, motor suspensions, bearings, lubrication, trucks, wheels, brake shoes, operation and care of d. c. generators, the equalizer connection, car building.

In all 227 letters were written to the boys. They were encouraged to ask questions regarding their daily work and their problems were so framed as to provide opportunity for the embodiment of suggestions for increasing the efficiency of such work.

QUALITY OF ANSWERS

To the first one or two problems the answers were brief and hesitant. The boys felt that they were walking through unfamiliar fields of theory and investigation, and were adopting a means of expressing themselves unusual to most of them. At the close of the course, in practically all cases, the answers, though on more difficult subjects, are extended and complete. Sketches are used freely and the boys have learned to go to the manufacturers and to the technical magazines and books for the information needed.

The advantage to the boys of asking questions of their foremen and superintendents has been pointed out to them, and most of the boys are alive to the possibilities of advancement which go with a good showing.

THE ATTITUDE OF THE STUDENTS

Attached to this report are copies of letters received from a number of the boys who express in their own various original ways, but sincerely, their appreciation of what the committee has been doing for them. All are anxious to continue the work and state that for themselves the best method of education has been adopted.

CONCLUSIONS

The educational experiment has demonstrated that the majority of young men are appreciative and will respond, and an improvement can be noticed in the value of their work. It has shown among what men we should look for students.

Any opinion expressed is purely personal and the subject can be viewed from many other points of view, but in the writer's judgment, the best age is from twelve to twenty-four years. In the development from boyhood into manhood a stage exists around sixteen to eighteen years when there

are many things more attractive than study. Later there comes a more mature view of life—an appreciation of life's responsibility and opportunities creates a desire to become equal to them. Furthermore, in general, boys of sixteen to seventeen years have not seen enough of shop apparatus to appreciate its functions, and for several years ahead there is no probability of their employing company imposing any very great responsibility upon them. Our aim is primarily to make better workmen—better educated workmen. Take this in steps—see they are first of all workmen—then educate them. They will have then had practical experience enough to appreciate instruction.

A COMMERCIAL DUPLICATOR

The commercial duplicator of the Duplicator Manufacturing Company, Chicago, Ill., is exhibited at the Chalfonte. This machine is used to produce from five to one hundred copies. The original is written with duplicator ink if hand-written or with a duplicator ribbon or carbon if type-written. Reproductions can be made in thirty seconds. The machine consists of a rigid frame supporting a flat steel bed, over which travels a sheet of highly absorbent gelatine. By means of a feeding carriage, the original or master sheet is brought into contact with the gelatine band which takes an exact impression of the written matter. The copies are produced by feeding blank sheets in the same manner. After one portion of the 14-foot band is used, a new surface is obtained by turning a handle which automatically winds up the used surface as well. No machine is required to remove the ink which remains after copies have been taken off. The band automatically cleans itself. One band can be used over the entire surface once each day and re-used for several months. This feature makes the commercial duplicator inexpensive to operate. The master sheets cost \$0.004 or less each.

REPORT OF THE COMMITTEE ON INTERURBAN RULES*

BY J. W. BROWN, CHAIRMAN; W. R. W. GRIFFIN, C. F. HANDSHY, W. H. COLLINS, F. A. BOUTELLE, A. S. SHANE

The committee this year submits certain suggested amendments to the standard code of interurban rules as adopted at the Denver convention in 1909. This revision has been made to conform to the instructions of the executive committee, which were to the effect that the standard code of interurban rules of this association be again carefully considered and that such, if any, changes be recommended as would seem to provide the maximum of safety for this class of transportation service; that the standard code of the American Railway Association be considered in so far as it appeared to be applicable to interurban operation, and that the standard code of the Transportation & Traffic Association in its entirety be prepared to comprehend general conditions of service and thus admit of acceptance and adoption by the largest proportion of our member companies. Your committee has endeavored to adhere to the above.

Your committee has endeavored to keep in mind the widely divergent conditions existing in interurban service in the different sections of the country, and files its report with the understanding that the suggested revised code in its application by various companies will be added to or subtracted from to meet the requirements of local conditions, and the flexible method of numbering the rules is carried out with this in mind.

[The code as amended has been in the hands of member companies since last June and hence is not reprinted at this time.—Editors.]

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

THE J. G. BRILL EXHIBIT

The exhibit of The J. G. Brill Company and allied companies occupies a prominent position covering 1500 sq. ft. on the left side of the Main Building. It includes a No. 39-E single motor truck in operation on a testing platform. The operation closely approximates service conditions and gives the visitor an opportunity to see exactly how the brake system responds at all speeds and under various loads. The Brill representatives claim that there is no truck of the present day which fills so completely the requirements of highly developed city traffic as the No. 39-E truck. The operation of the truck here shows the distribution of the load on the two axles and its effect on braking, the danger of slipping during acceleration under light loads, the action of the springs under different loads, etc. Those who are using four-motor equipments and are planning to reduce weights will be able to secure figures to show how far the single motor truck is the principal factor in weight reduction. The Brill engineers who are in attendance have data on the subject resulting from recent investigations of some of the large systems. All will be interested in the brake arrangement method adopted for this truck, which applies pressure proportionately to the load on the wheels, and in the action of the Brill "half ball" hangers. The design of the cast-steel bolster, giving maximum strength with minimum weight, is meeting with general approval. The center plates with self-oiling ring, giving positive lubrication for six months without attention, provide another feature worth attention, as do the protection against wear of the bolster transoms and pedestal jaws by readily removable wear plates.

Of special interest is a truck from an order of eighty for the new Cambridge Subway cars of the Boston Elevated Railway. The truck measures 11 ft. 8 in. over the frame and 8 ft. 3 in. over the journal boxes. It weighs about 12,000 lb. and has a center plate capacity per car of about 90,000 lb. The solid forged side frames and the frame construction throughout give to this truck a character unique among M. C. B. types, and particularly the method of securing the side frames together by the forged gusset plates of large dimensions which are folded over the frames and bolted through the inside and outside transom corner brackets. This construction can be used only on solid forged side frames because of their large section of metal, and this, as is known, is a vital point in frame construction on which squareness mainly depends. Another feature of the solid forged side-frame truck is the low curved extension at each end, giving more squareness and adding more to the squareness of the entire frame, the builders claim, than is possible with any other construction. The highly developed method of securing the ends of the pedestals against longitudinal strains deserves investigation. A light interurban truck of the same type as the above is also exhibited.

A truck of the No. 27-GE-1 type is shown at the front of the Pier. The truck bears a sign with the legend "Six hundred of these trucks are being built for the Chicago Railways Company." Except that the wheel base is a trifle longer than usual—4 ft. 10½ in.—the truck has the standard features of this type. On the Boardwalk, next the Pier, a Brill car for city service is the center of attention. This car has a plain arch roof, Brill semi-convertible windows and prepayment platforms. A unique appearance is imparted to the exterior by the color scheme, which is a Quaker gray with gold and Tuscan red striping. The Fitchburg & Leominster (Mass.) Railway purchased this exhibition car on Monday of this week.

The Railway Materials Company, Chicago, Illinois, has no exhibit this year, but is represented by J. F. Church, G. F. Allen, H. T. Marcur and E. C. Folsom.

PREPAYMENT CARS

The Prepayment Car Sales Company, Electric Service Supplies Company, general sales agent, has on exhibit in space 311, Building 2, two platform models of typical prepayment cars, one being of the pay-as-you-enter type, the other of the pay-within type. The pay-as-you-enter platform is of the center bulkhead design, this bulkhead accommodating two sliding doors by which means the entrance and exit from the car body to the platform is obtained. One side of this pay-as-you-enter platform has a sliding door, which gives a door opening of 30 in. This door is controlled by the motorman when this end of the car is the front end and is closed entirely when used as the rear end. The other side of this platform, normally open when this end of the car is the rear, has a four-leaf door which may be used to close this side entirely. A folding seat is used to afford seating capacity on the platform.

The pay-within platform is inclosed with four-leaf folding doors and disappearing steps, manually operated. These doors give a platform opening of 52 in. The door on one side of the platform is operated by the motorman when used for exit, while the door on the other side is controlled by the conductor when used for entrance. The platform has the extended car floor on which the conductor with his control stand is located.

For convenience in exhibition, these car ends are interconnected by the floor which is built between them. Entrance to the car may be had from either of the platforms or by a set of steps running up to the car floor level on one side of the car. The Prepayment Car Sales Company also has on exhibition an angle iron skeleton model showing in detail the operating mechanism of the prepayment car doors and steps. Many other features have been incorporated in these models to make them typical specimens of prepayment cars for practical operating conditions.

ALLIS-CHALMERS EXHIBIT

Several very interesting exhibits are offered by the Allis-Chalmers Company in spaces 21 and 23 on the left aisle of the main building. The section of a steam turbine which is displayed presents the details of construction to advantage, the blading and balancing features being plainly shown. Both straight and automatic air brake equipments are mounted on racks where the operation of the compressors, governors, engine valves, etc., can be plainly seen. A type 501 interpole railway motor is disassembled to show the construction, while types 301 and 302 standard railway motors are shown on skids. Type S-3 controller, for two-motor equipments, and type S-4, for four-motor equipments, are opened up to exhibit the main and reverse drums, which are made of a special composition called "Menite," which is not affected by arcing and will stand a very high degree of heat before its electrical or mechanical qualities are injured.

A new type of self-cooled transformer is also shown. This has an external jacket which is connected with the main oil tank at several points at both top and bottom. This construction gives three cooling surfaces and provides for the circulation and the rapid cooling of the oil. A complete line of repair parts for air brake equipment and compressors is displayed on tables. Here are also shown the parts of the new Allis-Chalmers air compressor known as the AA-7.

The Illinois Traction System car which is being exhibited by the St. Louis Car Company, and which is one of twelve built by that company for that corporation, was brought from Venice, Ill., to Atlantic City on its own wheels behind one of the regular through passenger trains of the Pennsylvania Railroad.

Among the Exhibits

Atlas Railway Supply Company is exhibiting its complete line of rail joints, tie plates and braces, insulated joints, etc., in Aquarium Court.

* * *

Globe Ticket Company, Philadelphia, Pa., has an interesting exhibit this year at space 279. Special attention is called to its p. m. coupon transfers, which are now in use by over two hundred companies throughout the country.

* * *

A new grade "M" carbon brush is being exhibited by the Speer Carbon Company at space 255. In this connection the company is giving away a neat scale, with which to adjust the spring pressure on the back of brushes.

* * *

Whittier Mills Company, of Chattahoochee, Ga., is showing in space 43½, building 1, samples of bell and trolley cord solid braided and centerless, in which each strand is individually waterproof.

* * *

Paving blocks for all kinds of track paving are being exhibited by the U. S. Wood Preserving Company at Space 303-D. The fine condition of blocks which have been in service for over eight years is also shown. The company's representatives are G. O. Strother and Alexander Reed.

* * *

National Lead Company, New York, N. Y., shows in spaces 317, 319, Building 3, a complete line of its products such as Phœnix babbitt metal, heavy pressure metal, anti-friction metal, bearing metal, sterling journal metal and bar and wire solder. Representatives in attendance are J. B. Mendenhall, Wm. A. Dail, E. A. de Campi.

* * *

C.-O.-Wood-Preserver Company, St. Louis, Mo., is showing in space 208 some interesting specimens of timbers which have been taken up from the tracks of the Long Island Railroad, Freeport Railway & Light Company, Denver City Tramway and Dallas Consolidated Railway, which show the exact condition of the wood after many years of service.

* * *

The exhibit of the Nelson Valve Company, spaces 123-125, is of particular interest to members of the engineering association. The display includes power station valves for all pressures and purposes. Perfect steel castings in rough and section unpainted are shown free from any shrink or defect. The seatless boiler blow-off type is also exhibited, in full size, sectioned. Represented by Carlisle Mason, W. J. Spencer, Russell Bonnell, M. D. Baldy, R. E. Thomas.

* * *

Conventionites who are interested in comfortable cars and window sash that operate easily and prevent accidents by falling should visit the exhibit of the McCord Manufacturing Company, space 330, and see the demonstration of the McCord Universal weather stripping. This product is equally applicable to old and new cars, and it provides positive stormproof windows and allows the sash to be operated easily under all conditions. The company is also showing thirteen models of other improved car window devices.

* * *

The "Halsey" radial truck, exhibited by the Philadelphia Holding Company, at spaces 332, 334, 336, is attracting a great deal of attention as a departure in rolling stock. With this truck the limit of permissible wheel base heretofore governed by curve radius is removed. The wheel base can be made of any required length to carry the car body prop-

erly. The truck as exhibited has a wheel-base of 16 ft. and is set on a 33-deg. curve.

* * *

Unfortunately the car which the Jewett Car Company shipped for exhibit at the convention is still on the road somewhere between Newark, Ohio, and Atlantic City, and the chances seem to be that it will not arrive in time to be available. This car is one of an order of 150 pay-within cars being built for the Capitol Traction Company, Washington, D. C. It is 41 ft. long and is equipped with the pay-within door operating mechanism. Sales Manager Besuden is, of course, at the convention as usual.

* * *

The St. Louis Steel Foundries have an interesting exhibit at space 309C of manganese-steel special track work, showing a switch, mate and frog of solid manganese. The switches are built up with only four parts. As these are massive and composed of manganese steel, they are practically indestructible. The manganese used by the Foundries is manufactured in their own plant at St. Louis. The exhibits shown are part of a lay-out built for the Los Angeles street railways.

* * *

As an object lesson in substantial track construction, the New York Switch & Crossing Company, Hoboken, N. J., is showing in spaces 248, 250, 252 a solid manganese anti-straddling tongue switch and mate, a 9-in. rail hard-center combination tongue switch, a T-rail hard-center anti-straddling tongue switch and a hard-center mate frog and crossing; also modern girder rail sections. Representatives are W. C. Wood, H. R. Sherman, A. W. Kennedy, William Weller, John Madge.

* * *

The new Root pneumatic scraper is shown by the Root Spring Scraper Company, Kalamazoo, Mich., at space 411. This scraper is connected with the main air line of the car and is operated by the motorman by means of a three-way air valve located on the front platform. It was designed especially to meet the growing demand for an automatically operated scraper. It does away with the wheel on the platform of the ordinary scraper, is much easier to operate and cheaper to install. It is impossible for the blades to drop when not in use. The scraper is so adjusted that when full air pressure is applied the scraper is held to the rail with proper tension, and when so adjusted the motorman can make no mistake in handling the scraper. In operation one charge of air is ample to hold the blades to the rail for an entire trip. The other types of spring scrapers manufactured by the company are also shown as installed in working position on a car. Fred N. Root, manager, is in charge of the exhibit.

* * *

The General Electric Company shows the "Ideal" steel-flanged trolley wheel now standard on all original equipments furnished by this company. The hub and tread is a one-piece copper casting which is afterward drop-forged. The flanges, which are soft steel stampings, are secured to the casting by turning over the ends of the hub against the flanges. This construction gives an almost perfect balance to the wheels. The flanges are stiffened by turning over their outer edges. Lubrication is accomplished by means of graphite bushings. The steel-flanged wheels are furnished in 4½-in. and 6-in. sizes. Either size wheel has a ½-in. or ⅝-in. bore. The length of hub of the 4½-in. wheel is 1½ in. while the 6-in. is made either 1½ in. or 2 in. A new line of cast alloy spoke wheels is also shown. Graphite bushings provide lubrication and, in the larger sizes, this is supplemented by oil held in an annular reservoir. These wheels are made in 4¼ in., 4½ in., 5 in., 5½ in. and 6 in. sizes. The hubs for the smaller sizes are 1½ in. long and for the larger ones 1½ or 2 in. long. Each size of wheel has a bore of either ½-in. or ⅝-in. diameter.

As usual, the tastefully decorated parlors of the Galena Signal Oil Company are the haven of the tired sightseers.

* * *

The Mica Insulator Company, New York, is represented at the convention by C. H. Bell and A. F. Tinnerholm.

* * *

Wheel Truing Brakeshoe, Detroit, Mich., has an attractive display of wheel-truing brakeshoes in space 347, Building 4.

* * *

The Union Electric Company, Pittsburgh, Pa., is being represented this year by T. M. Cluley and George W. Provost.

* * *

Henry Gulick, of the Gulick-Henderson Company, is attending the convention this year, renewing all of his old acquaintances.

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The Flood Concrete Tie Company, Bridgeport, Conn., is located in space 274, where visitors will be welcomed. John H. Flood is in charge.

* * *

The Under-Feed Stoker Company of America is showing in spaces 404, 406 a model Jones Stoker. The representatives are distributing stoker catalogs and the company's magazine.

* * *

M. Rounds, Stoughton, Mass., the inventor of a prepayment, convertible car and of an articulated car, is a visitor at this convention. Mr. Rounds is prepared to furnish plans and specifications for cars of these types for city and suburban service and also to act as consulting engineer on car design.

* * *

The Star Brass Works, Kalamazoo, Mich., is showing in space 341 twenty styles of Kalamazoo wheels and eight styles of harps. This company asserts that it manufactures 75 per cent of the trolley wheels used in this country. One of the reasons given for holding it the leading position in this respect is the use only of new metal in every wheel which it sends out, thus giving long life without injury to the wire.

* * *

The Hale & Kilburn Company, Philadelphia, Pa., located at spaces 421-424, presents several unique features not hitherto shown—one being its finished pressed-steel sections of all-steel interiors for coaches and cars. This material, which is manufactured in the company's factory and shipped to the car builders "knocked down," can be erected by the latter without refitting. The all-steel frame car seats also present a new feature of combined light weight and greater durability.

* * *

Among the exhibits is one made by the Chicago Railway Equipment Company. Creco and several other types of metal brake beams are shown, as well as Creco roller side bearings, Creco journal boxes and miscellaneous malleable castings for electric railway equipment. The representatives of the company are also showing a novel and exceedingly interesting relief map of the Panama Canal and surrounding country which they are distributing. Edwin F. Leigh and C. P. Williams are in charge of the exhibit at space 438.

* * *

The Positive Clutch & Pulley Works, Buffalo, N. Y., is showing at spaces 262, 264, models of the Positive combined jaw and friction clutch, which combines two features of friction and jaw drive. The combining of these two principles permits the picking up of the load without a strain or jerk on the motor and the transfer of the load to a positive jaw drive which gives a steady drive and with no loss of power. The exhibit is in charge of S. A. Benedict, treasurer and general manager of the company.

The Curtain Supply Company, Chicago, Ill., is showing the Rex all-metal curtain roller at spaces 380, 381, 382. This roller was first brought out one year ago, but has already been widely adopted. The company is also showing a new Rex steel sash balance. This is an all steel roller used for operating balance windows. The roller is made of brazed steel tube with tempered steel ends. The operating chains are detachable, allowing them to be repaired easily. The springs and other parts are interchangeable; also curtain ring fixtures and curtains and accessories are displayed.

* * *

A leather lubricating packing is shown by the Standard Leather Packing Company, Boston, Mass., in space 409. Prepared and treated shredded leather forms the principal absorbent used in its manufacture, the claim being that this packing requires much less attention than wool waste, as it remains plastic under all temperature conditions. The absorbent quality of the shredded leather, together with the ease with which it gives up the lubricant to the journal, is a unique feature of the product. Owing to its nature, the packing automatically stirs itself. When the car changes direction the journal is automatically repacked. The exhibit is in charge of W. A. Farnsworth, treasurer, and P. H. Wilhelm, railroad representative.

* * *

The Cleveland Frog & Crossing Company, Cleveland, Ohio, is making an elaborate exhibit of track special work at its large space, 168, which extends clear across the south end of Machinery Hall. Among the new things this year is an example of split-switch and spring-frog construction for electric railway work. This follows steam railway practice more closely in weight and strength than the type in general use. A crossing for steam and electric roads is shown, the steam railroad part of which is made of rolled manganese rails, the construction of the entire crossing being of the "built-up" type. Another feature of the exhibit is a street intersection for electric railways "built up" of girder rails which is an example of accurate and careful fitting.

* * *

A motor-driven four-spindle drill is one of the new things shown by the American Steel & Wire Company. This drill is designed for use in installing twin terminal bonds. It has three wheels which run on the track rails. The operating motor is accurately balanced between the rails. The drills are easily adjusted. The company is also showing a new bond known as type S. C. S.-02. This is of the solid compressed-stud soldered type. It is similar to the ordinary compressed stud bond, but has an enlarged crown. Other things shown are samples of the wires and cables, wire ropes and strands, various types of bonds and the Improved crown rail bond tester. This tester is said to be the only instrument that is wholly self-contained and that can be used on a dead rail or on rails used for A. C. return circuits.

* * *

The Consolidated Car Heating Company's showing at spaces 376, 379 is of exceptional interest on account of the many new devices presented. A thermostat for controlling electric heaters is shown, maintaining the temperature of a box within 1 deg. of the proper temperature. A pneumatic door-operating device is exhibited in operation with electric control. A small heater for heating water for house or use on Pullman cars is also in operation at this booth. An auxiliary battery lighting system of the automatic type is another feature. A new air-brake governor which provides a very close range of adjustment, a tilting heat deflector for preventing overheating of seats, a hot-air ventilating stove, a full line of 600-volt and 1200-volt heaters and switches, fuse boxes, electric couplers and trolley voltage push buttons and signal systems are also on exhibition.

Railway Roller Bearing Company, Syracuse, N. Y., has received a second order for Rollway journal boxes through The J. G. Brill Company for four storage-battery trucks to be operated by the Third Avenue Railway, New York, making a total of forty-one Rollway journal cars operated by this company.

* * *

The Acme Indicator Company, Cleveland, Ohio, decided at the last moment not to make any exhibit owing to the sudden death on Oct 3 of its president, Major C. W. Johnson. T. W. Small, secretary of the company, had planned to visit the convention, but finds it will be necessary to remain in Cleveland, where the company's indicators are installed on two lines.

* * *

Malleable iron truck and brake forgings are a feature of the Columbia Machine Works & Malleable Iron Company's exhibit. Forty-seven separate forgings are displayed. Pinion pulleys, controller handles, brake handles, pressed steel gear cases and bronze bearings, etc., are also shown. R. W. Kerschner, James Grady and M. F. Zigler are representing the company.

* * *

The National Tube Company is showing at spaces 354-357 a remarkable table which is made up of thousands of pieces of Shelby seamless, cold-drawn steel tubing. Each piece is from a tube made to customers' orders. This table is a valuable object lesson in demonstrating the extraordinary variety of shapes and sizes in which this tubing is made and in suggesting possibilities for other uses.

* * *

A striking feature of the exhibit of McGuire-Cummings Manufacturing Company, Chicago, Ill., is the complete model of its solid steel Columbia truck for single truck cars, which is in service on cars of the Chicago Railways Company, Twin City Rapid Transit Company and many other large city properties. One of the important features of this truck is the use of a spring over the journal box to prevent oscillation.

* * *

The Wilson Remover Company, New York, space 43, is demonstrating paint and varnish removers and an advanced process of "stripping" steel equipment, showing the air motor and centrifugal steel brush (2000 r. p. m.) used for cleaning loosened paint and varnish from surfaces of passenger coaches, tender tanks, etc. J. MacNaull Wilson, president, and J. Whitney Wilson are representing the company.

* * *

The National Carbon Company, Cleveland, Ohio, is displaying some Laclede railway motor brushes which have given excellent results in long service. One set of these brushes was taken from an interurban railway motor after 30,000 miles' service and shows only 3-16-in. wear on the brush surface. The armature and commutator of this motor are also displayed to show the fine condition in which they were found after the long run with these brushes.

* * *

Rail Joint Company, New York, N. Y., has space 120, Aquarium Court, where it is exhibiting some finely finished samples of Continuous, Weber and Wolhaupter standard joints, Continuous and Weber girder and high T-rail joints, Continuous and Weber insulated joints, and Continuous frog and switch and compromise joints. Over 50,000 miles of railway track are now equipped with these joints. Representatives are 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.

* * *

Two sizes of pressed steel hot-water car heaters are shown by the Cooper Heater Company, Dayton, Ohio, in space

223. The company is also distributing a booklet on its new forced ventilation hot-air car heater, which is made in three sizes. The induction draft or funnel-shaped roof intake used with the hot-air heater draws in sufficient air, especially on interurban cars, to operate the heating system without the use of a motor. In general, the heaters are so constructed that they can be used with or without a blower motor, according to requirements.

* * *

Automatic lubricators, designed for use with air brake equipment, are on exhibit by the Emery Pneumatic Lubricator Company, St. Louis, Mo., in space 219. This lubricator is inserted in the air supply pipe of the brake system close to the main reservoirs. All air in passing into the service pipes is thereby charged with lubricant and is carried to all surfaces with which the air comes into contact. The company is also showing a sample of the Emery brake cylinder lubricant, which can be manually applied to the wearing parts of the air brake equipment.

* * *

A complete line of hot water and forced ventilation car heaters comprises the exhibit of the Peter Smith Heater Company, Detroit, Mich., in spaces 254, 256. This includes an improved heater equipped with protective features and ball-bearing motor; also two types of a forced ventilation electric heater which is shown in operation. This latter heater is designed along lines similar to the forced ventilation coal-burning heater, but it is so small that it can readily be placed under a car seat or in another location as desired. The chief features of this heater are its ability to ventilate adequately and its economical current consumption.

* * *

The Acme type drop fender, which was reported to have received the highest rating (81.9 per cent.) at the tests made in May at St. Louis by the Board of Public Works, is a feature of the exhibit of the Eclipse Railway Supply Company, Cleveland, at spaces 265, 267. It is claimed that in case of collision this type of fender does not interfere with the action of bumper anti-telescoping devices. The Standard Eclipse life guard, Style C, in connection with the new multiple wheel guard is also shown. A striking feature of the exhibit is a Biogen moving-picture machine which shows an actual fender demonstration of a man being picked up by a car moving at 22 m. p. h.

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Goldschmidt Thermit Company, New York, has spaces 212, 214 for a moving-picture exhibit showing the welding of the full section of a rail in Everett, Mass., and the welding of locomotive frames; sample welds of compromise and straight rail; welding apparatus; various kinds of thermit and metals manufactured by the thermit process, and a broken motor case completely welded. In space 169 the company is showing the new Pellissier rail grinder, the principal features of which are comparatively small size, the over-all dimensions being about 5 ft. 9 in. x 8 ft. 6 in.; weight about 2,800 lbs.; two independent grinder units having vertical and horizontal adjustment and special adjustment for bringing the surface of the emery wheel parallel with the rail surface; eccentric attachment for automatic ally grinding out low joints to a true curve; derailing attachment for removing grinder quickly from the track; power and hand drive for moving the grinder along the track; simplicity; ease of adjustment, and ability to remove large amount of metal in a short time. Representatives are W. C. Cuntz, general manager; G. E. Pellissier, superintendent and engineer; L. Heyneman, manager Pacific Coast branch; W. R. Hulbert, sales manager; Dr. E. Beck, metallurgist; H. B. Atkins, comptroller; H. S. Mann, W. A. Aldrich, J. G. McCarthy, sales representatives, and E. Begtrup, demonstrator.

The Tool Steel Gear & Pinion Company's representatives are as follows: C. E. Sawtelle, Cincinnati, stopping at the Dennis; Leroy Brooks, Jr., Cincinnati, the Traymore, and S. I. Wailes, San Francisco, the Brighton.

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Convenience and accuracy in handling coins of all denominations in large numbers are demonstrated by the coin-counting machines of the Johnson Coin Counting Machine Company, New York, N. Y., at spaces 261, 263. The representatives on hand are C. H. Birdsall, W. P. Butler, S. F. Champion, Jr., J. M. Johnson.

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A full-sized model of a four-step entrance to an interurban or a steam railway car is exhibited by the Universal Safety Tread Company, Boston, Mass., at its space 387, Building 3, to illustrate more fully the application of Universal safety treads to car steps. Various types of Universal treads for other purposes are also shown. Representatives are F. W. Langford, A. L. Whipple.

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A large assortment of armature and field coils made from Heany fireproof insulated wire is displayed by the Heany Company, New York, N. Y., in space 416. Samples of this wire ranging from No. 30 to No. 00 can be had on request. Heany tungsten lamps also occupy a prominent place, several being mounted on a special stand to show the lamp under adverse conditions. Representatives are R. K. Dana, F. A. Duff, F. A. R. Hoffeditz.

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Samples of all types of standard brake shoes are displayed by the American Brake Shoe & Foundry Company, Mahwah, N. J. The corps of representatives includes W. G. Pearce, vice-president; W. S. McGowan, sales manager; J. B. Tarbell, vice-president; F. W. Sargent, chief engineer; J. S. Thompson, T. L. Coolidge, E. L. James, G. R. Law, A. H. Elliot, T. Seaman, E. B. Smith, R. M. Brower, W. L. Boyer, R. E. Holt, L. R. Dewey, J. G. Tawse.

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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-climber. There are forty-nine roads and a total of 5719 cars. Besides the anti-climber 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.

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The Standard Coupler Company, New York, N. Y., is making an operating exhibit of the Shim slack adjuster at spaces 324, 326. After the first showing at last year's convention, the company received a large number of trial orders. During the year the results have proved so satisfactory that sixty-seven roads have equipped a large part of their cars with this adjuster. All electric cars on the Pennsylvania Railroad are so equipped. The merits of this slack adjuster are explained by George A. Post, E. H. Walker, George A. Post, Jr., C. D. Jenks, W. H. Sauvage.

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The National Lock Washer Company exhibit in spaces 320, 322, Building 3, features this company's (non-creeping) cam curtain fixture, which is made of steel tubing and has bronze heads and pinch handles. Creeping is prevented by an eccentric grip, the tension may be adjusted, and release is accomplished by direct action on the eccentric, the heads remaining stationary in the grooves. Passengers cannot draw the fixture from the grooves. Sash locks and sash balances and the National lock washers are also shown by this company, which is represented by W. C. Dodd, F. B. Archibald, R. B. Brown, J. H. Horn, D. H. Hoyt.

The Johnson Fare Box Company, New York, N. Y., is exhibiting the Johnson registering fare boxes at spaces 261-263. During the year after thorough tests orders and repeat orders have been received from the following roads: Third Avenue Railroad, New York, N. Y., 550 boxes; Public Service Railway, Newark, N. J., 300 boxes; United Railways Company of St. Louis, 185 boxes; Oakland (Cal.) Traction Company, 122 boxes; United Railroads of San Francisco, 11 boxes; Omaha & Council Bluffs Street Railway, 30 boxes, and Dayton Traction Company, 50 boxes. The company is represented by C. H. Birdsall, W. P. Butler, S. F. Champion, Jr., J. M. Johnson.

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The General Railway Signal Company, Rochester, N. Y., is distributing Bulletin No. 123, which describes its exhibit at this convention. Among the apparatus shown are universal signals of various types, light signals, relays and indicators, reactance bonds, signal transformers, switch boxes and telephone selectors. Attention is called to the fact that the signals, relays, transformers and other parts are of universal application, as they are made to meet the widest range of requirements with slight changes or by combinations of parts, thereby reducing to a minimum the stock which the user of a signal system would have to carry. The convention booklet contains many views of electric railway installations made by this company.

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Pyrene Manufacturing Company, New York, N. Y., is at space 165. Pyrene is a highly volatile fire-extinguishing liquid of a red color. It is contained in a squirt gun, and one quart when squirted from the gun generates in contact with the air about 3700 cu. ft. of gas. This gas at a temperature of 200 deg. or over is condensed to a heavy blanket which envelops an incipient fire and completely suffocates the flame. The gas is a non-conductor of electricity. In the power house a fire between the commutator and brushes can be instantly extinguished, while in a car the blowing out of an armature and the consequent likelihood of burning the car can also be stopped instantly with this chemical. The Pyrene squirt gun is very handy for reaching inconvenient places. Among the users of Pyrene are the Interborough Rapid Transit Company, Chicago City Railway, the United States government, and many electric railway, light and power companies. Representatives are H. T. Porter, G. H. Peterson, H. C. Futch, C. E. Ware.

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Railway Improvement Company, New York, has spaces 135, 137, 139 for showing its coasting time recorder, which checks motormen and so reduces current consumption. These recorders are attractively mounted and their operation is explained. The methods of keeping accurate records are also demonstrated. The company is showing a terminal clock for checking the arrival and departure of cars, and also exhibiting a small current clock and the Ferranti traction meter. The "Rico" sanitary hand strap is an additional feature of interest. Since the introduction of the coasting time recorders, a year ago, many prominent railways in various parts of the world are using them. Among these are: Interborough Rapid Transit Company, New York; Boston Elevated Railway, Chicago Railways Company, London Electric Railways (London Underground), United Tramways, Montevideo, Uruguay; Rio de Janeiro Railway, Brazil; Denver City Railway, Montreal Street Railway. The following officers and representatives of the company are present: Frank Hedley, president; Andrew J. Pizzini, vice-president and general manager; Rufus L. MacDuffie, vice-president; William O. Welde, chief engineer; Harry Keegan, Western representative; Garrit S. Cannon, George B. Campion, New York office.