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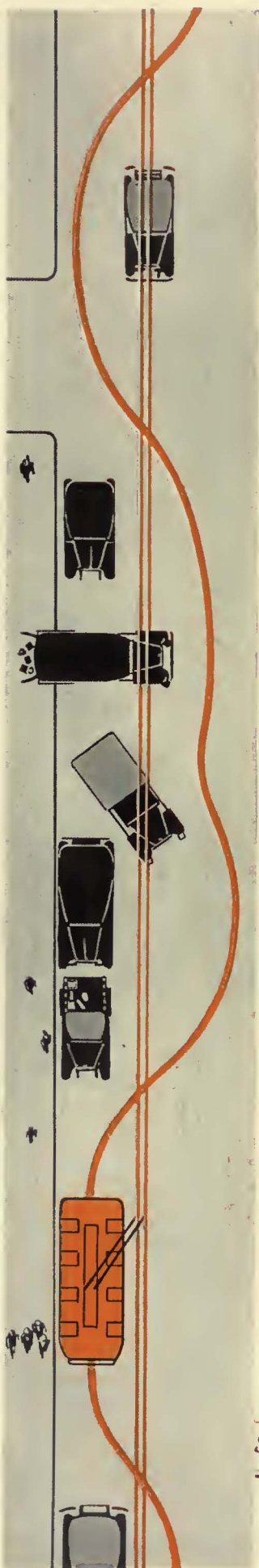
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ELECTRIC RAILWAY JOURNAL

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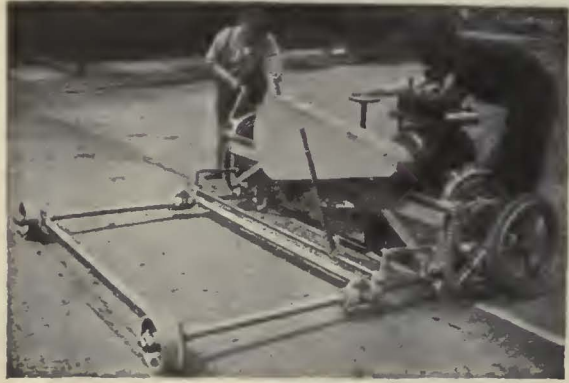
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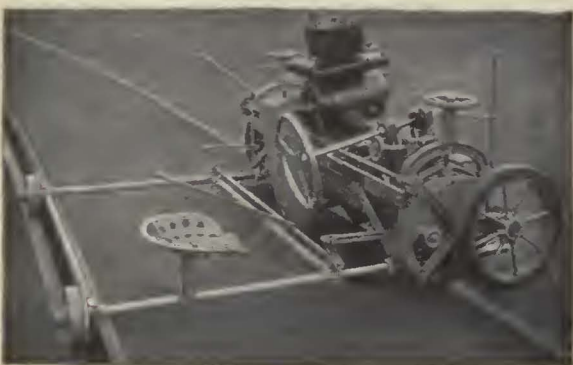
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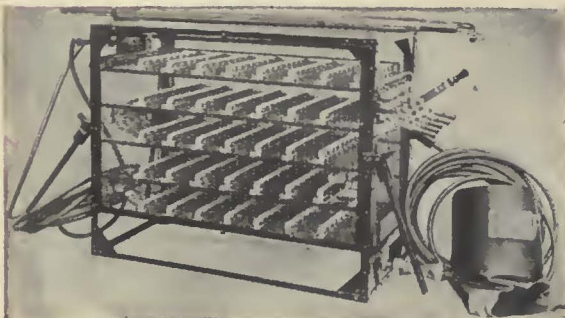
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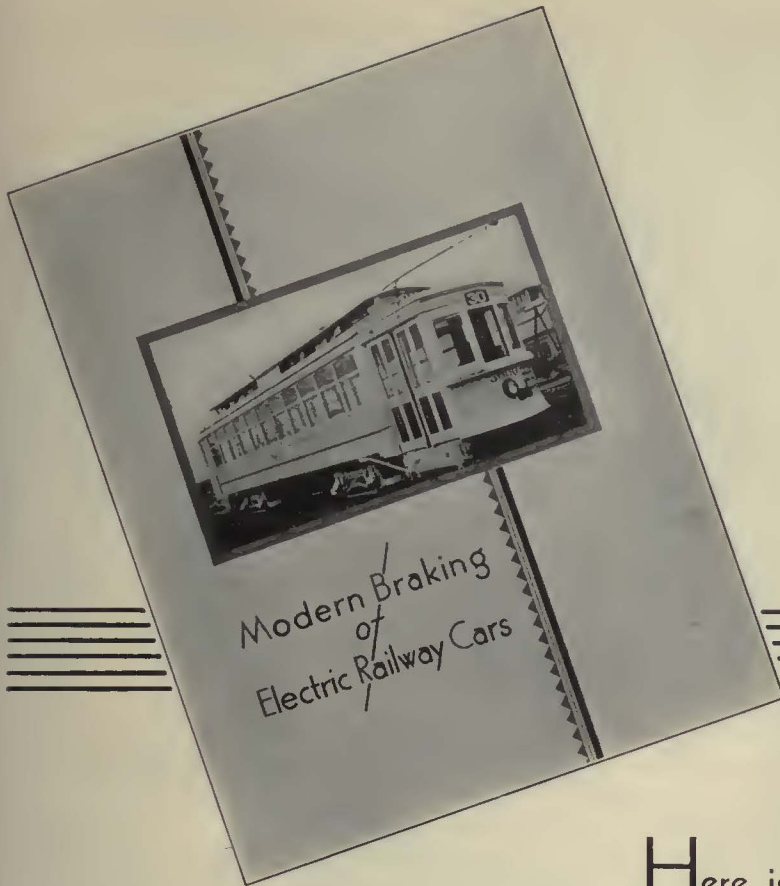
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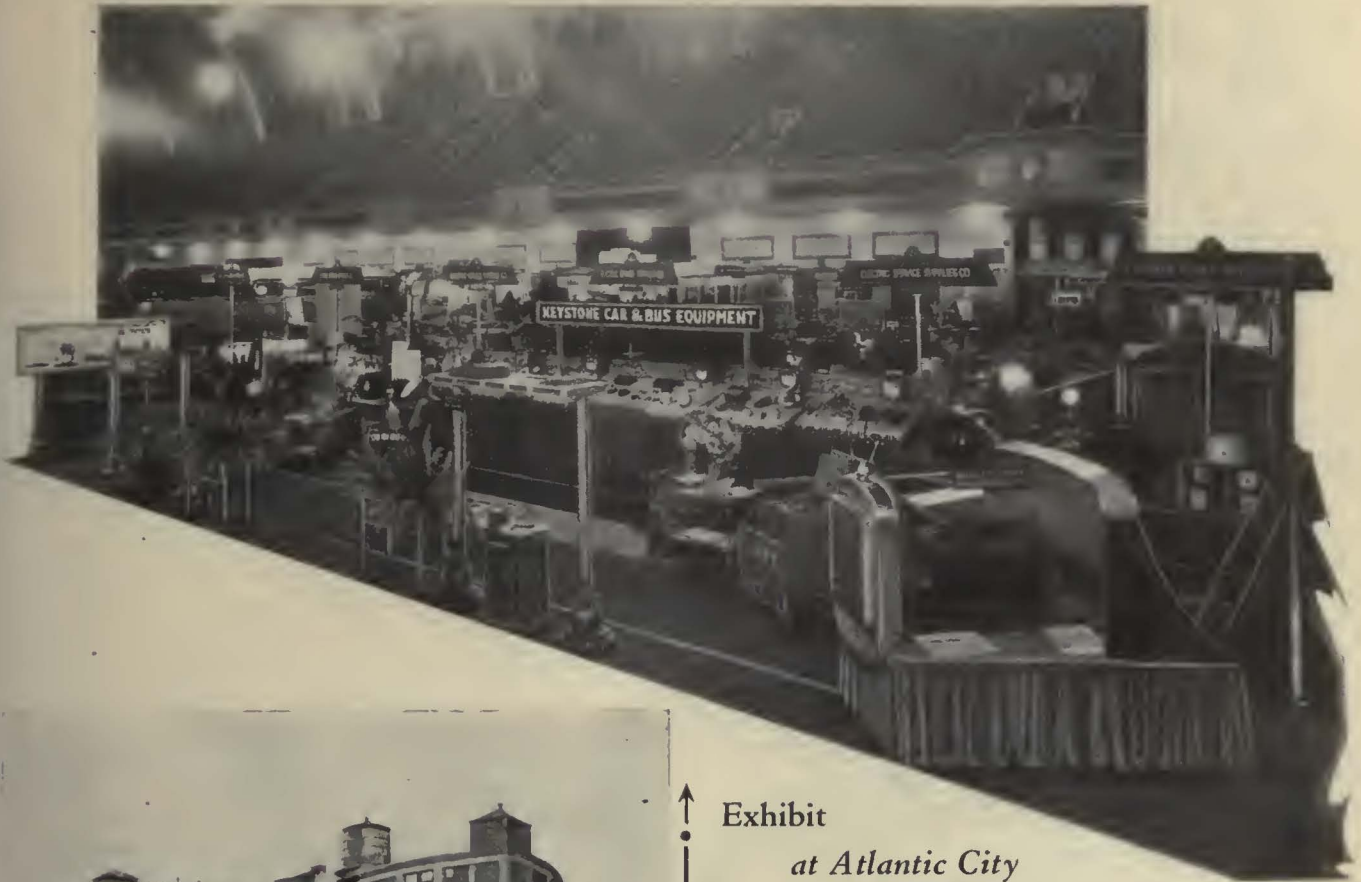
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ELECTRIC RAILWAY JOURNAL

New York,
October, 1931

Consolidation of
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Volume 75
Number 11

JOHN A. MILLER, Editor

Confidence Strengthened by Progress Shown at A.E.R.A. Convention

SUCCESSFUL and encouraging in every respect, the 50th annual convention of the American Electric Railway Association held at Atlantic City last week was an outstanding illustration of the ability of the local transportation industry to maintain its record of progress despite all obstacles. Both the attendance and the size of the exhibit were remarkably large for a year of severe business depression. Altogether more than 4,000 persons attended the convention. While this was somewhat less than the attendance at the A.E.R.A. convention in Atlantic City two years ago, the proportion of operators was larger than usual, the decrease being mostly among the ladies and guests. This excellent showing demonstrates again the high valuation which the industry places on the annual meeting. Some 80,000 sq. ft. of exhibit space was sold, approximately four-fifths of that sold at the convention two years ago. A particularly interesting feature of the exhibit was the display of transportation vehicles on the Boardwalk. This included the latest type of interurban car, a large and a small city car, a large and a small trolley bus, motor buses of various sizes and a taxicab. All were painted a uniform color and decorated with the symbol of the association to emphasize the idea of co-ordinated transportation.

Competition of Private Vehicles Slackening

EVERYWHERE a spirit of confidence was in the air. Many indications could be seen of the growing recognition of the importance of public transportation. This was emphasized particularly by the remarks of several speakers from outside the industry, as well as by the reports of various committees of the association. That a substantial volume of traffic has been lost by the public carriers to the private automobiles is well known. There is reason to believe, however, that this

trend has about reached its apex. Automobile registrations are not increasing at their former rapid rate. Financial as well as physical limitations are bringing to a close the era of providing more and more roadway space in urban areas for the use of private vehicles. The existing roadways are already overcrowded in most cities and it is becoming more clearly evident every day that adequate public transportation facilities are absolutely indispensable.

All of the operating companies have suffered as a result of the general business and industrial depression. Some report a slight trend back toward public transportation on the part of people who are finding private transportation too expensive under existing conditions. This gain in patronage, however, has been small as compared with the losses due to widespread unemployment. Nevertheless the operating companies have been able in a considerable measure to balance their budgets by curtailing expenses in proportion to the decrease in revenue. How this has been done was the subject of lively discussion at several of the luncheon conferences.

Equipment Modernization Attracts Attention

PROGRESS in modernization of rail equipment aroused keen interest among the delegates. The presentation of a report of the work being done by the Electric Railway Presidents' Conference Committee drew a large crowd to the meeting hall. While no attempt was made to go into detail concerning the research being conducted under the auspices of this body, the summary presented by its chief engineer gave the audience a much clearer understanding than they had before of what is being done. Then, too, the display of transportation vehicles on the Boardwalk under the auspices of the Manufacturers' Advisory Committee showed that much progress in design already has been

made. Great interest was shown in this display as well as in the new equipment exhibited in the Auditorium. The improvement in products indicates that the manufacturers are spending money on development even in the face of curtailed buying.

Closely akin to the interest in rail-car development was that displayed in the trolley bus. Representatives of companies which operate trolley buses were subjected to close questioning by other transportation men who are considering the use of this vehicle on their own properties. It was brought out clearly that under certain conditions the trolley bus possesses numerous advantages. At the same time the comment on this subject indicated a general recognition that this new vehicle is not a universal remedy for all transportation troubles, but should be adopted and used only where conditions are suitable.

As in previous years, the railway men were much interested in motor bus developments. Many new designs were shown. Those that appeared to attract the greatest amount of attention were the large types for heavy-duty and the small-capacity types for light traffic. Discussion of motor bus design, operation and maintenance took place both at the regular sessions and at the luncheon conferences.

Need for Better Fare Structure Recognized

INTEREST in the subject of fares was no less keen than that shown in the new equipment. A conviction has been growing in the minds of transportation men for several years that the industry knows too little about fares and the way the public reacts to changes in rates. This matter has been under intensive investigation by a special committee of the American Association for the purpose of "determining the relation between price and patronage." No simple and easy solution of the problem has been found nor is such a solution likely. Certain conclusions have been reached, however, with which there is likely to be general agreement. It is now widely recognized that the old flat rate for anybody riding any distance at any period of the day is no longer satisfactory. Experiments are being made to develop a fare structure on the principle that the occasional rider should pay the maximum rate, the regular every-day rider should have a reduced rate, and that some sort of attractive special rate should be offered to stimulate riding in the off-peak hours.

Coffin Award Won by Milwaukee Company

PRESENTATION of the Charles A. Coffin Award was, as always, a notable feature of the convention. This year the prize was won by the Milwaukee Electric Railway & Light Company for its record of "continuity in progress," despite the adverse influences of general economic conditions. This company's achievement in so adjusting its rates that both riding and revenue have been increased, in reducing operating expenses without sacrificing efficiency, in improving its safety record

and in building better public and employee relationships were recognized as outstanding contributions to the industry during the year. The recent accomplishments at Milwaukee have been of a high order and should give real encouragement to the efforts of other managements to overcome the obstacles of a similar nature which they themselves are facing.

Committee Work Prominent on Program

WHILE the arrangement of the convention program this year resembled that of previous years in most respects, certain worth-while improvements were made. Presentation of reports of certain committees of the affiliated associations at the sessions of the American Association tended to draw a larger number of delegates to the general meetings and to secure wider attention for the excellent work these committees are doing. Discussion of topics of broad interest at the meetings of the affiliated associations encouraged the attendance of a considerable number of the higher executives.

Some criticism was voiced, however, because of the overcrowded condition of the program. Since the general sessions of the American Association lasted longer than was expected and planned, the schedule for the rest of the day was somewhat deranged. Most of the luncheon conferences were late in beginning and even later in closing. This in turn delayed the start of the afternoon sessions, so that it was difficult to complete the day's business in the time available.

Improvements Developed Will Continue Effective in Better Times

SUMMARIZING the impressions of this year's convention, the local transportation industry is seen in a thoughtful and earnest frame of mind. But the attitude that is being taken is distinctly hopeful. The attention being concentrated on the most pressing problems—fares, equipment, schedules and traffic regulation—shows that the industry is not standing still. On the basis of actual experience, plans are being worked out that will improve conditions and methods. Many of the delegates reported beneficial results from such improvements as already have been put in effect—improvements that are more than methods dictated by mere expediency.

While general business conditions remain as unsettled as they have been recently, it is too much to expect a marked improvement in the situation of the transportation companies. But transportation men can and do expect better times, and they are now making plans through both management and methods that should redound greatly to the benefit of the industry, when the inevitable upturn from present subnormal conditions sets in. The close of the convention left both the operators and the manufacturers with a decided feeling of renewed confidence and faith in the future prospects of the industry.

Newly Elected Presidents

of the

AMERICAN and AFFILIATED

ASSOCIATIONS



G. A. Richardson

American Association

Guy A. Richardson, elected president of the American Association, is vice-president and general manager of the Chicago Surface Lines, one of the most exacting posts in the field of transportation the world over. He has had wide experience as an operator in city, suburban and interurban service, although in recent years his work has been largely with properties of the first magnitude rendering city service. In all its fields of endeavor, operating, mechanical personnel and public relations, the Chicago Surface Lines has been most successful. The association is assured in Mr. Richardson, as its president, of the same broad sympathy and understanding being brought to bear on its affairs that has characterized his previous work in its behalf as a committeeman and as an officer.

C. H. Jones, elected president of the Engineering Association, is general manager of the Chicago, South Shore & South Bend Railroad. He is an engineer turned executive. And his accomplishments as an executive are reflected in the excellent record made by his company in a field in which it has been unusually difficult to establish a record in the last decade. It was under his direction that the road was returned the winner in the Coffin prize contest in 1929. Mr. Jones would be the last man to lay claim to the accomplishments of that road, but it does remain a fact that he was one of the chief operating officials of the company under whom its activities were co-ordinated so successfully.

J. W. Giltner, elected president of the Claims Association, has recently been advanced from chief claim agent for the transportation companies centering at Akron, Ohio, to general claim agent of the Penn-Ohio Transportation System. His connection with the electric railway industry dates from 1907, when he joined the claim department of the Indiana Union Traction Company, Anderson, Ind. He has also served in railway claim work at Portland, Ore., and at Pittsburgh, and in accident insurance claim work. It has been said of Mr. Giltner in his own company that he has all the virtues of his predecessors and few of their faults.



C. H. Jones

Engineering Association



R. N. Graham

Transportation and Traffic Association



J. E. Heberle

Accountants' Association

J. E. Heberle, elected president of the Accountants' Association, is assistant to the president of the Capitol Traction Company, Washington, D. C. Well schooled in commercial subjects, including accountancy, he became stenographer-clerk in 1908 to J. H. Hanna, who was then assistant chief engineer and is now its president. So well rounded has been his training that Mr. Heberle has turned his talents successfully to a myriad of problems. "Ask Heberle, he knows," has become a slogan in Washington. And his wide experience has been most helpful in the work of the Accountants' Association, the Engineering Association and the Transportation and Traffic Association. He advanced from chief clerk of the engineering department to chief clerk and statistician, to assistant secretary and finally to assistant to the president.

R. N. Graham, elected president of the Transportation and Traffic Association, is vice-president and general manager of the operating units of Transportation Securities Company, a subsidiary of the Commonwealth & Southern Corporation, operating at Youngstown and Akron, Ohio. Penn-Ohio, as the system is called, has been honored three times with highest national awards. It received the Coffin medal in 1926, and its largest operating unit, the Youngstown Municipal Railway, received the award again in 1930. The Brady safety medal went to Penn-Ohio in 1927. Mr. Graham is a lawyer turned executive.

Fifty Years of Service and Readjustment

By

J. H. HANNA

President American Electric Railway Association
President Capital Traction Company

THERE is no law in the broad scheme of life so changeless as the law of change. Civilized people demand progress in their methods of living. The local transportation business has lived up to the demand for change throughout its history of 100 years, and particularly since the founding of the association 50 years ago. The addresses at the first convention in Boston in December, 1882, exhibited a clear understanding of the street railway man's responsibility as a public servant and a wide grasp of the economic and social problems which local transportation must aid in solving. The need for change was clearly apparent to the speakers.

The five decades which have passed since that convention in Boston have been marked by five distinct phases in the history of local transportation. The first was that of experimentation. The industry was searching for the best tool. It was found in the electric railway system.

The '90's were the era of development and rapid growth. In two years, electric railway mileage had grown from 29 to 1,260. After ten years, electric railway mileage had increased fifteen-fold and constituted 95 per cent of the total. But the industry did not merely grow in size. The car and motor of 1900 were vastly different and much improved over those of ten years before.

The following decade was the era of prosperity and substantial but slackened growth; track mileage increased 82 per cent and the number of passengers carried and the value of road and equipment were approximately doubled. While operating revenues in this period increased 129 per cent, already the effect of longer hauls and single fares was appearing, and net income after operating expenses grew but 123 per cent. Engineering developments continued but consisted chiefly of refinements and improvements in designs already stabilized.

Having put its business on a sound foundation both financially and mechanically, the industry as a whole began to take stock of itself and brought about a complete reorganization of the association. Under the presidency and leadership of W. Caryl Ely in 1905

the present form of organization of a parent and affiliated associations was set up, permanent offices under a full-time secretary established in New York, and the interurban railways recognized by the change of name to the American Street and Interurban Railway Association. At the 1910 convention, the rather cumbersome name of the association was changed to that now used.

The fourth decade of our association's history must be marked as a period of changing conditions and, in many instances, serious financial difficulties. No longer could the business be classed as a monopoly. The vast number of automobiles brought personal transportation within the reach of millions of people who formerly depended upon mass carriers.

While undoubtedly much loss in revenue had already taken place due to automobile competition, the matter does not seem to have been seriously considered by electric railway men until about 1915, when the so-called "jitney" appeared and quickly spread over the whole country. The jitney was quickly followed by motor-driven buses. While the use of buses was at first contested by many street railway operators, the more farseeing soon realized that the bus offered a new but useful means of serving the public, and in a few years it was adopted by the industry as an additional means of rendering service. Again, the electric railway men, like their predecessors, recognized the law of change and showed their willingness and desire to furnish the public with any form of transportation which might best suit its needs.

The last ten years of our association's history has been a period of readjustment and rehabilitation. Many changes have taken place. For the first time electric railway men began to realize the necessity for merchandising their service. The association's activities were largely revolutionized, and thorough scientific investigation of all phases of the industry have been undertaken. The outstanding achievement of the association during this period was the formation of the Advisory Council by John N. Shannahan, while he was president of the association, in December, 1924. The establishment of the

Council and the appointment of a managing director greatly expanded the nature of the service which the association rendered.

The law of change still goes on. This great industry is no longer merely the electric railway industry, but is the agency which must be ready to furnish mass transportation to the inhabitants of our cities by rail, by electric or gasoline bus, or by any other means which is now or may eventually be available.

The Presidents' Conference Committee, by means of a scientific investigation such as never has been attempted before, is developing the ideal street car which will give a new kind of service, which the people demand, at a lower cost. A similar investigation is under way through association activities to determine what nature of fare structure will best suit present-day conditions. Many other important problems, such as employee relations, traffic congestion, and taxation, are receiving the same thorough consideration by association committees.

It can be stated without question that the service which we render is a necessity and that mass transportation is an essential industry. Recognizing this fact and also recognizing that existing conditions are entirely unsatisfactory from every viewpoint, it becomes the responsibility of the owners and operators of the companies now furnishing transportation service to show the way out of the wilderness.

Some of the requirements for improvement are:

From the companies—first, better and more economical cars, furnishing a faster and speedier service than that now generally offered; second, a well-balanced financial structure with obligations not in excess of physical assets; third, a fare structure which will more nearly distribute the cost of the service in proportion to the benefits rendered and which will attract the profitable non-rush and short-haul rider.

From the public—and its help must be obtained through the activities of the companies themselves—first, a definitely fixed franchise or operating agreement which shall assure such stability to the undertaking that new capital will be available; second, sympathetic regulation which, while thoroughly protecting the interests of the public, will allow freedom to management, and give co-operation with them wherever possible; third, relief from all special taxation and in some instances, no doubt, definite financial help.

If the co-operation of the business men, of regulatory bodies, of the press, and of the public generally, is obtained, this great industry will pull itself out of its present difficulties and live up to the long line of successful achievements in serving the public, which have marked its history for the 50 years just behind it.

Broad Aspects of Transportation

Discussed by American Association

KEEN interest in a variety of broad problems now facing the local transportation industry was shown by the large number of delegates attending the general sessions of the American Association. The activities of this association commenced with a general session on Monday morning in the auditorium ballroom. President J. H. Hanna called the meeting to order and introduced Joseph B. Perskie, city solicitor of Atlantic City, N. J., who spoke a word of welcome to the convention and delegates, to which Mr. Hanna responded on behalf of the association. The president then gave a historical review of the industry's service and readjustment during the past 50 years, concluding with a number of recommendations for the industry's development in the future. He called attention particularly to the need of further studies on franchises, fare structures, engineering research, modernization and merchandising methods. An abstract of Mr. Hanna's address will be found elsewhere in this issue.

Joseph P. Day, prominent in real estate activities in New York City, discussed the relationship between transportation and urban property values. "Public transportation," he said, "is the key to real estate values in every city from New York to San Francisco. Our most successful real estate operators do not wait until rapid transit facilities are completed before making their land investments. They buy strategic locations in outlying sections knowing that when public transportation catches up with population growth, the value of their investment will have multiplied many times over." Mr. Day discussed traffic problems and told the part transportation has played in aiding in the decentralization of our larger cities.

Merle Thorpe, editor *Nation's Business*, Washington, D. C., prefaced an address, on "Keeping Open the Arteries of Trade and Commerce," by interpreting the factors which are influencing present economic conditions. He recommended a revision of individual and collective mental attitudes, aggressive salesmanship and a decrease in the hope of relief by government. Mr. Thorpe urged that the energy of the American Electric Railway Association be devoted to the education of public opinion. "Car riders, industries and business firms view with an unsympathetic eye the problems of this great industry," he said. "The street railway invest-



J. H. Hanna
President

ments are in an unstable condition. Great difficulty is experienced in obtaining new capital, and a large proportion of the few improvements that have been possible during the last few years has been financed out of earnings or through unsecured loans provided by stockholders. They forget that, despite the enormous increase of automobile ownership, the street railway still carries 75 per cent of all the people transported within large cities. They forget there is invested approximately \$5,500,000,000 in the securities of these companies. They forget the industry ranks eighth in the amount of invested capital in the United States. They give time, thought and attention to the difficulties of the textile industry, the coal industry, the oil industry, but they take your industry for granted.

"If the public would regard your problems with a purely selfish interest, would realize that it is a national industry and not local; if it would approach local problems with this broader outlook, such an outlook would greatly benefit the public. It is not alone the preservation of a \$5,000,000,000 investment. The problem is much more far-reaching than that, because as the investment is impaired, billions of dollars of real estate and business will be affected. The hope lies in a better understanding of the complexities of

city transportation on the part of the public and the public's officials." Mr. Thorpe's address is abstracted more fully elsewhere with this issue.

The report of the Committee on National Relations was presented by C. D. Cass, general counsel A.E.R.A. Mr. Cass described the activities of the Washington, D. C., office during the past year, and the present status of legislation which is of interest to the transportation industry. An abstract of the report appears elsewhere in this issue. He particularly called attention to the order recently handed down by the Interstate Commerce Commission in the matter of depreciation for steam railroads and telephone companies. This decision prescribes the classes of property for which depreciation charges may properly be included under operating expenses, and the percentages of depreciation which shall be charged with respect to each of such classes of property; and prohibits the carriers from charging to operating expenses any depreciation charges other than those prescribed. All carriers subject to the jurisdiction of the Interstate Commerce Commission may eventually be subject to this requirement of law, Mr. Cass said, and the recent order of the commission affecting the telephone companies and the steam railroad companies is the first normal step in the application of the statute to all carriers under the commission's jurisdiction. Mr. Cass believes that the final attitude of the Interstate Commerce Commission in this matter will no doubt be adopted and utilized as a standard by various State commissions in dealing with the purely intrastate electric railways and other public utilities within their respective States. He looks for a final standardization, nation-wide in extent, affecting all utilities subject to commission regulations in the matter of depreciation and depreciation accounting.

Mr. Cass pointed out that the purely intrastate carriers not now subject to the jurisdiction of the Interstate Commerce Commission are vitally interested in the subject matter of depreciation, as well as are the electric railways engaged in interstate commerce, and reporting to the commission. "I call this to your attention," said Mr. Cass, "because I think that there must be some very careful, painstaking, serious thinking in regard to this subject, not only by those who will be directly and immediately affected by an order of the Interstate Commerce Commission issued

in respect of depreciation and depreciation accounting for electric railways, but also by the intrastate and purely urban carriers who consider themselves remote from the jurisdiction of the Interstate Commerce Commission, and who have been happy and contented that they were so."

The second session of the American Association, held on Wednesday morning, opened with a report of the Committee on Revision of Constitution and Bylaws. G. A. Richardson, vice-president and general manager Chicago Surface Lines, presented this report, an abstract of which is given elsewhere. Following Mr. Richardson's report, a resolution was presented by J. N. Shannahan, chairman the Advisory Council, for the appointment of a special committee to assist in the preparation of a brief on the subject of mass transportation, to be presented in behalf of the association to the United States Chamber of Commerce. The Chamber issued an invitation to the association to co-operate in this matter, and assist it in its general study of transportation throughout the country. Mr. Shannahan's resolution was unanimously adopted.

Francis X. Busch, formerly attorney for the city of Chicago, addressed this session on the subject of public relations of transportation. He dealt principally with conditions in Chicago, and emphasized the value of rendering a constantly improved service as the greatest factor in any public relations program. He paid a compliment to the present Chicago transportation management and their application of this principle, and told how it was reflected in the public approval of the new co-ordinated transportation scheme for that city. Mr. Busch's address is abstracted on a following page.

Dr. Thomas Conway, Jr., president Cincinnati & Lake Erie Railroad, and chairman of the Electric Railway Presidents' Conference, opened a discussion on the activities of that body by summarizing its organization and present status. He told, in a general way, of its activities for the past year, of the work it is doing in its field laboratory in Brooklyn, and its general program for future work. He then introduced C. F. Hirshfeld, chief engineer of the conference, who addressed the meeting on the subject of "Progress Toward Improving the Street Car." Mr. Hirshfeld described the work which is in progress in Brooklyn and the organization of the personnel doing this work. His report is abstracted on another page. His address was accompanied by a motion picture film which showed the use of several precision instruments developed for the measurement of distortion of car bodies under various loads. The film also showed the construction and application of a trailer equipped with a photo-

electric device for measuring voltage, main current, acceleration, distance and time elapsed. It illustrated studies being made of the effect of acceleration on passengers, the reduction of noise, illumination, ventilation and the action of various members of a car in motion.

The third general meeting of the American Association was held on Thursday morning. Charles Gordon, managing director A.E.R.A., was the first speaker. He summarized his activities as managing director during the past two years and described the functioning of the association's personnel. His address dealt particularly, however, with a review of the convention's accomplishments, and referred to the valuable reports submitted by the committees of the various associations during the year.

Joe R. Ong, chairman Committee on Operating Economics (Transportation and Traffic Association), spoke on the control of economic factors in operation. Discussing the economics of electric railway operation, Mr. Ong said: "During the War, when the necessity for co-ordinated effort between different armies was paramount, it was found necessary to have liaison officers. There was some such thought in the minds of those suggesting the needs for a committee on operating economics. This committee, while not intending to encroach upon the subject normally within the scope of other affiliated associations, must of necessity touch upon many items that may appear to overlap in order to co-ordinate the subjects properly.

Mr. Ong discussed the necessity for increased speed, the rider's demand for modern design and comfort in equipment and the securing of fare structures which will increase revenue. He listed examples of traffic-stimulating programs carried on by many companies. His address is published in greater detail on a following page.

James W. Welsh, chairman Committee on Economics of Rolling Stock Application (Engineering Association), discussed the economic considerations in the selection of a vehicle. Mr. Welsh described his message as a guide to the selection of the best forms of transportation to meet the diverse conditions existing on various properties. Mr. Welsh's discussion on vehicle analysis and the determination of costs appears elsewhere in this issue.

E. J. McIlraith reported for the Committee on Street Traffic Economics, and Leslie Vickers, economist A.E.R.A., reported for the Committee on Fare Structures. Abstracts of these reports will be found elsewhere.

Awards for the Anthony M. Brady safety contest and the *Electric Traction* speed contest were made at this session. In the absence of Arthur Williams, president American Museum

of Safety, Guy C. Hecker, general secretary, A.E.R.A., made the Brady awards. Edward Dana, manager of the Boston Elevated Railway, received the medal and certificate for the winner in the large-city class. John Ross, chief engineer, Department of Street Railways, Detroit, accepted the certificate of honorable mention in the large-city class. In behalf of the Calgary Municipal Railway, K. B. Thornton, president of the Canadian Electric Railway Association, accepted the medal for the winner in the small-city class. R. N. Graham, vice-president and general manager Youngstown Municipal Railway, received the certificates of honorable mention for his company in this class. No award was made in the inter-urban class. A separate article in this issue deals with the Brady contest.

T. Fitzgerald, chairman of the Speed Contest Committee and vice-president of the Pittsburgh Railways, awarded the silver cup to the Chicago, North Shore & Milwaukee Railroad. S. A. Morrison, assistant general manager accepted for the company. Honorable mention was given to the accomplishments of the Cincinnati & Lake Erie Railroad; the Chicago, Aurora & Elgin Railroad, and the Milwaukee Electric Railway & Light Company.

A report of the Committee on Resolutions was made by D. W. Pontius, president Pacific Electric Railway. The following officers elected during the Wednesday morning session were installed for the ensuing year.

President—G. A. Richardson, vice-president and general manager Chicago Surface Lines.

First Vice-President—J. H. Alexander, president Cleveland Railway.

Second Vice-President—Walter A. Draper, president Cincinnati Street Railway.

Third Vice-President—W. E. Wood, vice-president Engineers Public Service Company, New York City.

Treasurer—Barron Collier, president Barron G. Collier, Inc., New York City.

For operating members at large of the Executive Committee for the three-year term expiring 1934:

A. B. Patterson, president New Orleans Public Service, Inc.

Robert M. Feustel, president Indiana Service Corporation, Fort Wayne, Ind.

For manufacturer members at large of the Executive Committee for the three-year term expiring 1934:

M. B. Lambert, assistant to vice-president Westinghouse Electric & Manufacturing Company, New York.

H. E. Listman, vice-president General Motors Truck Company, Pontiac, Mich.

John B. Tinnon, sales manager Metal & Thermit Corporation, New York City.

For operating member at large of the Executive Committee for a one-year term:

A. M. Hill, president Charleston Inter-urban Railroad.

Improving the Street Car

By

C. F. HIRSHFELD

Chief Engineer
Electric Railway Presidents' Conference Committee

EVERYBODY knows that the street railway industry is sick. You know it, the banker knows it, the public knows it. The symptoms of the disease are very evident. Income is not sufficient to balance all proper costs and yield a reasonable profit. Thus far all agree. But when it comes to diagnosing the case, when it comes to accounting for the symptoms displayed by the patient, the doctors disagree.

It must be admitted that the patient is already an elderly gentleman. He has not always been in the most perfect health, but until recently the troubles were confined to isolated spots. Now the patient seems to be suffering from some sort of general complication of troubles which is rapidly sapping his vitality.

There is one group of doctors who quite cold bloodedly maintain that the dear old gentleman has served his useful life and is now ready for the industrial scrapheap. Those who have thus given up the patient seem to comprise on the one hand learned and able men who do not have much time to devote to this rather unpromising and not overly remunerative patient, and on the other hand rather young practitioners who are inclined to jump at conclusions without giving adequate study to the subject and his symptoms.

Another group believes that although the patient is suffering from a serious ailment, he is still a very necessary member of the community and that he can be cured by proper treatment. Unfortunately the doctors in this group differ among themselves as to just what is the basic trouble and what curative remedies should be used. Thus there are some that insist that the old gentleman's diet is entirely wrong; that he change his diet, that is adopt a different fare system. There are others who claim that he is simply dissipating his strength and nervous energy by attempting to cover too wide a field of activity. They advocate that he concentrate on the heavier tasks and permit younger and more agile individuals to handle the lighter ones. Another group insists that the clothing which the patient wears in public is all wrong, reflects the customs of a bygone generation, affects his health by giving him an inferiority complex, and places an unnecessary and very heavy load upon his remaining energies. Some would have him wear light-weight and bright-



C. F. Hirshfeld

colored clothes in place of the heavy and somber raiment of which he is so fond. Others would have him merely adopt rubber heels. And so on through a long list.

When doctors disagree the patient suffers, and he has done so in this case. However, there is still hope, because a far-sighted group, after studying this patient and his activities, has concluded that he is not incurably ill, that he still performs a very useful function in the community, that he can be put into condition to become self-supporting, and that he will be saved if it is in their power to save him. They are wise men and have determined to consider all means of influencing his health, not to confine themselves to one or another pet hobby. They have therefore divided themselves up into commissions of committees, and each of these units is busily studying what has been assigned it. One has taken the condition of the patient's blood stream, another the way in which he orders his daily life, another his diet, another his clothing, and so on. They believe that, if they can assemble all the facts about this patient, he himself will have sufficient intelligence and ability to cure himself under proper medical guidance.

It is my privilege to outline the plans and activities of one of these committees, specifically the one which is studying the old gentleman's clothing in which he appears in public, and by which the public judges him. This committee suspects that his present antiquated garb not only places an unnecessary drain upon the patient's energies, but that it also causes the general public, and particularly the younger part thereof, to class him as an antique and

to pass him by, either in mirth or in pity. This particular group is called the Electric Railway Presidents' Conference Committee.

The job is to find out what is wrong with the present-day street car, to discover what is now required of a street car, and then to guide the genius and producing capacity of the industry in the design and construction of a rail vehicle suited to modern urban needs.

There are two ways of undertaking such a commission. One is the inspirational method; the other, the fact-finding or research method. We might have adopted the first and have produced within a few months a car design as different from the conventional vehicle as fertile imaginations could devise. The result would have been spectacular and the immediate cost would have been low. But the value of the product would almost certainly have been small, its chief claim to distinction would have been its novelty.

We chose instead the slower and less spectacular, but much more certain, fact-finding method. This is the method that industry has recently adopted from the scientists and which has proved so effective in improving industrial processes and products. It depends quite simply on the determination of all significant relevant facts, so that final action can be based upon real factual knowledge instead of upon more or less arbitrary decision between conflicting opinions, traditions and rules of thumb. It is our belief that if we determine and publish the necessary facts, the brains and genius already in the industry will prove competent to take advantage thereof in the production of new designs.

The fact-finding method is not necessarily experimental. In this case it involves complicated analytical work and the compilation of statistical information, in addition to test and experiment. The test program constitutes, however, the largest part of our fact finding. It includes among other things the accurate determination of the characteristics of present available cars and equipment. For this purpose we have set up a field laboratory on the property of Brooklyn & Queens Transit Corporation.

We must use the modern car as a point of departure. We want to know just how strong it is in different respects and whether any of the component parts are stronger than they need be or weaker than they should be. The car body is treated as a box girder and subjected to loads which simulate those experienced in use.

But we must not confine our attention only to the car body. The trucks represent a large part of the weight and of the cost, and they are of outstanding importance with respect to performance. Therefore we are studying the truck experimentally just as we are studying the car body.

Another thing that we want to know is how a modern car starts and comes up to speed—that is, we need the time, distance and force relations. We are using an entirely new method for this purpose and it is giving us very exact data.

Ultimately we hope to produce a car which will start and stop as readily as possible. But what do we mean by this? Among other things, we mean as rapidly as the passengers can tolerate. No one knows just what passengers can tolerate and therefore we have in progress at the University of Michigan experiments to determine the facts.

Our investigations indicate that noise reduction is one of the most necessary improvements. In fact, complete elimination is the ideal to be approached as nearly as possible. If we are to approach such an ideal it is not sufficient to measure only the volume of noise. We must break the total volume down into a noise spectrum, determine the frequencies which are responsible for the greatest volumes, and then run these frequencies down to their sources.

During recent years the illumination of street cars has been given much

thought. We are measuring the intensity of illumination in different typical modern cars, and we are also obtaining data from which the expectable characteristics can be determined in advance with greater precision than is now possible.

Discussion with car riders has brought out the fact that better ventilation is highly desirable. Therefore, much work is being done on this subject. The ventilation of the car is studied by creating in the car a uniform mixture of carbon dioxide and air within it, and then determining the rate at which the carbon dioxide disappears under different operating conditions.

We realize fully that both funds and time are limited; we realize that our major task is the production and proof of a greatly improved car; we realize only too well the imperative need of haste. Of necessity, our first efforts must be experimental, that is, fact finding in character. Similarly, our first bulletins must deal with methods and later ones with determined facts. But, the entire program is planned with a view to reaching practical, usable results as quickly as possible.

stance, rather than to be so allocated on some arbitrary basis of apportionment. Such a method of fact finding is equally applicable to any form of transportation, whether composed of rapid transit, surface rail route, or trolley and gas bus operations.

This study will permit the actual cost of service, including all investment charges as well as all other expenditures, to be determined for each route. Comparing its cost thus obtained with its revenue discloses its profitableness or the reverse. The effect of such an analysis is to bring out in sharp relief the gains and losses on the system. There will be found far greater variation in the earning power of routes on the same system, than between any two systems in the country. If fares were fixed by the costs of service, route by route, almost any system would have some favored line with short-haul and dense traffic where the fare might be cut to a cent or two. Other lines would require rates as high as 25 or 50 cents. Such a fare plan would, however, soon be self-destructive, as it would be impossible to secure sufficient traffic on the lean routes in order to make them earn a reasonable return at any fare.

A striking result of the varying costs on routes is shown in the example of a system of 30 routes. The analysis discloses that only half of the routes have a cost per passenger equal to the average system fare of 8 cents. On the remaining routes, the fares would range from 7 cents to 19 cents.

When you reflect that the margin between costs and revenues is usually close, it is evident that attention paid to these losing routes might readily balance the budget without disturbing the fare on the whole system. It is not suggested that fares should actually be varied in accordance with the route costs, but when such losses are thus revealed, the desirability of considering other types of vehicles in such cases is very positively indicated.

In comparing the economic value of bus and rail car, each has one outstanding claim for superiority which the other lacks. For the rail car, its unquestioned advantage to date is its high peak-load capacity with all that entails in lowering rush-hour costs. For the bus, the absence of track investment is its high point of pre-eminence. On the investment side of the equation we find the average capital devoted to street car operation is five times its annual revenue; while with the bus the investment and annual revenue are equal; hence for the same revenue (assuming this represents equivalent capacity) the bus demands but one-fifth the capital investment of the rail car. On the basis of a 6 per cent return on the investment in each case, the bus could reach a 94 per cent operating ratio, while the electric rail car must hold its ratio down to 70 per cent.

Economic Considerations *in the Selection of the Vehicle*

Based on the report of the
Committee on Economics of Rolling Stock Application

By

JAMES W. WELSH

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FOR years the medical profession sought the remedy for the ills of humanity in cure-alls, tonics, medicines which toned up or stimulated the heart and body as a whole. It was not until Pasteur in 1876 discovered that specific bacteria were the immediate causes of special diseases that any effective progress was made in combating bodily ailments. Is not this the lesson for our industry? We must isolate the troubles, break down the problem into its simplest elements before attempting a solution.

The Committee on Economics of Rolling Stock Application believes the route or line is the starting point for such a study. Each route of the system should be segregated and set up independently for the purposes of analysis as though it were a separate company. It should have its own valuation of property devoted to transportation service and a



James W. Welsh

separate road and equipment account. After this, as far as possible, all operating and maintenance should be directly charged to the route in the first in-

Too often this whole problem is looked upon as a mere refinement and as of little practical importance when a company is harassed by many difficulties. On the contrary, what question can be of greater importance than the selection of the very mode of transportation itself; or, still more vital, whether to continue operation at all. Perhaps a part of the difficulty responsible for such a viewpoint is the unconscious assumption that any change from rail car operation presents too many diffi-

culties, both political and financial as well as economic.

Should we not think of this problem as our job to produce a unified transportation system for our communities? It would be a built-up organism composed of high-speed rapid transit lines, surface rail routes, trolley buses, gas buses, de luxe coaches and taxicabs. It would be a placing together of all forms of transportation, each the best of its kind for its place, all into one unified whole.

Public Relations of Transportation

By

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AN ARTICLE by Francis H. Sisson in the August issue of the **ELECTRIC RAILWAY JOURNAL** graphically presents a most anomalous situation in that branch of the public utility industry which he includes under the heading, "Operations of Electric Railways in Mass Passenger Transportation."

Quoting from the latest United States census of electric railways, he says that while the total number of passengers carried by electric railways increased nearly 300 per cent in the 25 years from 1902 to 1927, and while the number of car-miles operated and the amount of invested capital were doubled, the net return, after deducting operating expenses, including taxes and municipal impositions, declined from 5.3 per cent in 1902 to 3.1 per cent in 1927.

Despite the essential nature of passenger electric transportation—14,500,000 customers served yearly—a service without which the cities of our country could not exist—it is generally conceded by well-informed persons that the operation of passenger electric street railway transportation, even with the supervising regulation of rates by public utility commissions, does not offer a field of investment as attractive as that to be found in other utilities and in industry generally.

Mr. Sisson, after ascribing the almost uniform lack of satisfactory earnings by the country's mass transportation agencies to higher operating costs and increasing automotive competition, stresses the fact that one very important cause of the difficulties of electric railway companies has been the oppressive and arbitrary treatment they have so

often received at the hands of public officials.

Public support, through an adequate franchise and sympathetic understanding and co-operation of public officials, is indispensable to a successful management of a public transportation system. Prosperity for the industry cannot exist without this support and co-operation. In this connection Chicago furnishes, as the doctors would say, "some splendid clinical material."

In May of 1930 the City Council of Chicago passed, and the people at a referendum in July approved by a vote of more than five to one, an ordinance granting to a company which is to acquire all the existing surface and elevated railway properties, an indeterminate franchise upon terms which will permit the consolidation, refinancing and extension of the present properties, including subway construction to be financed wholly by the city through special assessments, the accumulated

traction fund, or general bonds. The ordinance further provides, not for a fixed and unchangeable rate of fare, but for the charging of a rate of fare to be determined by the lawfully constituted regulating authority, sufficient to produce a reasonable return on the capital invested. It is an ordinance which deals justly with the city and the utility and is in accordance with recognized sound economic principles.

Taken by itself, there is perhaps nothing particularly significant in this statement. However, when it is considered in the light of the fact that the preceding traction ordinances, passed in 1907, were twenty-year franchise grants definitely providing for and contemplating acquisition of the properties by the city for municipal ownership at the end of those grants, and when it is further considered that for more than 25 years—from 1897 to 1923—the public attitude towards Chicago traction managements had been one of suspicion, distrust, and unbroken hostility, there is indicated a reversal of public opinion so complete that a search for its cause should be profitable.

During the period from 1897 to 1907 it was declared on every hand that Chicago's traction system was controlled by a defiant and corrupt management, which furnished the most inadequate and inefficient transportation to be found in any large city in the United States. The hostility of public sentiment toward the traction companies was repeatedly reflected in political campaigns and municipal policies. Carter H. Harrison was elected Mayor in 1897 on an anti-traction franchise issue. He was re-elected on variations of that issue in 1899 and 1901 and 1903. A strong sentiment for municipal ownership and municipal operation developed during this period. In 1905 Judge Edward F. Dunne, an out-and-out advocate of municipal ownership and operation, was elected Mayor.

It was in this atmosphere that the 1907 street railway ordinances were prepared. Among other things, these grants provided for a division of the net receipts of the operation of the properties. The city was entitled to receive 55 per cent of all net annual receipts remaining after the payment of operating expenses and a fixed return of 5 per cent per annum upon the capital value of the traction properties. This was expected to create a fund with which the city might, either before or at the expiration of the grant, purchase the properties for municipal ownership and operation.

In the eight-year period following 1907 \$91,000,000 was spent for additions and betterments, which laid the solid foundation upon which was later built the finest electric surface railway system in the world. Prompt and faithful compliance by the companies (until



Francis X. Busch

prevented in 1915 by World War conditions) with the provisions of the ordinances for building extensions and betterments undoubtedly mollified to some extent general public distrust of the railway managements, but sentiment on the whole continued antagonistic.

The 1907 ordinances were undoubtedly the best ordinances obtainable at the time of their passage. As the years passed, however, unforeseen changes developed, due to the widespread use of the automobile, the new competition in buses and transportation, and advancing costs due to the high price levels of the war and post-war periods.

By 1918 it was obvious alike to the city and companies' representatives, in view of Chicago's traction history, and with a franchise expiring in less than ten years, that the financial demands for necessary extensions and betterments of the street railway system could not be met. An attempt was made to agree upon a new franchise. In spite of practically unanimous newspaper support a proposed ordinance was defeated at a referendum, largely because of the expressed distrust of the then management of the properties.

Such was the state of affairs and such the state of public opinion when, in 1923, the active management of the Chicago Surface Lines (operating all of the electric surface railways in Chicago) was changed. The change developed an immediate improvement in scheduled service, instituted better supervision and therefore more dependable operation. As the public found less crowding, greater regularity, and less of a "devil-may-care" attitude on the part of the men, the citizens began to manifest a kindlier attitude toward the company.

Almost simultaneously with the change in company management came a change in city administration. Another effort was made to "settle the traction question." Another ordinance was drafted providing for the immediate vesting of title to all of the traction properties (surface and elevated) in the city. The city was to give in exchange for the properties certificates bearing 5 per cent interest, payable, as to principal and interest, out of the earnings of the properties. The city by the ordinance obligated itself to maintain a rate of fare sufficient to meet operating expenses and provide for the amortization of the certificates. The ordinance was overwhelmingly defeated. Political groups antagonistic to the administration feared that the fare would have to be largely increased to meet the obligations of the ordinance. Opposition of radical groups that it did not provide for more immediate municipal operation, and opposition from a growing element opposed to either municipal ownership or operation, combined to bring about its defeat.

In 1930 the company asked for per-

mission to install trolley bus service. The trolley bus showed such superior riding qualities and passenger convenience that the public officials were at once impressed with the progressive ideas of service and equipment shown by the company. The Chicago public now feels that it can look to its transportation company to keep fully modernized and give appropriate service as conditions develop.

A willingness on the part of the management of the companies to participate in programs of improvement; to co-operate with city officials in the settlement of problems where the knowledge or skill of its employees may prove valuable; to render continuously to its patrons, with a respectful group of contented employees, the best service of which its property is capable; to meet and discuss frankly and fairly, either before regulatory bodies or in the company's offices, the unjustified as well as the justified complaints of citizens or citizen associations—this conduct reversed the public sentiment of Chicago as it existed prior to 1923.

It is one thing merely to operate a transportation system. It is quite another thing to operate a transportation system so that the public that is served is satisfied and possessed of such confidence in the management that it is willing to extend its operating rights in the confident hope that it will receive even better service. Therein rests the job of management—to do its daily job well, to apprehend and meet extra demands put upon the service, and to interpret correctly the needs of the hour in transportation. There also is the key to satisfactory public relations. Direct relationship with the public occurs on one or two occasions during each day when your equipment and your operators carry one member of the public to or from his home. No other utility affords such intimate contact. It is this contact which forms individual opinion. It is the multiplication of these individual opinions which molds public opinion. It is an appreciation of this fact by the management of the electric railways in Chicago that has made this story possible.

Determining Relation Between PRICE *and* PATRONAGE

Based on the report of the
Committee on Fare Structures

By

LESLIE VICKERS

Economist
American Electric Railway Association



Leslie Vickers

THE one great problem in fares today is how to fill up the empty seats that most of our systems have in the off-peak hours. In other words, what we need is a fare that will improve the load factor. Cities may be

able to do something to help us by staggering the hours of work, etc., so that our peaks both morning and evening will be spread out over a longer period, but we must help ourselves in the matter of getting revenue out of the seat-miles which have to be operated if we are to maintain a public transportation system at all.

Because we know so little about matter connected with fares the Fare Structures Committee of the American Electric Railway Association was called into being. Its task is to try to formulate the principles which should govern the establishment of fares, and to do this it must study the history of fare changes in the past and, at the same time, conduct on its own account or encourage the conduct of such experiments throughout the country as will give it a basis of experience in the present day.

Undoubtedly the two main factors to

be considered in a discussion of fares are the cost of rendering the service to the company which performs it and the value of the service rendered to the person who buys it. We deal with masses, not individuals. We cannot say that this customer costs us so much and that customer costs us a certain other amount. It is difficult for us to tell how far they ride or to determine the limits of the groups which we call peak riders, for whom our cost of service is undoubtedly high. Unlike the gas and electric and other industries, we have no exact metering device, and the best that we could do if our fares were to be determined on the cost to us would be to set up arbitrary distinctions.

We know that it costs more to carry a passenger in the peak hours than in the off-peak hours. Then, too, we know that it does not cost us as much to transport a passenger in the reverse direction as it does in the direction of the main traffic flow. We are rapidly coming to the conclusion that the distance which a passenger rides is one of the least important elements in our costs in urban service. On the other hand, the length of line provided, together with the number of cars which must be in service on that line, is very important.

We must never lose sight of the fact that while the cost of the individual service may be of importance to us, of far more importance to the user is the value of that service and of the ease of substituting something else for it. If he won't patronize it at the price we charge, we may have to reduce the price as most sellers of commodities have to do. We must find the price that he will pay. We can no longer consider our customers as a group which put one single value on the service that we have to sell but as a mass divided up into a great number of groups who set different values upon it. If we cannot sell all of our goods on the main floor, let's put some of them down in the bargain basement and reduce the price to move them. Our service is a perishable service. Once the street car has moved along on its journey, the service which it had for sale on that trip can never again be offered. Those empty seats have been offered without takers. Our job is to find a fare structure which will sell a greater part of our service, popularize public transportation and provide us with funds to enable us to keep on improving the only thing we have to sell—namely, *service*.

There seems to be little dispute now that the casual rider or the one who patronizes the service just occasionally should pay the maximum rate. There seems to be agreement also that the wholesale rider should be recognized as such and a concession granted to him even though he is usually a patron at a time when it costs most to serve him. There is a growing conviction in the

industry that we must coax the public back to the use of our service at off-peak times by some kind of price concession, and while no one is in a position to present a formula universally applicable to bring this about, such experiments as those of Milwaukee, Boston, Gary and Cleveland, to mention only a few companies, have done much to show us the way to better merchandising.

While, generally speaking, it takes only two people to make a bargain, in the electric railway industry it takes, as a rule, three. When a large department store decides to change its merchandising policy, it marks down its goods, advertises the sale and clears the shelves. When we decide on a change of price, we usually have to go to a commission and obtain permission to do so. Some of these regulatory bodies, notably that in Wisconsin, are fully alive to the necessity of quick

action and of sympathetic action, and part of the success of the Milwaukee Company is due to the ready assistance which the Wisconsin Commission has given to it. But not all commissions are of this type. One of the tasks which lies immediately before us is that of convincing the commissions of the desirability, from a public standpoint, of allowing considerable latitude in fare structures and opportunity for experiment.

We do not propose to wait until we have the ultimate solution of the fare problem. We propose to help companies to find that solution for themselves and to put into practice right away, if not the best method which may take us years to discover, at least a better method, and one which gives promise not necessarily of an immediate increase in net, but of an increase in patronage from which an increased net will ultimately and inevitably follow.

Keeping Open the Arteries of Trade and Commerce

By

MERLE THORPE

Editor *Nation's Business*



Merle Thorpe

FACTS are the least developed of our natural resources. Fallacious thinking is responsible for most of our present problems. It follows that remedies for relief are largely the result of starting from the wrong premise, from an unreal situation set up by rumors, half-truths or downright misrepresentation. Whole sections of our industrial life suffer today from industrial fallacies of the past. Perhaps none has suffered more than transportation, particularly electric railways.

Popular fallacies about business are born of old wives' tales, of honest half-truths, of political expediencies, of mis-

used statistics. Parenthetically, nothing is so dangerous as a perfectly good "statistic" in the hands of an amateur. It becomes a national menace in the hands of a demagogue.

It will take only a little commonsensical reflection to understand that "the public be damned" fallacy of 30 years ago was not, nor could it be, the attitude then or now of our public utilities. Yet, from that fallacious premise, and others, have sprung misunderstanding, suspicion, distrust and reprisal, which have taken the form of confiscation, operation, regulation, supervision and a thousand obstacles in the way of efficient operation.

The electric railways got the backwash of this popular antipathy. As a result, the transit facilities in most of the larger cities of the country have fallen behind the standards for other phases of modern urban life. The unwillingness of the people and the people's representatives to co-operate wholeheartedly in solving the problems of mass transportation has brought its own penalty—the penalty of inconvenience, crowding and dangers encountered in using transit facilities, or experienced when walking or driving in congested traffic areas. At the same time, the users of these facilities, whose interests were always brought to the

fore by "friends of the people" are aware that while the service afforded them has decreased, the price they pay has invariably increased.

We pride ourselves on being a highly intelligent people. Yet the charge still stands that we are a nation of economic illiterates. An example is present in your industry. Business interests and the newspapers, which should foster the freest exchange of commodities and services, should approach traction problems with a sympathetic interest toward their proper solution, but instead they have been indifferent and, in many cases, have lent themselves to partisan politics, which has retarded the growth and business activity of many communities.

Measures for better city transportation are closely interwoven with economic and political life, and require public co-operation for their solution. The problems are complicated and of a technical nature. They should be studied in the light of the community as a whole. But interests of a particular section or group, local politics, prejudice, and selfish interest have prevented, in the past, and continue to prevent, at the present time, the management from doing a real job.

Even responsible business men and property owners understand little of the great importance of local transportation in its relation to the physical, economic and social development of their cities.

Transit deficiency and traffic congestion exact an intangible yet a great toll upon their business and upon property values. Even the street car rider takes little or no interest in constructive measures which would improve the service rendered him, his comfort and convenience. He is wholly indifferent, if he is not found in the ranks of agitators, to increased taxes and expenses, subsidies to school children; yet it is he, in the last analysis, who pays the bill. His mind is full of suspicion and prejudice, because he still believes that the policy of a public utility is that "the public be damned."

Not only the street car riders—we must remember that there are 40,000,000—but the industries and retail businesses whose very lives depend upon mass transportation, are indifferent to the serious problems facing street railway service. They are quick to pick up another fallacy that the street railways are doomed, that they are back-numbers, and must give way to new forms of transportation. Yet any man in his sane mind must realize that it will be many, many years before other forms of transportation will take the place of street cars. And many, many changes will have to be made affecting the entire layout of whole cities before such can come to pass. The hope lies in a better understanding of the complexities of city transportation on the part of the public and the public's officials.

Control of Economic Factors in Operation

Based on a report of the
T. & T. Committee on Operating Expenses

By

JOE R. ONG

Director of Research
Cincinnati Street Railway



Joe R. Ong

UNDER present conditions existing in the industry, railway management should be open to the consideration of any and all suggestions which give promise of bettering the net revenue if only to a slight degree. While it is granted that measures which will prove of great benefit to one property may not be adaptable to every other property, the report of the committee on operating economics of the T. & T. Association treats the subject in a sufficiently broad manner to provide suggestions which might be applicable to almost any transportation company, regardless of size or location.

Following are some of the means used to give increased schedule speed:

1. Installation of field tap controls to speed up cars.
2. Installation of quick-acting brakes to increase braking rate.
3. Installation of electric track switches.
4. Rerouting in business sections to eliminate left turns.
5. Change in stop distances to reduce number of stops per mile. (Stop distances recommended by various companies are from 600 ft. to as great as 1,400 ft.)
6. Elimination of all layovers.
7. Combining of lines to eliminate loop mileage.

Several companies have definitely proved the value of modern equipment from a revenue-producing standpoint by comparing the riding index on lines so equipped with the riding index on lines using older equipment. One company

reports an increase of 7 per cent in riding on lines with new equipment, or about 2,000 new revenue passengers per new car per year. Other companies which have acquired new cars during the last two years report that riding has held up better on the lines equipped with new cars.

MERCHANDISING METHODS USED TO INCREASE REVENUE

Special traffic stimulators have been tried in several cities in connection with bargain days at retail stores. Some companies have worked out a joint ticket arrangement with theaters, parks, and promoters of athletic games. Others are conducting sales meetings with their employees in their endeavor to increase the sale of rides. One company presents a weekly pass to each new family arriving in the community, with a letter from the manager urging the newcomers to use the street cars, and pointing out the economy and time saved by using the convenient car service for every purpose.

Practically every company reporting has recognized the value of advertising in some form to spread the message of safety and economy in connection with their service. The use of posters and car cards is general. Most companies use newspaper space.

Several companies have increased their revenue through the development of chartered bus business. This is stimulated by the use of both direct mail advertising and posters in the cars as well as newspaper advertising.

It is more difficult to summarize the various things which have been reported as effective in reducing operating expenses. In some cases, perhaps, major reductions can be made at a single stroke, such as the introduction of one-man operation, resulting in a material reduction in trainmen's wages, or the substitution of new equipment for old resulting in a material reduction in the equipment accounts. If the new equipment permits a materially higher speed, then this will produce a further reduction in trainmen's wages.

In addition to reducing car-hours by speeding up schedules, most companies have been endeavoring to reduce total

car-miles to the lowest point consistent with public needs. Traffic checkers have been employed to make a count of the passengers at various hours of the day, and schedules have been made more flexible so that service could be adjusted to meet daily needs. Many companies have been making greater use of their cut-back facilities so that the former headways are maintained in the more thickly populated portions of the city, while service is reduced at the outer ends of the lines. One company, operating a co-ordinated service operates street cars only in densely populated areas, and uses buses to provide service beyond the limits of street car operation.

In connection with the operation of buses, several practices have been mentioned which are worthy of consideration. The use of a vehicle of the proper size for the amount of traffic on the line is mentioned as the way used on one property to stop some of the leaks in bus operation. By purchasing ten single-deck buses to use in place of double-deck buses in off-peak hours, one company has produced a saving of some \$33,000 per year. Substitution of buses for street cars at night, on Sundays and holidays, or at other times when riding is low, has produced a very satisfactory saving in operating costs in several cities.

there is good evidence that the increased crowding of the streets and the cost of travel in private automobiles is definitely limiting the utility of the private motor vehicle. As the character of the public vehicle and the service rendered by it are improved, it is not farfetched to say that the street car and the bus may in the near future be held in higher favor for the growing proportion of daily city travel.

Street crowding, often called traffic congestion, is definitely traceable to the increased riding habit in the private automobile with its higher street occupancy per passenger served. For example, a single-track street car line will carry, at about maximum capacity, 13,500 people in one direction. A similar width of pavement used by private automobiles only will carry but 1,575 people. Thus, it requires practically nine traffic lanes to carry as many people per hour as can be carried by the single-track street car line.

TRAFFIC CONTROL WILL GIVE AMPLE STREET SPACE

Yet, extravagantly as private automobiles use the pavement area in comparison to the more efficient street car, there is ample street space in every city to carry at least twice the present motor traffic with no more crowding than at present. How can this be achieved? Simply by the application of traffic control and regulation measures designed to use the street most effectively. If these are put in force, it will mean that much of the present curb parking on crowded streets will have to be eliminated, progressive traffic signals must be installed in many places, so timed as to speed up, rather than hinder, traffic movement. Many traffic signals already installed will have to be removed, and more rigid control and supervision over the least necessary types of vehicles during the crowded periods of the day must be accomplished. This is not a dream—it can be and is being accomplished. The methods used are not spectacular, they do not cost a great deal of money, but they accomplish much in saving of time and money to the citizens of a city.

Some contend that the traffic problem can only be met by wider streets, more streets, elevated highways and grade separation—all extensive structural changes. All of these devices may have some place in a comprehensive traffic plan, but neither one nor all will ever solve the traffic problem. Often they only tend to aggravate further the present congestion by encouraging less efficient street use by private automobiles. If our present street system were to be used as efficiently as it could be, keeping in mind first the reasonable needs of majority, city streets would easily be able to handle all the present traffic with a liberal factor of safety for the future.

Costs and Competition in Street Use

Based on a report of the
Committee on Street Traffic Economics

By

E. J. McILRAITH

Staff Engineer
Chicago Surface Lines

NO ONE denies that, in this period of remarkable automotive development, the private automobile has considerably reduced the number of riders on street cars and buses. Nevertheless, I am of the opinion that the effect of the automobile upon the public carrier has been largely overestimated. By far the greater proportion of all motor vehicle riding is new riding created by the automobile, and actually non-competitive in character, although it is true that much of this travel in cities could be quite satisfactorily served by public transportation. The facts are that while automobile registrations were increasing phenomenally, passengers carried on railway cars and buses of the electric railway industry of the United States were also increasing slowly to a maximum in 1926. The decrease from that time to 1930 in number of passengers carried has been only 9 per cent.

The Committee on Street Traffic Economics has conducted a study of the past history of the automobile as it has affected the mass transportation agencies, and made some analysis of what the future may bring. The era of rapid growth in the automobile field has definitely passed. Sales resistance is becoming greater, and the number of persons who may be classed as poten-



E. J. McIlraith

tial motor vehicle purchasers is becoming less each year. Since 1923 new equipment purchases in each year have been less than in the year before. This trend will continue for several years. Registration increase in the next five years will probably be only about 10 per cent, although it may amount to 20 per cent. Up to four years ago, the yearly increase had always been 10 per cent and more.

It is our conclusion, then, that the period of most serious competition from the automobile, measured in numbers of vehicles, has already been practically reached. In the larger cities, especially,



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First Vice-President



Walter A. Draper
Second Vice-President



W. E. Wood
Third Vice-President



G. C. Hecker
General Secretary

1931—1932

Vice-Presidents *and*
General Officers



Barron Collier
Treasurer

of the

American Electric Railway Association



A. B. Paterson



Robert M. Feustel



Myles Lambert



H. E. Listman



John Timmon



A. M. Hill

Newly Elected Members of the Executive Committee
All for Three-Year Terms, Except Mr. Hill, Who Serves One Year

Progress in Meeting Major Problems

Outlined at Advisory Council Session

Coffin Award Presented to Milwaukee Electric Railway & Light Company. Lack of confidence principal deterrent to world business revival, according to Julius H. Barnes

STEPS taken by the industry to solve its problems and a comprehensive outline designed to end the world depression were presented at the Advisory Council session, held at the auditorium on Tuesday night. A large crowd filled the convention hall to hear these vital messages and to witness the presentation of the Coffin Award to the Milwaukee Electric Railway & Light Company.

J. N. Shannahan, chairman of the Advisory Council, opened the meeting, and in his remarks cited the growth of the association and what it has accomplished. He discussed the problems of preserving the investment, securing credit, impressing the public with the essentiality of public transportation, street congestion, improved service, and co-ordination, and told what had been done in the past year toward solving them.

FUTURE OF THE SERVICE A MAJOR QUESTION

"It is proper," Mr. Shannahan stated, "that we should seek to conserve the large investment of the industry. The investor is entitled to fair treatment on the part of the public. Regulation by public bodies should function to permit him reasonable safety and a fair return in earnings, as well as to insure to the public reliable and convenient service at reasonable cost. Unless the former is granted, the latter is impossible. Unless the investor is fairly treated, private capital will be withdrawn to safer and more remunerative fields. Unwise public treatment can sacrifice investments already made in good faith, but it cannot force new money to be put into a public service enterprise. When that condition occurs the credit necessary for improvement and extension will not be available and the quality of service which the



J. N. Shannahan

public has a right to expect will not be possible. Our business has suffered for a number of years from lack of credit. Until at least a portion of past investments is salvaged and reasonable safety provided for the future, this condition will remain. From the investors' standpoint alone, this situation is one to challenge the attention of every fair minded and thinking citizen. But its direct public aspects are of even greater importance. The major question to which we seek to direct attention is not so much what is to become of the local transportation business, as what is to become of the service itself. This is a question that concerns the public even more than it does the investor.

"Of course, it assumes that public transportation service is indispensable and will remain so in the future. There is no need for me to establish for this audience the fact that the service of the companies represented here is a vital necessity to the millions who are dependent upon it for their daily travel

needs. But there are many in this motor age, who, not fully aware of the facts, are inclined to jump to the conclusion that street railways are rapidly outliving their usefulness. Those who hold this view do not realize that despite the widespread ownership of automobiles, approximately 75 per cent of those who travel to and from central business areas in the larger urban centers of the country are dependent upon public transportation for their daily travel needs. Nor are they aware that during the relatively short periods of maximum demand; that is, during the rush hours morning and evening when workers are traveling between their homes and places of employment, public travel facilities are even more vitally necessary than is indicated by figures based upon the total movement throughout the day.

"Any suggestion that public transit facilities can be dispensed with, even in this age of luxurious automobile transportation, is economically and physically inconceivable. No program of street and garage construction would begin to permit everyone to travel in cities by automobiles, even if we are willing to assume that they could afford to do so. The need for public transportation service in urban areas is increasing—not decreasing. Though the widespread ownership of private cars enables many to provide their own transportation, this very convenience of the automobile has created a large increase in social and economic activity and in the habit of moving about.

"Street congestion is today one of the most serious problems of the modern city. As fast as improvements are made in existing arteries they are saturated by the insistent demand for additional street space. We are convinced that the improvement of public transit to the point where the public will be wil-

ing to use it to a larger extent for ordinary travel purposes is an important factor in the solution of the street congestion problem. In fact, this seems to offer the only economically feasible method of remedying the traffic jam of modern cities and avoiding the threat to the stability of hundreds of millions of centrally located property values.

"This industry has not been sitting by waiting for others to aid in the solution of its problems. While seeking public co-operation it has been exerting itself to the utmost to put its own house in order—to improve its technique and methods to the limit of its financial ability. Coming after more than a decade of economic stringency, the additional pressure of the past year has called upon our courage and ingenuity to the very utmost. Nevertheless, it is gratifying to be able to report that very real progress has been made during the past year in the application of modern co-operative research to the important and immediate problem of developing improved types of street cars. Progress has also been made by the Committee on Fare Structures whose purpose is to analyze the problem of developing an equitable and fair system of local transportation rates which will provide not only necessary revenue, but which will tend to stimulate that class of riding needed to balance our load factor so that the transportation system may be made of maximum use to the community.

"If we stop for a moment to consider ourselves objectively, it may help us to realize that our efforts to solve our own problems take on a new significance. If we can do that, we can go back to our appointed tasks to take up the problems of the future, to encounter success and failure, difficulty and achievement, inspired by the realization that we have a vital part in a great enterprise, a great adventure—that of making our country and the world a better place in which to live."

MILWAUKEE COMPANY PRESENTED WITH COFFIN MEDAL

Following Mr. Shannahan's address, President Hanna read the report of the Committee on the Charles A. Coffin Foundation Award and presented to S. B. Way, president and general manager of the Milwaukee Electric Railway & Light Company, the Coffin Medal. William A. Daniels, representing the Employees' Association of the Company, was given the accompanying check for \$1,000. Abstracts of the briefs presented by the four competitors in the contest appear elsewhere in this issue.

The address of the evening was made by Julius H. Barnes, chairman of the board of the Chamber of Commerce of the United States. "Lack of national

and international confidence is the chief cause of the present difficult situation and its restoration is the chief need of the world," Mr. Barnes declared. "The evil effects which flow from lack of confidence are apparent. It creates caution and fear, and shrinks the normal expenditures of ordinary living which maintain manufacturers, merchants, distributors, transportation and factories. It results in reduced consumption, lowering of commodity prices, the sale at low prices of good securities and prevents the flow of capital from the centers where it tends to accumulate in idleness to the places and employments in which it is needed.

SOUND COURSES OUTLINED TO RESTORE EQUILIBRIUM

"The time has come when business men of the world must take determined action in defining sound courses under which a restored equilibrium of business may reflect into a restored welfare of whole peoples. This program," Mr. Barnes continued, "must include in its essentials these points:

"1. France and Germany must earnestly and sincerely seek an accord by which the world shall have a political moratorium. The time has come for nations to think less about borders and frontiers, and more about expanding interchange of goods and finance on which will rise the welfare of all peoples.

"2. Great Britain is assured of a friendly understanding and co-operation in these days of trial and perplexity. Balanced budgets and national economy will rebuild her financial positions.

"3. For all of Europe, an atmosphere of peace and confidence would greatly contribute to the welfare of their peoples. Business men hope the coming disarmament conference in Europe will point the way to lighter burdens laid on industry and on individuals in all these countries. More than that it should create a new spirit of international good will, thereby stimulating international finance and international trade.

"4. South America with its vast potentialities for trade and commerce will lay the foundations for a new confidence. But political instability repels timid capital. There must be a realization that self government assures a continuity of administrative responsibility under which capital may venture.

"5. Here in America we also have the problem of how to restore national confidence in such a way that our resources and energy shall expand the fabric of trade until it takes up the fringe of unemployment. These things are suggested to restore confidence and enterprise in America: (a) Join the World Court, and thereby show international co-operation and good will; (b) Pre-

pare to support a sound program of international finance to follow the short moratorium; (c) Press for effective results from the coming disarmament conference; (d) Stretch and spread employment to the utmost; (e) Revise the 40-year-old anti-trust laws which today destroy the small business; (f) Frame our tax requirements to spread justly and fairly where it can best be borne without injury; (g) Give regulated industry like the railroads a fair chance to maintain their earnings and credit; (h) Exercise economy in national expenditures; (i) Reassure the individual American that we shall preserve the traditions of private enterprise, and that governments shall be an empire only to preserve fair play between its people; (j) Continue to adjust the protective tariff; (k) Use the great reservoir of American sympathy and its genius for organization in caring for cases of individual misfortune, and (l) Avoid in any form, donations from the national treasury as charity dole.

"6. For all self-governing peoples of the world this period of distress should invoke a sober study and understanding of the relations of governments to the individual activities of their people. Clearly, after the occurrence of these last few months, people who aspire to self-government must demonstrate their fitness for such exercise of power. It is necessary that they clarify their conception of the province of government.

ECONOMIC FORCES BETTER UNDERSTOOD

"Today in America, there has never been such an understanding of the economic forces which have culminated in this depression, and with it never such quick human sympathy as desires to be helpful in alleviating the misfortune and distress that flows from this dislocation. This depression seems deeper because of the advanced standards to which we have attained. After all the real capital of people rests in their character and their ability. They can rebuild from misfortune. They can re-create and reconstruct. But they need for that a confidence resting on conviction that they have a free and fair opportunity. In that respect there is a solemn obligation on government that it shall preserve that fair field of opportunity. There is a solemn obligation as well on business leadership that it shall recognize that modern business is invested with welfare of all its workers and that it must labor unceasingly to advance that welfare. This I believe to be the conviction of the business world today.

"This spirit in business leadership and the evidence that self-governing people are possessed of understanding, self-control, fortitude and courage will re-create confidence—the first prerequisite to world recovery."

American Committees

Had Active Year

MANY noteworthy accomplishments are recorded in the reports of the committees of the American Association for the year just ended. Addresses covering the work of the Committees on Fare Structures and Street Traffic Economics were presented at the general session of the association on Thursday, and appear in abstract among the other addresses. Reports of the special committees on Revision of Constitution and Bylaws, and Employee Relations are presented below, as are the reports of the Standing Committees on Publicity and National Relations.

National Relations

The Interstate Commerce Commission, in a series of hearings, has had under consideration the problem of highway transportation, and the Washington office and its staff have been utilized by the attorneys of several member lines in the preparation and presentation of evidence in the aforesaid hearings. Six member companies utilized the Washington office and library for several days, and the general counsel and his staff assisted in the preparation of exhibits and evidence of ten witnesses who took two full days to put in their evidence in the aforesaid hearings.

Following the presentation of evidence by six member company lines, and on account of the importance of the general subject of highway transportation, the general counsel, at the direction of the Executive Committee, prepared and filed a brief and argument with the Interstate Commerce Commission on behalf of the American Electric Railway Association, setting out in considerable detail the position of the Association on this all-important subject. Copies of such brief and argument were printed and distributed to all member companies, State and national associations, public utility commissions, State officials, chambers of commerce, and parties in interest generally.

For several years the committee has been endeavoring to obtain a clarification of the Interstate Commerce Act so that electric railways reporting to the commission may know what their status is under the law. The position taken by the Government concerning interurban electric railways has raised such a fog of uncertainty in regard to the position of such railways under the Interstate Commerce Act that a final settlement of this troublesome problem must be had before any electric railway

that reports to the commission may be certain of its status.

Efforts have been made from time to time to interest Congress in the subject, but in the absence of agreement on the part of the Interstate Commerce Commission and the state public utilities commissions and the industry as a whole, no progress has been made in obtaining the necessary statutory enactments. Representatives of your committee have had several conferences, during the past year, with representatives of the Legislative Committee of the National Association of Railroad and Utilities Commissioners, and with representatives of the Interstate Commerce Commission, for the discussion of proposed legislation to remove the ambiguities in the Interstate Commerce Act. Such discussions and conferences, it is believed, have materially advanced the ultimate solution of the problem of clarifying the act. Until such legislation is passed or until the Supreme Court by a decision clarifies the subject, no electric railway reporting to the commission may be at all certain of its status under the excluding language of various provisions of the act.

At the request of certain member lines, the Washington office made a study and report on the subject of the Safety Appliance Acts and their application to electric railways reporting to the commission as found in the various decisions of the Federal courts. In connection with this subject it should be pointed out that the Safety Appliance Acts generally require electric railway equipment operating on electric railroads reporting to the commission to comply with all their provisions.

At the direction of the Executive Committee of the association, the Washington office canvassed electric railway mail-carrying lines (both member and non-member lines) in regard to the commencement of an action for the increase of electric railway rates of mail pay. In the last decision of the Interstate Commerce Commission fixing rates of mail pay for short-line steam railroads, the rates so fixed were considerably higher than comparative rates paid to interurban companies carrying mail. It was thought that possibly a case might be prepared to enhance the earnings of interurban companies from

mail pay, and a bulletin was put out to all electric railways reporting to the commission asking co-operation. After the receipt of a number of letters indicating a lack of interest, and a request on the part of the heaviest mail pay electric line member that the subject be dropped for the present, the matter was filed for future reference and will again be taken up at a more propitious time.

In this connection, the committee points out that an inequality exists in the rate of pay fixed for electric interurban lines as compared to short-line steam roads, and it is the thought of the committee that a persuasive case could be made before the commission to secure increased rates for interurban mail-carrying lines.

In the 71st Congress there were three sessions. The bill in which this industry was most interested as a constructive piece of legislation was the Motor Bus Bill. It passed the House early in the 71st Congress, but failed to pass the Senate. It will no doubt be a measure of major importance during the coming session of Congress which convenes in December. In passing, the committee calls attention to the fact that the December Congressional session is so evenly divided between the major parties that at the time this report is written no one can predict with accuracy which party will organize and have control of the committees in the House of Representatives. The natural result of this condition will be that constructive legislation will be difficult to pass. In other words, the power in Congress will be exercised without the restraining effects of party responsibility. The committee looks for a considerable number of bills proposing legislation adverse to the electric railway industry's interest, and on this account the committee renews its request, and desires to emphasize it this year, that all member lines respond promptly to calls for information and assistance in legislative matters.

Revision of the Constitution and Bylaws

After thorough discussion the committee agreed that it would be inadvisable to attempt to carry out the original plan of effecting a complete revision of the association's basic document this year. It was felt that the drafting of a complete revision should be deferred to give more time for further study to the many angles of the problem. A plan was discussed for anticipating the

proposed complete revision of the constitution and bylaws by changing the name of the association this year to accord with the broader field of interest of its member companies than is indicated by the present name. The committee decided, however, that the advantages to be gained from a change in name at this time do not outweigh the disadvantages that might ensue from premature action on this detail before the entire problem of constitution revision is worked out.

The committee recommended the substitution of the following paragraph in place of four existing paragraphs in Section IV (a) dealing with membership:

"One of the qualifications for company membership shall be that in the opinion of the Executive Committee, the applicant shall be conducting its business in conformity with the policies of this association. In considering applications for membership the Executive Committee should seek the advice of member companies in the territory in which the applicant conducts its business and shall give consideration to the standing of the applicant among such neighboring members."

The committee also considered two changes in the constitution recommended to it by the Nominating Committee. The first of these involves a reduction in the number of vice-presidents from four to three, and the second provides for the creation of an additional operating member at large on the Executive Committee to serve for a term of one year. The Nominating Committee suggested that a move should be made this year toward eliminating the practice which has grown up of nominating the vice-presidents in progression through four grades to the presidency. Adherence to this precedent has meant in effect that the man nominated for fourth vice-president has been named for the presidency of the association five years before the year in which he is expected to serve. For a number of years many officers and members of the Executive Committee have held that this custom is not good practice for the association to follow, and it has been urged that a change should be made in the constitution which would change this practice.

The second change recommended by the Nominating Committee, that an operating member at large be added to the Executive Committee to serve for a term of one year, was proposed in order that all interests concerned might be fully represented on the Executive Committee next year when the important subject of complete revision of the constitution will be under consideration again. The suggested change will also maintain the present number of operating company representatives on the Executive Committee, the new office of member at large for a one year term taking the place of the fourth vice-president.

After full consideration the committee voted unanimously to adopt the changes in the constitution recommended by the Nominating Committee.

Another item considered was a suggested addition to the bylaws growing out of a question of interpretation with respect to the method of calculating dues payable by operating member companies, the particular point involved being the meaning of the phrase "gross receipts derived from electric railway operation and other forms of transportation service" as used in Paragraph (b) of Section XIV. The interpretation placed upon the present Paragraph (b) of Section XIV by the Finance Committee was that gross receipts used for calculating dues should include all operating revenue accounts from Nos. 101 to 119, inclusive. The drafting sub-committee agreed with this interpretation of the present bylaws but felt that it was inadvisable, for the future, to include Income Account No. 118 (Power) in calculating dues. The following paragraph was thereupon adopted to be inserted between the present first and second paragraphs of Division (b) in Section XIV:

"Gross receipts as used herein shall be the sum of operating revenues from all forms of transportation engaged in by the company and its controlled subsidiaries, and shall include operating revenue accounts Nos. 101 to 119 inclusive, with the exception of Account No. 118 (power) as prescribed by the Interstate Commerce Commission Classification of Accounts for Electric Railways, or their equivalent for the other forms of transportation."

In conclusion, the committee recommended strongly that the work of complete revision of the constitution and change in the name of the association be continued, and that every effort be made to complete the entire reorganization of the association's structure during the next association year.

Publicity

At the beginning of the present association year, the Committee on Publicity adopted a program of eight major subjects with which it should deal during the year. Those subjects were: traffic congestion relief, economy and safety of public transportation, community value of co-ordinated public transportation, selling public transportation, accident prevention, intercity service, modernized franchises, and tax relief.

Traffic congestion relief has been featured above other subjects. The committee has tried particularly to draw the attention of newspapers, periodicals, civic bodies and public officials to the causes of traffic congestion and approved remedies for it. In all publicity material directed to these sources, the committee has endeavored to tie up the situation with the broader aspects of all urban life, in order that the problem

might not be dismissed as a minor thing which, if ignored, eventually would solve itself. The committee has received a cordial and intelligent response to its effort, especially from the daily newspapers.

Despite the fact that all accident prevention committees of the various associations have been disbanded, the publicity committee has continuously carried on a safety program. It regrets very much the dissolution of these accident prevention committees, because in previous years they have been the source of many valuable advertising and publicity suggestions. Inasmuch as accidents still are draining the industry of about 4 per cent of its gross receipts, the committee suggests consideration of the advisability of a study designed to co-ordinate the accident prevention work of the association and the National Safety Council, Street Safety Section.

Progress has been made in the study of direct selling of transportation, but this situation still is in an incipient state, and only a brief report can be made on it. The director of advertising has co-operated with one of the major companies in canvassing 6,000 families to get their reaction on service, and to lay a groundwork for intensive direct sales planning. The survey was made by 30 employees in their spare time, and results were very enlightening and satisfactory. This work continues.

The advertising section at present is engaged in putting into shape material forwarded from many parts of the country in connection with community value of co-ordinated transportation. Limited service has been rendered in connection with modernized franchise in intercity service and tax relief subjects. The reason for this is that there have been few developments on these three subjects within the association during the last year.

Because of unusual economic conditions, which varied greatly in different parts of the country, the committee endeavored this year to make its service to members more personal than ever before. The writing of local copy, it was felt, would be most beneficial. Primarily, an issue of the loose leaf advertising folder, containing some 2,500 samples of advertisements and posters, was prepared and distributed. Companies then were urged to write the association special requests. The response was encouraging, an average of ten a week being received throughout the year. This was approximately double the special requests for the previous year and also was the high mark for any special association service.

The committee believes that recent developments and improvements in portable talking movie machines make it advisable the feasibility of entering the

talking film field be carefully considered. A shortage of speakers always has existed within the industry, and as a result publicity has been restricted. The conviction has existed for a long time that the industry's story should be told more broadly by word of mouth. Particularly there should be a speaker at every State and sectional transportation meeting, and at as many large business gatherings of all kinds as possible to present the industry's problems from a national standpoint. This program has not been carried out because of lack of time, cost and other considerations. The committee believes that if a practical portable talkie projection machine can be obtained, and the proper films made to go with it, talking programs could be presented at many such meetings.

As to the major subjects to be followed during the coming year, the committee believes that the eight approved at the outset of 1931 still are the most important confronting the industry and it would again recommend that they be given major attention.

Employee Relations

It was decided to focus attention of the committee for this season largely on the following activities:

1. Promulgating the plan for training leaders for employee conferences of all kinds by sponsoring training courses wherever and whenever such courses are desired locally and are financially feasible.

2. Studying, with the aid of the research facilities of the association, what appeared to be topics of outstanding interest in the personnel field, including: (a) Bonuses and awards. (b) Retirement annuities (pensions), and group or other insurance schemes. (c) Employee training and follow-up.

3. Studying the whole field of employee relations with a view to recommending, for the guidance of future committees, the topics most likely to prove profitable for investigation.

4. Providing such participation in the annual convention program as would help to arouse interest in the recommendations of the committee. Included were plans for a luncheon conference to be sponsored by the chairman and for an exhibit of the personnel work of member companies. A leader-training course, to be held at the time and place of the convention, was considered but was deemed impracticable at this time.

Subcommittees were appointed to carry out assignments made in accordance with the above plans. At the later meetings of the committee the work of these subcommittees was reviewed and their recommendations acted upon. Their reports, which have had the consideration of the main committee, are presented as appendixes.

At the beginning of the season the committee had hoped to arrange for four or five regional training courses for conference leaders. On account of the adverse conditions in the industry it proved practicable to hold but two courses, one in Chicago and one in Boston. Both were successful, each in a slightly different way although the scope and plan of both courses were similar. In Chicago there was greater interest among electric railways and a slightly larger attendance. One result of the Boston course was the appointment of an inter-utility committee (electric railway, electricity and gas) to continue the interest through some kind of informal "get-togethers." A leaflet was prepared setting forth "The A.E.R.A. Plan for Training Leaders to Conduct Conferences."

A special subcommittee, after a careful study of this subject, came to the following conclusions: That industry should take steps to formulate its own plans for retirement of aged and disabled employees based upon uniform principles; that a portion of the problem of old-age maintenance should be placed upon the individual, or in other words, permanent retirement plans should be contributory and not entirely free; that such plans should be carefully calculated, trusted and made financially sound.

The same subcommittee reports the following conclusions under the above heading: That the recent depression,

with its consequent unemployment, has emphasized the real value placed upon group-insurance protection for the employee, and that group insurance acts as an acceptable tie-in between employer and employee; that group insurance programs should be built upon a contributory rather than a free basis; that programs covering health and accident are highly desirable, whether separate or tied in with group insurance.

Research by the subcommittee assigned to this topic disclosed enough actual and extended experience with bonuses and awards, especially in connection with accident reduction, to furnish a factual basis for intelligent analysis of their local applicability on any property. Many companies are securing substantial benefits from bonus plans. The subcommittee has performed a helpful task in indicating the trends in this field, without going into details of particular plans.

In view of a decision not to hold an Atlantic City training course this year, it was decided to arrange for visits by a representative of the committee to conveniently located properties with a view to arousing greater interest in the conference plan. Mr. Cox made the two-week tour in which he visited a number of properties in Virginia, Kentucky, Ohio, and Maryland and in each city gave such assistance along personnel lines as was desired locally and was feasible in the limited time available.

Old and New Executive Committees Hold Convention Meetings

A FINAL meeting of the outgoing Executive Committee was held at Atlantic City on Sunday evening, September 27, just prior to the opening of the 50th Annual Convention. Brief reports were received from the various convention committees indicating that all preparations had been completed for the opening on the following day. Chairmen of several of the standing and special committees outlined briefly the reports which their committees had to submit. At the conclusion of the meeting, D. W. Harvey, general manager Toronto Transportation Commission, invited the American Electric Railway Association to hold its next annual convention at Toronto in conjunction with the convention of the Canadian Electric Railway Association.

On Thursday afternoon, the first meeting of the new Executive Committee was held with the new president, G. A. Richardson, in the chair. F. W. Doolittle, chairman Finance Committee, spoke at some length on the financial affairs of the association, and outlined a program for the coming year which

met with the unanimous approval of the committee. President Richardson announced the appointment of a committee to co-operate with the managing director in the preparation of a brief to be presented to the United States Chamber of Commerce in connection with its study of the urban transportation problems. Appointment of a number of committee chairmen for the coming year was also announced as follows:

Finance—F. W. Doolittle.

Subjects and Meetings—Walter A. Draper.

Publicity—Barron Collier.

Advisory Equipment Financing—Thomas Conway, Jr.

Revision of Constitution and By-Laws—F. W. Doolittle.

Co-operation with State and Sectional Associations—F. R. Coates.

Employee Relations—A. B. Paterson.

Fare Structures—Edward Dana.

Insurance—H. B. Potter.

Manufacturers' Advisory—Safford K. Colby.

Street Traffic Economics—E. J. McIlraith.

Taxation—E. W. Wakelee.

Policy—J. H. Hanna.

Coffin Award Won by

MILWAUKEE

T.M.E.R.&L. brief tells how riding and revenue were increased and service improved. Notable records of accomplishments were also presented by electric railways in Baltimore, Des Moines and San Francisco

ACHIEVEMENTS of an unusually high order of merit were recorded by each of the four contestants in the ninth annual contest for the Charles A. Coffin Award made to "that electric railway company within the United States and Canada which during the year has made a distinguished contribution to the development of electric railway transportation for the convenience of the public and the benefit of the industry." As in previous years, six principal factors were considered in making the award. These are: (1) more riders and more revenue; (2) a friendly public; (3) lower costs and increased reliability of service; (4) increased safety for riders, employees and the public; (5) co-operation between management and employees; (6) financial accomplishments. Presentations were made by the following

companies: Des Moines Railway, Market Street Railway of San Francisco, the Milwaukee Electric Railway & Light Company, and the United Railways & Electric Company of Baltimore. These presentations show the successful efforts of all of the competing companies in improving the service rendered by them to the public, their progress in merchandising rail transportation, the exercise of great ingenuity in planning and carrying out programs of improvement against the influence of many opposing forces. All of the contestants have reason to be proud of their accomplishments, and it was only after prolonged consideration that the committee selected the Milwaukee Electric Railway & Light Company to receive the 1931 prize.



ture on May 4, 1930, was accelerated by the demand of the city of Milwaukee that a single fare schedule should be applicable to any area annexed. The Railroad Commission did not recognize the city's argument as valid, but it did make the fares apply within a radius of about 5.5 miles, instead of 3.7 miles, regardless of political subdivisions. The plan adopted made extensive use of the weekly pass as told in an article published in the September issue of the JOURNAL. In the first year after the change, revenue was fully maintained in the face of the hard times, and riding increased 8.65 per cent, whereas car-hours decreased 6.9 per cent. Peak loads were reduced because of economic conditions, but the total traffic increased because of the short-haul, off-peak riding induced by the pass.

The combination of 10 cents cash (formerly 7 cents) and the pass reduced the time of fare transactions by 60 per cent thereby raising the net operating speed in twelve months from 9.22 to 9.73 m.p.h., while the ratio of one-man operation rose from 82.2 per cent to 89.5 per cent. A further departure from traditional practice was the removal of all direction, route and intersection restrictions from transfers. This resulted in a pass type of transfer which is good up to 1½ hours after the original time of tendering fare. The effect of this hourly pass was to increase cash fares in the face of the seasonal downward trend. Apparently, this is due to the creation of short-haul round-trip riders.

Facilities of the Milwaukee company have been increased steadily year by year. The modernization of the several interurbans extending out of the city has involved the largest single outlay

Riders and Revenue Increased at Milwaukee



The Milwaukee company furnishes coordinated railway and bus service to nearly 1,000,000 people

"CONTINUITY in progress" is the phrase selected by the Milwaukee company to describe the achievements recorded in its presentation. The brief points out that when an undertaking has been under the same direction for more than a generation, sensational changes from one year to the next are unlikely. The achievements recorded are the fruition of policies long and persistently pursued. Nevertheless, the company was able to meet the letter of the contest specifications through the work done in the immediate past.

Improving service to attract patronage and adjusting rates to popularize the use of this service were outstanding achievements of the Milwaukee company. "More riders and more revenue" were accomplished literally despite the devastating effect of widespread unemployment.

The introduction of a new fare struc-

of capital. The company was faced by the alternative of allowing these interurbans gradually to go to seed, or bringing them up to a standard that would quicken Milwaukee's growth to the status of a great metropolis. A similarly progressive policy has been adopted for the expansion of freight business, including co-operation with motor-truck concerns for store-door delivery.

That the company foresaw the possibilities of motor bus operation, and knew how to protect itself against competition, despite the absence of regulation, is apparent from the fact that its interurban bus operation goes back to 1919, its city feeder bus operation to 1920, and its city de luxe operation to 1923. Almost all of such operation was new mileage. Rail lines have been extended and modernized—not sacrificed. In 1930, interurban bus vehicle-miles were 23 times greater than in 1921, advancing from 100,032 to 2,320,175. Round-trip route-miles at the same time increased from 59 to 1,938.6.

This company pioneered in the United States with the use of powdered fuel and high-pressure steam. Its efficient power practices are reflected in the low cost of energy delivered to the railway department. In substation work



Establishment of improved rapid transit service to outlying towns has been an outstanding accomplishment of T.M.E.R.&L. Company

specialized machinery. The passage of time has demonstrated that these practices are sound and economical.

Much could be said of safety practices and policies, but the measure of efficiency probably will always remain the percentage of gross earnings demanded for the injuries and damages account. In this respect, the Milwaukee company reports that this ratio fell to 2.76 per cent in the first year of the new fare structure. Among special achievements of the safety work are: Reduction of treadle accidents through various improvements; development of a clinic for accident-prone trainmen, which has raised all but a hopeless few to records better than the average; successful use of the spirit of emulation in attaining and retaining high percentage of men completely free of chargeable accidents for periods of one, two and three years; interest-arousing methods of discussing accidents by means of a portable traffic laboratory, and by showing that greater safety with greater speed raises the bonus.

Since 1911, the company has dealt with its employees through an Employees' Mutual Benefit Association whose activities probably are the most varied in America. Through a plan whereby employees pay 75 cents a month dues and the company pays 1.25 per cent of operating revenue, it is possible to give the members a great variety of benefits in health work, pensions, insurance, social activities, and education for every helpful purpose. The attainment of twenty years of unbroken industrial peace is offered as an argument for the success of this plan.

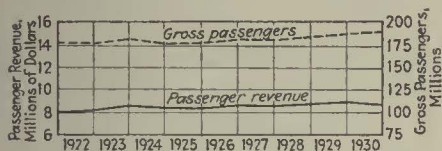
In 1921, Milwaukee inaugurated applied psychology in the selection of trainmen. Since the first work along these lines, it has improved its methods to the point where nearly all the men who show superiority in the tests prove equally superior in practice. So satisfactory have been the results, that psychological selection has been extended to such non-manual employment as carhouse clerks, in addition to power, substation line and shop jobs.

One branch of the Employees' Mutual Benefit Association is an educational department, which, in the course of eleven years, has grown to the extent of offering about 100 different courses. Many of these courses are of direct value to different types of transportation employees. All E.M.B.A. lessons are free, regardless of the student's performance. If outside courses are taken, the expense is defrayed by the E.M.B.A. upon evidence of satisfactory completion by the student.

When the original merit and demerit system was widely tried by electric railways nearly a generation ago, the Milwaukee company accepted it on the basis that the permanent success of such a scheme depended upon assuring the employee continued financial benefit from better work. The fear motive was regarded as of no permanent value. Time has justified this policy. Instead of dropping the grading system for platform men, Milwaukee has revised and expanded such grading since 1914. Furthermore, the principle of mutual gain-sharing has been extended to an increasing variety of jobs in all the engineering divisions and even to certain kinds of clerical work. In general, the men receive 40 or 50 per cent of the savings due to more efficient methods. Since the company carries the administrative expenses of the bonus system, the employees really get the lion's share.

There are two outstanding financial achievements of the company. First, the fixed charges have been consistently reduced. In 1920 the funded debt was 52 per cent. Furthermore, in 1930 the total capitalization was about \$9,000,000 less than "total property and plant," thereby bringing the funded debt ratio down to 48 per cent.

An achievement of the current year has been the redemption of 6½ per cent notes which are not due until 1933, and the calling of 7 per cent War-time preferred stock. This saves \$100,000 per annum in fixed charges at a time when such savings count most. Moreover, the remaining securities are enhanced in value.



Both the number of passengers carried and the passenger revenue of T.M.E.R.&L. Company have been increased in recent years

this company was also among the first users of the mercury arc rectifier. The brief outlines changes in substation practice, including the introduction of automatics. The modernization of the interurbans was accompanied by improved voltage, obtained chiefly through increasing the number of substations. Trolley and span wire breaks are continually decreasing. Composition trolley wire is saving about one-third of the renewal cost. Particularly interesting is the graphiting of trolley wire which has helped greatly to make possible the 100 per cent use of trolley shoes.

The statistics presented show that with equipment of rising average age, pull-ins have been reduced and maintenance cost cut steadily from year to year. Special attention has been directed to betterments in air brakes and treadle-door mechanisms, whereby the braking distances have been shortened and door accidents reduced.

Outstanding achievements of the way and structures department were the introduction of chrome nickel special work and higher standards of concrete track construction, with liberal use of

Second, the record of the company in the sale of preferred stock to customers may be summarized by stating that professional salesmen have been engaged in this work since its formal organization in 1918; that the company has paid dividends on its preferred

stock without a break for 30 years; and that the price of its 6 per cent preferred in recent years has fluctuated less than United States 4½ per cent Liberty Bonds.

Stability Achieved at Baltimore

TODAY residents of Baltimore can say of their street railway service not only that it is up-to-date, that its fare is reasonable, and that it is financially a stable and dependable industry, but they can say, in a sense never possible before, that it gives them "rapid transit." Behind this lies a record of accomplishment ably presented in the company's brief for the Coffin Award. A policy of street railway management and operation, shorn of display and directed to the achievement of stability, produced in 1930, for the United Railways & Electric Company of Baltimore, a depth of public confidence, a soundness of financial rating, and, for the past year of depression, a relative constancy of patronage and revenue sufficient to demonstrate the inherent vitality of a carefully guided transportation utility.

First there confronted this company the need of a rate of fare commensurate with modern costs and service demands. The years following the World War had witnessed a succession of "street car fare cases" before the Maryland Public Service Commission, each one approached by the company with the hat-in-hand manner, almost apologetically, each one fought by the People's Counsel, each increase granted grudgingly. None of these rates began to produce a rate of return approaching the 7½ to 8 per cent returns earned by other utilities and sanctioned by public regulation and the courts. In the face of this situation, this company began, on Aug. 1, 1927, its fight for legal sanction of the principle that a rate of return of 7½ to 8 per cent should also be approved for electric railway utilities.

It began also at the same time a fight for a proper and adequate depreciation reserve. For many years public regulation had decreed that the amount to be laid aside annually by this property for depreciation should be 5 per cent of its gross revenue. As a part of its case for a fare that would produce a just return on the value of its property, the company contended for a method of computing depreciation that would put a stop to the direct annual losses in equity, accruing to the owners of the property because of the lack of balance between actual depreciation and the depreciation reserve.

The fight was carried finally to the United States Supreme Court, which, on Jan. 6, 1930, rendered an opinion that depreciation allowance is properly

figured on present value, and that any attempt to enforce rates yielding less than 7½ per cent (in this case 7.44 per cent) was as confiscatory for an electric railway utility as for any other utility. As a result of this decision, a straight 10-cent fare went into effect on Feb. 6, 1930.

Then began the second stage of the company's program — service improvement. Throughout the summer of 1929, the staff of the company had worked on plans and specifications for new rolling stock, and early in the fall, a definite statement of a conservative program of service improvement was publicly made. This program involved the purchase of 50 modern street cars. More than three months before the Supreme Court's decision was handed down, bids on the construction of these cars were asked for. At least two weeks before the decision arrived, contracts had been awarded. So encouraging were the company's operating results after the new fare became effective that the board of directors promptly authorized an expansion of the improvement plans to call for the purchase of 150 new cars instead of 50, and to include a three-year program for rebuilding and speeding up 300 cars then in service. It was possible to announce



The information bureau of the United Railways & Electric Company of Baltimore answers 100,000 questions a year



Speedy service with attractive new cars has won popular favor in Baltimore

this publicly within two months after the new fare had gone into effect.

The third step in the company's program was to solve the problem of rehabilitating electric railway credit. Faith in the soundness of this company's position even before the United States Supreme Court's decision and the launching of its service improvement program, was based upon the apparent stability of its earning power as shown in the statements of its gross earnings over the past six-year period. In this time the company's earnings have scarcely varied more than \$500,000. But after the decision in "the Baltimore Case," faith in the company's stability and belief in the soundness of its credit increased to a notable extent.

A readiness to listen to public appeals for reasonable expansions and extensions of service helped in 1930 to continue and to enhance a favorable state of public understanding and co-operation with the company. In spite of the fact that 1930 was not generally viewed as a favorable year for undertaking expansions and extensions, this company, during that year, added four new bus lines: double-tracked a single-track car line in the suburbs for a distance of three-quarters of a mile; built new track, loops and curves at sixteen different points on the system for more efficient operation of the new cars, and carried on for the entire year the operation of a 25-cent de luxe coach line introduced in Baltimore in the fall of 1929. This line proved unprofitable, and was given up at the end of the year.

With all these advances in the promotion and improvement of the company's service, operating expenses in 1930

were \$300,083.78 less than those of 1929. In addition to this, fixed charges were reduced \$102,200 through the retirement of the portions of funded debt to which reference has been made.

Despite higher operating speeds, heavier street traffic, etc., the company had a decrease of 5.2 per cent in total accidents in 1930 compared with 1929. No distinction is made in the figures between "Chargeable" and "Non-Chargeable" accidents. Since 1919 street railway accidents of every sort in Baltimore have been reduced 38 per cent.

None of these accomplishments would have been possible without the most unselfish, thoroughgoing and enthusiastic employee co-operation. During 1930 a series of "Public Information Conferences" was inaugurated with employees who were members of neighborhood and community associations in Baltimore. Through this system there was present at each neighborhood improvement association meeting during the year a United Railways' man, a

frank publicity about its affairs, the distribution of information about the company's business and its service, making it easy to use the cars and buses conveniently by inviting queries of all sorts; contacts with all public officials whose work affects the company's business; performing free advertising services for civic bodies

engaged in civic or neighborhood promotional or charitable affairs; the swift and satisfactory adjustment of service complaints, and promoting the use of the service not only by these means, but by advertising designed to increase public realization of the superior economy and convenience of street car riding.

Substantial Economies Effected at Des Moines

THE Des Moines Railway claims to have demonstrated that street cars can be operated efficiently at very low cost in medium-sized American cities, and that they must, therefore, be continued in these cities as the principal mode of public transportation. Of all its accomplishments in 1930, that of greatest interest to the entire electric railway industry is this claim to efficient operation at low cost.

All cars in Des Moines were operated by two men during the first half of 1930. Complete changeover to one-man operation of cars was effected in the six weeks from July 4 to Aug. 18. Consequently, the full economy of one-man operation was not realized during 1930. Nevertheless, the operating ratio for the year was 62.26.

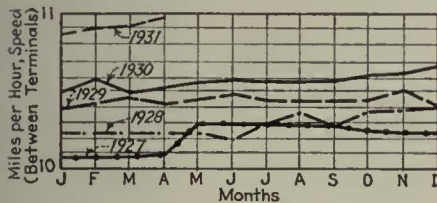
This healthy condition of the Des Moines Railway today stands out in striking contrast to that prevailing before the advent of the present management on July 16, 1929. In early 1929 a labor dispute which had seethed for years was as yet unsettled. Fifty archaic trolley cars with wooden seats were operated daily. Two men were kept at work on every street car. The old company was hampered by public and political ill will, and hopelessly mired in receivership.

For years the progress of the company had been spotted with strikes, fare difficulties and occasional suspensions of service. During 1921, a model service-at-cost franchise had been

granted by the city. At the same time, a new union contract had been signed which provided for the employment of two men on every car until 1940. This contract closed the door to the main escape from increasing expenses. The company asked that a new contract be signed with the union and that the operation of one-man cars be permitted. The union refused to change the contract, and was upheld in its stand by the State Supreme Court. Revenues continued to drop. The introduction of \$1.25 weekly pass in 1926 helped to remedy the decline, but did not completely cure it. The company passed into the hands of the receivers, and finally was sold to the present owners.

Among the difficulties which confronted the new management were the following:

1. An operating expense of 27 cents per car-mile, without depreciation.
2. A tax burden that had increased by leaps and bounds until it consumed 10 per cent of the total gross revenue of the company.
3. A strongly organized disgruntled group of trainmen, who had been concerned in the past in numerous strikes.
4. Intense opposition to one-man cars. Efforts had been made for years to break the contract that prohibited the operation of one-man cars until 1940. The new management had not purchased this contract with the balance of the property at the receiver's sale, and therefore was confronted with the necessity of either entering into a new union contract providing for one-man operation, or of refusing to



Average speed of street cars has been substantially increased in Baltimore

respected resident of the neighborhood, fully equipped to answer all questions about street railway problems of that community or of the city generally, or authorized to see that the questions were fully and frankly answered by some qualified person in the company's organization.

A suggestion box system, calculated to make of the company's 5,000 employees a "Better Service Army" constantly on the alert for chances to improve service and produce economies, made a remarkable record in 1930. A regular and permanent system of group conferences for groups of supervisory employees, reached, in 1930, a point of perfection greater than it had previously attained. But perhaps this company's outstanding accomplishment affecting the relationship between its men and its management lies in the changeover from two-man to one-man operation when the new cars went into service, involving a total reduction in platform personnel of 32.8 per cent. It was accomplished with the utmost smoothness and lack of friction by the simple expedient of making most of the new installations during periods of the year when additional men would normally have had to be hired.

In general, this company's method of merchandising its service involved



The Des Moines Railway has demonstrated that street cars can be efficiently operated and at low cost in medium-sized American cities

deal with the union as an organization.

5. A deplorable state of public relations. Newspapers were extremely unfriendly. The property for ten years had been the campaign issue of politicians. Public ill will had been fostered in a large measure by the struggle between the trainmen and the company.

6. Thirty per cent of all street cars were obsolete and unfit for operation under modern conditions.

7. One hundred and one fairly modern cars not equipped for one-man operation.

In addition to these immediate problems, it was necessary to develop ways and means of turning a decreasing and insufficient net revenue into a figure that would warrant the continuation of the property as a railway undertaking.

Accomplishments recorded during 1930 include the following:

1. Operating costs without depreciation were reduced from 27 to 17.62 cents per car-mile. This was accomplished by the elimination of dead wood in all departments, and through consolidation and elimination of departments.

2. Through efforts of the company, a new law was passed by the State Legislature which places tax jurisdiction of public utilities under the State tax commission instead of the three city, State and county bodies. It is believed that taxes will be greatly reduced under the new method of assessment.

3. During the year 1930, a previously hostile group of trainmen has become a decidedly friendly one. Despite everything that had gone before, the trainmen instructed their officials to appear before the City Council to withdraw their previous objections to the operation of cars by one man, and have since manifested a spirit of friendly co-operation toward the company.

4. One-man operation was accepted and approved by the trainmen, the city authorities and the riding public.

5. An era of friendship and trust between car riders, civic bodies and the company has replaced the old antagonism. Newspapers have ceased their attacks upon the company, and every paper, without exception, is now friendly to its interests.

6. New labor agreements were negotiated which permits the operation of the cars by one man.

7. Improvement in net income from a state of anticipated default to complete solvency. It is the belief of the present management that a surplus will result with

the return of business to normal condition.

8. Thirty per cent of all equipment was obsolete eighteen months ago. One hundred and sixty-three street cars were maintained. In eighteen months, 63 cars have been scrapped, and 50 new cars of modern design have been placed in service. Ten were purchased in late 1929. Forty more

were bought in 1930. One hundred and forty-five cars are now maintained to render 30 per cent more service.

9. In order to institute complete one-man operation, it was necessary to remodel 101 cars. This was accomplished in 100 days. Within six months, 145 one-man cars were in service.

New Franchise a Notable Achievement at San Francisco

SETTLEMENT of an extremely complicated franchise situation, in the face of what were generally conceded to be almost hopelessly adverse conditions, was the outstanding accomplishment reported by the Market Street Railway, San Francisco. The problem was originally tackled by the new management five years ago. A militantly hostile press was leading well-organized political ownership forces which had already established one of the strong city-owned street railways of the country. This same savage opposition had the public behind it sufficiently strong to have just previously defeated, by a vote of 9 to 1, an effort to turn over the privately owned lines to the city at a fair price, and was in full cry to "take the property as junk" on "a streak of rust" basis. So strongly were the city legislative officers bound by their avowed policies to "drive the private company of the city," that they could not participate in a move to settle the tangle fairly without laying themselves open to the charge of having "sold out." And they openly boasted that victory for them lay along the course of exterminating private capital from the street railway business in San Francisco.

The new management embarked upon a policy of winning its rights directly from the public, despite the hostile press, and aimed at a form of operating grant to take the place of expired and expiring franchises which would place the matter out of reach of politics. Recognizing that in the past the industry has found political settlements expensive and unstable at best, the com-

pany succeeded with the people where it could not make progress with the press and legislative officials. The company's operating permit is now a part of the city charter by vote of the people. The charter, of course, is the mandatory law governing the city's lawmakers. The charter amendment also relieves the company from certain destructive provisions which are still in the charter, but, by virtue of the new operating permit, do not apply to the company's property. While the city's right to purchase for purposes of municipal ownership and operation remain unimpaired, the new operating permit protects the company by providing that such purchase shall be at "fair value."

To achieve these ends, the fundamentals of good service—public frankness and an open-door policy to public and employees alike—constantly progressing improvements in service and equipment, were relied upon. The ideas developed on the property, and advanced practices, worked out elsewhere in the industry, were applied impartially to attain success.

The property has been well maintained and many improvements made wholly out of earnings. Speed has been materially increased and power costs cut despite some of the heaviest grades in the country and increased traffic signals. Accidents were reduced 27.7 per cent in 1930. The company's bonded debt was cut from \$12,329,000 in 1925 to \$8,857,500, a reduction of \$3,471,500. Without any demands from the men, wages were increased \$225,000 per annum.



The illuminated white fronts of the Market Street Railway cars have both merchandising and accident prevention value

Luncheon Conferences Cover

Many Important Subjects

LUNCHEON conferences, held at noon on three days during the week, were organized in four groups of three each: (1) meeting problems during the depression, (2) co-ordination, (3) service improvement and fare experiments, and (4) traffic regulation and planning.

Large and Small City Activities

Results of outstanding policies and methods adopted during the present business depression by large-city companies, by small-city companies and by interurban lines were the subjects of three luncheon conferences. The first, sponsored by J. H. Alexander, president Cleveland Railway, dealt with the problems of the large city class. Dean J. Locke, director of research United Railways & Electric Company, Baltimore, opened the discussion by showing the effect of 150 new cars on earnings, costs and speed. He stated that the new equipment has created new revenues of about \$2,000 per car per year, has reduced operating expenses and platform labor costs alone by about \$2,500 per car per year, and made possible the speeding-up of service on ten lines from 4 to 14 per cent.

C. H. Evenson, superintendent of transportation Chicago Surface Lines, told of the modified working conditions accepted recently by the platform men in Chicago, showing how this saving will amount to approximately \$600,000 per year. Mr. Alexander discussed wages and told of reductions of rate during the 1921 depression, and suggested staggered work to provide time for extra men. S. W. Greenland, vice-president and general manager St. Louis Public Service Company, pointed out the danger of forcing men to lay off one day in eight or some such similiar arrangement if a change in wage agreement is to come up in the near future. He said that it would be used as a reduction in wages, and any proposed reduction would be considered an additional cut.

K. B. Thornton, general manager Montreal Tramways, discussed economies made on his property by telling how savings had been put up to each department supervisor. The result far exceeded any major move that the management could have made at the time. Results of fare change and experimental fares in Milwaukee were

given by S. B. Way, president Milwaukee Electric Railway & Light Co.

Modernization and merchandising were strongly recommended as proper steps to effect economies on the small-city property. The luncheon on this subject was sponsored by F. L. Butler, vice-president Georgia Power Company, C. W. Gifford, general manager Des Moines Railway, discussed the economy program in Des Moines which has been carried on since 1928, and told of the reorganization of departments and department employees, and of how a permanent reduction of 10 per cent in operating expenses was made. J. H. Pritchard, manager Lynchburg Traction & Light Company, told what was being done in Lynchburg, Va. to effect economies. He showed that twenty new one-man cars purchased in 1928 had permitted an increased speed of 16 per cent, and had effected a saving of about \$42,000 a year in operating expenses—enough to pay from 12 to 16 per cent return on the purchase price of the cars.

George R. Green, vice-president and general manager Northern Indiana Railway, discussed the wage reduction on his property which was made upon the request of the employees without solicitation by the management. He pointed out that his company, over a period of years, had been developing with the men a feeling of mutual confidence. The policy of letting the men know the facts resulted in the men voting 100 per cent to accept a reduction in wages as a stabilizing factor for the company and their jobs. H. H. Dartt, president and general manager Scranton Railway, urged small companies to merchandise their service. He explained his company's program of improving equipment and then advertising the better service. J. P. W. Brown, vice-president Tennessee Electric Power Company, Nashville, Tenn., outlined his company's program of economy under four heads—improved maintenance, resulting in a reduction in cost from 2.6 to 1.9 cents per mile; reduction in accidents due to a vigorous safety campaign; advertising, and efforts with other business interests in the city to maintain employment.

Co-ordination of buses with rail service and the operation of store-door freight service was discussed by Frank Karr, vice-president and general counsel Pacific Electric Railway. P. T. Reilly, manager, Delaware Electric Power

Company, told that economies were effected in Wilmington when 32 new cars were put into service, 46 old ones modernized, standardization of buses completed, one-man operation put into effect, and 15 miles of unproductive track abandoned. P. V. C. See, vice-president and general manager Akron Transportation Company, discussed reorganization and abandonment of some of his company's lines which resulted in a saving of \$5,000 per month. One garage and one car house were closed due to this change and efficiency in operation and maintenance was put directly up to department heads. F. G. Buffe, vice-president in charge of operations, gave details and figures on the new profit-sharing plan in force at Kansas City. An abstract of his talk appears elsewhere in this article.

Interurban Problems

The third luncheon, devoted to the solution of the interurban problems, was held under the sponsorship of C. H. Jones, general manager Chicago South Shore & South Bend Railroad. C. Thorburn, purchasing agent Pacific Electric Railway, described in detail the structure and operation of his company's motor freight business. He dealt particularly with rates necessary to meet competition and the advantages of using local draymen in various towns served by the freight lines. Daniel Durie, vice-president and general manager West Penn Railways, Pittsburgh, Pa., told of the service betterments made on the West Penn Lines, and the use of employees for merchandising the service and stimulating more riding. L. L. Huntoon, public relations manager Chicago, Aurora & Elgin Railroad, told of his company's employee solicitation survey, and the formation of a "Tours Bureau" to educate people in the territory to ride to Chicago.

Edward A. Keenan, passenger traffic manager Cincinnati & Lake Erie Railroad, told of a market analysis made for his company by the use of a questionnaire. These questions were answered by passengers on the de luxe trains and resulted in the management making numerous changes in operating methods. Among these changes were extended stop-over privileges for salesmen, free parking at terminals and ride stimulating fares. Dr. Thomas J. Conway, president Cincinnati & Lake Erie

Railroad discussed interurban car design. He emphasized the necessity for speed on interurban lines, and said that high-speed cars should be designed as a result of wind tunnel tests. Using power to fight the wind is throwing money away, according to Dr. Conway.

Traffic Regulation and Planning

Three of the luncheon conferences were devoted to discussion of traffic regulation and planning. The first of these, held on Tuesday under the sponsorship of E. J. McIlraith, considered signals, signs and regulations. The subject was introduced by Burton W. Marsh, city traffic engineer, Philadelphia, Pa., who spoke of recent developments in signals, particularly those actuated by the movement of the vehicle, both automotive and rail. The evils of over-signaling, particularly in the nation's capital, were brought out by E. D. Merrill, president and general manager Washington Rapid Transit Company. Advantages resulting from the use of electromechanical signals under various conditions were outlined by Alonzo R. Williams, vice-president and general manager United Electric Railways of Providence, R. I.

Under the sponsorship of Walter A. Draper, a luncheon conference held on Tuesday considered the subject of planning new traffic facilities. Maj. J. P. Hallihan, chief engineer Detroit Rapid Transit Commission, spoke of the danger to pedestrians and users of electric railways resulting from the present trend toward increasing street widths. He referred to the possibility of requiring not only one lane, but all vehicular traffic between the street car and the curb to stop whenever the street car stopped. Another solution of the problem which he suggested was the relocation of tracks to place them nearer the curb, thus creating a roadway in the center of the street for through vehicular traffic. E. P. Goodrich, consulting engineer, New York, expressed the opinion that double-deck streets are an architectural fantasy and an economic fallacy. Experience shows, he said, that the benefits resulting from the construction of such streets are not sufficient to justify the cost. Advantages of by-pass routes were discussed by Lewis W. McIntyre, traffic engineer, Pittsburgh, Pa. Other speakers at this luncheon were William S. Canning, engineering director Keystone Automobile Club, Philadelphia, Pa., and Major Carey H. Brown, engineer director Rochester Civic Improvement Association.

Parking and garaging were the subjects of a third luncheon conference at which T. Fitzgerald, vice-president Pittsburgh Railways, acted as sponsor. Experience with no-parking regulations in Kansas City was outlined by Dan Fennell, general superintendent of transportation Kansas City Public Serv-

ice Company. He pointed out that the experiment had been tried during a period of depression, and had, therefore, been blamed by the merchants for a loss of business which more probably was attributable to general conditions. A prepared discussion by D. W. Pontius, president Pacific Electric Railway, was read by A. V. Thompson, manager transportation department General Electric Company, San Francisco. Mr. Pontius told of the gradual tightening of parking restrictions in Los Angeles, and predicted that eventually no parking would be permitted in the downtown business district. How the parking situation in Washington, D. C., has been improved lately was explained by C. Melvin Sharpe, assistant to the president Washington Railway & Electric Company. H. D. James, Westinghouse Electric & Manufacturing Company, described an automatic parking garage recently developed. His talk was illustrated by a small working model.

The Trolley Bus

That interest in the trolley bus is increasing was evidenced by the attendance of almost one hundred delegates and the intensive discussions at this luncheon, sponsored by A. B. Paterson, president New Orleans Public Service, Inc.

In presenting C. H. Evenson's paper, "What the Trolley Bus Has Meant to Chicago," W. C. Becker, Chicago Surface Lines, related the steps leading to the initial installation in Chicago, and told of the results of the vehicle in the various types of service for which it was adopted.

W. B. Brady, Central Public Service Corporation, read a paper by A. P. Lewis, Rockford Electric Company, on trolley bus operation in a city of less than 100,000 population. Although prevailing conditions made the installation an expensive one, it is estimated, on the basis of present results, that savings will bring a 20 per cent return on the excess investment over gasoline buses, without including any increase in revenue.

"Finding the Proper Place for the Trolley Bus in New Orleans" was the subject of a paper by I. O. Mall. The speaker stated that two separate studies have been made in his city for the purpose of determining the field of application of the vehicle, particularly as compared with street cars. The first deals with the vehicle itself—its principal characteristics, limitations and cost of operation, and the second with the trolley bus in relation to existing transportation facilities.

Stops at curbs, accidents, icy weather operation, life of tires, maneuverability, acceleration rates, depreciation, franchise taxes, headways, comparative costs, and sizes of the vehicle were other topics discussed extensively at the meeting.

Co-ordinating Rail and Bus Services

No longer is the bus regarded as a competitor of other local transportation agencies—it is regarded as an important ally which can be used for many classes of service, and co-ordinated with the existing vehicles in use. This thought was expressed emphatically by the speakers at the bus luncheon, presided over by Adrian Hughes, Jr., superintendent of bus transportation, United Railway & Electric Company, Baltimore, Md.

Tracing the several steps leading to the adoption of the bus by electric railways, Carl W. Stocks, editor of *Bus Transportation*, stated that mass transportation operators now consider the bus as a unit to make more money. Mr. Stocks referred to the improvements made in recent years in vehicles, and stressed the importance of sound merchandising, thorough maintenance and proper operation.

E. S. Pardoe, Capital Traction Company, told of the experience with deluxe city bus lines in Washington, D. C., and discussed the accompanying problem of selecting routes, adjusting fares, selection of the most economical equipment and meeting competition from unregulated taxicabs.

The history of co-ordinating the street cars and buses of the Public Service Co-ordinated Transport, over the past eight years, was related by A. T. Warner. Stating that co-ordination means the economically proper use of each vehicle, the elimination of duplication of service and the welding of the two services in one complete whole, Mr. Warner told of the many uses made of buses in adjusting and supplementing services.

In concluding, Chairman Hughes expressed his views on the extent to which the several types of transportation units could be co-ordinated and spoke of the results in this regard in Baltimore.

The Taxicab

Although it was generally agreed that the taxicab was a desirable unit to co-ordinate with existing types of mass transportation vehicles, it was considered of first importance that electric railways co-operate with the legitimate cab companies to eliminate the cut-rate cab, and bring about legislation which would place the cab in the common carrier class, before it be adopted. This thought proved the keynote of the taxicab luncheon, sponsored by F. G. Buffe, vice-president Kansas City Public Service Company.

Naming the steady reduction in rates and the flooding of the field by car manufacturers with vehicles for cut-rate operators as the two biggest plagues of the industry, H. A. Innes Brown, editor of the *Taxi Weekly*, pointed out that

with the lower rates few companies were able to operate at a profit, and that with the number of cut-rate cabs ever increasing, the competition with both street cars and legitimate cabs was becoming nothing short of a menace. He stated that the cab should be classed as a common carrier and regulated strictly as a public utility.

Expanding on the seriousness of cut-rate competition, W. W. Cloud, president of the National Association of Taxicab Owners, stated that these cabs were educating the public down to price and not up to standard. He urged that organized mass transportation systems and legitimate cab companies unite and struggle for fair, sane, regulatory measures, that would insure stability of operation, give confidence, enable the rendering of safe, responsible service and secure an adequate financial return.

Rankin Johnson, Trenton Transit Company, related the experience of his company in the operation of taxicabs and told of the efforts to assimilate the vehicle as a part of a co-ordinated local transportation system.

Paul H. Geysler, Terminal Cab Corporation of New York, stated that the manufacturers desired legislative measures to stabilize the industry, and declared that co-operation of organized transportation companies and legitimate cab owners would benefit all concerned.

Relating the experience of his company in co-ordinating the taxicab with other vehicles, Chairman Buffe said that every effort was made to direct business to the cabs. Co-ordination, he stated, was brought about principally through regulating the operation of the cabs, combining maintenance and accounting departments, and advertising.

Fare Structures

Particularly provocative in thought was the discussion at the luncheon on fares on Thursday which was attended by more than 50 operators. Chairman Doolittle so conducted the meeting as to induce discussion, and many questions were asked intended to dispose of points about which there might be misunderstanding on differences of opinion.

Among those who participated were Messrs. Mall, New Orleans; Holden, San Antonio; Chase, Gary; Glazer, Cleveland; Boardman, Boston; Williams, Providence; Moody, Milwaukee; and Burlingham, Pittsburgh. The topics ranged from the efforts made at New Orleans to distinguish between the load factor and the use factor, through the San Antonio zone trial, the 5-cent zone experiment in Gary, the zoning experiment in Cleveland, the community fares on the Eastern Massachusetts Street Railway, the use of the pass in Providence, the selling of transportation in Milwaukee, and the interurban zone system on the West Penn, with 175 miles of route serving 25 major communities,

the largest of which is 55,000. On this system there are 80 fixed fare zones, varying in length, but averaging 2.06 miles in length.

A statement by Mr. Boardman that his company had made 311 fare reductions illustrated well the lengths to which the operators are prepared to go to sell the service. A particularly pertinent statement was his comment that sales of passes on that system varied from 4 per 1,000 of inhabitants in Lawrence to 23 per 1,000 in Fall River. The trend of opinion was that the disposition was to give the rider the breaks.

Scheduling Operation and Supervision

Lively discussion featured the lunch on scheduling. Joe R. Ong, Cincinnati, the sponsor, introduced A. J. Fink, St. Louis, who stated that the work done on his property in the last two years has resulted in an increase in speed from 8.71 to 9.62 m.p.h., measured in platform time. Time points have been eliminated, and the men have been given instructions as to how to get over the road most quickly. Unnecessary stops have been cut out. As a result, accidents have been reduced 29 per cent. One-man lines constitute about 17 per cent of the total, but give 25 per cent of the car-miles. R. A. Pierson, Los Angeles, told of similar methods being used in his city. The speed has been increased 10 per cent in two years, while the accidents have gone down 26 per cent. C. H. Evenson, Chicago, told of the need to have a real analyst to make the schedules. He believes that cars should be run on time to the fullest extent possible, and that there will be a riding response to this.

J. Metcalf, Toronto, told the results with headway recorders which were installed extensively on his property. The recorders are placed in division headquarters while there is one in the head office of the lines of the downtown districts. A total of 70 contactors were installed at a cost of \$20,000. The company also has 136 private telephone boxes from which the car operators can call to a central dispatcher. This system eliminates delays and prevents disputes. W. W. Holden, San Antonio, spoke briefly of the telephone dispatching system. He believes that in small cities where long headways are necessary, it is preferable to schedule cars on even spacing, such as 10, 15 or 20 minutes. Small cards are published giving the schedules of the long headway lines, and similar information is published on the bulletin boards. Trainmen are rated on their schedule performance which has gone up from 70 per cent of the cars on time to more than 90 per cent.

Dean J. Locke, Baltimore, said that the effect of slack schedules on the patrons is bad. On his property, the correct running time is determined by

many stop-watch observations made by riders on the cars. This record is broken down into the time for stops, delays and run. After the correct running time has been determined in this way, a car is placed on "midnight test." It is run over the route by a specially trained motorman to simulate daytime conditions. The schedules are then made out with this running time as a basis. By this method the slack time has been reduced to a minimum.

J. W. Welsh, New York, mentioned the importance of uniformity of operation by individual motormen to conform to the schedule. It is necessary to train the men intensively to do this. In obtaining such a result it is necessary to watch carefully the former history of inspectors and supervisors, according to J. L. Smith, Montreal. A man who has risen to his position from that of motorman is not likely to be careful in checking running time as is one who has been a conductor. Several other speakers agreed on this point. Alonzo R. Williams, Providence, believes that schedule making is an art, but that it is worth all of the cost.

Training the Platform Man

Ralph W. Emerson, Cleveland, introduced F. G. Buffe, Kansas City, who discussed in considerable detail the plan for compensating the trainmen adopted by the Kansas City Public Service Company. Briefly, the men get 25 per cent of the net income whether the stockholders of the road obtain any return or not. Up to the present time this payment has been made in bonds of the company so that at their market price the men obtain a return considerably greater than current interest. In the first six months \$83,000 was distributed among the employees. He said that the net result has been a decrease in accidents, in equipment failures and in delays to service, and that the net return to the stockholders has been increased materially even after deducting the amount paid the men.

Adrian Hughes, Jr., Baltimore, told of the excellent results obtained by having the local school boards give intelligence tests for rating the men. This, he said, not only simplified the work of the company but put the responsibility for the selection of the men on a civic body. A number of speakers pointed out the values of conference training and schools of various sorts for the employees. The question of payment for time spent in school was discussed at some length. It was the opinion of those present that careful use of the time paid for but not worked would make it possible to put the men in school on the company's time with little if any additional cost.

Another problem which has given considerable trouble is the training of older men. Conference training has apparently given the best results.

Brady Awards Won by

BOSTON ELEVATED and CALGARY MUNICIPAL

AFTER carefully considering and analyzing the records submitted by 118 electric railway companies entering the competition for the Anthony N. Brady Safety Award, the committee selected the Boston Elevated Railway to receive the medal in the large-city class, with honorable mention to the Department of Street Railways, Detroit. The Calgary Municipal Railway was selected to receive the medal in the small-city class, with honorable mention to the Youngstown Municipal Railway. No award was made in the interurban class.

Before proceeding to the task of determining the winners of this year, the committee had a careful study made by the statistical department of the A.E.R.A. of the whole basis of classification. This investigation confirmed the opinion, expressed in last year's report, that the scheme of classification heretofore in use was not well adapted to bringing into competition companies whose operations were fairly comparable in character. As a result an entirely new system of classification has been adopted, as well as a new method of rating the records of the companies within each class.

VEHICLE-MILE BASIS UNSATISFACTORY FOR COMPARING ALL SYSTEMS

The most obvious weakness of the old classification, which was based solely upon the number of vehicle-miles operated, was that it made no distinction between city and interurban operation. Only a moment's reflection is necessary to realize that there can be no common basis on which to compare a city system operating on congested streets with an interurban line operating wholly or partly on a private right-of-way. The committee, therefore, had no hesitation in deciding that for the purpose of awarding the medals, the companies should be divided into two main classes, city and interurban, with separate prizes to be competed for in each class.

Another less obvious but almost equally potent source of difficulty was revealed by the researches of the association's statistical department. In making these studies attention was concentrated principally upon the number of collisions, both because they are the most serious kind of accident and because they are the type of accident

that is most definitely within the control of the operators. It was known, of course, that the number of collisions tended to increase with the size of the company, but the interesting fact brought out by statistical analysis was that in city operations not only the number of collisions, but the frequency of them, increased with the population of the city served. Thus, when the companies were arranged in order according to the populations of the cities served, the number of collisions per 100,000 car-miles operated increased with the population, and when the two factors were plotted against each other, the result was a smooth curve rising quite rapidly as the population increased up to 300,000 and then rising much more slowly as the population increased beyond that point.

CITY ENTRIES JUDGED IN TWO POPULATION CLASSES

This suggested first, that, in rating the city companies, their accident records should not be compared directly with one another but in relation to their performance within their class; and second, that because of the change in the slope of the curve at 300,000 population, the group of city companies should be broken down into two classes—those serving cities of less than 300,000 population and those serving cities of more than 300,000 population.

The committee, therefore, decided to adopt this method in rating the companies. Of course, other factors such as the number of fatalities, number of personal injuries, number of boarding and alighting accidents, etc., were also taken into consideration as heretofore, but the greatest weight was attached to the records made by the contestants with respect to collisions.

The decision to make no award in the interurban class was due to the fact that the data received from this group were not sufficiently detailed to permit an equitable decision. This is due to the peculiar conditions under which they operate, which make it necessary, in order to compare them, to secure data in a great deal more detail than most of them are able to furnish from their ordinary records. Some interurbans operate entirely on private rights-of-way; others operate entirely on public streets and highways; and still others operate partly on private

rights-of-way and partly on public streets, the proportions varying among different companies. Some interurbans operate in and through large cities, while others operate only through relatively small towns and villages. Obviously, in order to compare such companies it is necessary to know the amount of service on private right-of-way and the amount on public streets and highways. It is also necessary to know the number and populations of the cities and towns through which a road operates, and the proportion of its service given in each town. All of these data were requested from the companies, but none was able to give complete information. The largest and most representative interurban companies did not even attempt to give it. It was, therefore, impossible to determine what company was entitled to the award.

FURTHER INTERURBAN STUDY NEEDED

Without these data, it is impossible to compare the companies. Even with such data in hand, the committee doubts whether the results arrived at would be entirely equitable. It recommends strongly that before another prize contest is inaugurated an intensive study of the whole question be made, preferably with the assistance of experienced interurban operators.

Canadian Meeting Well Attended

CANADIANS present at the convention held an informal meeting on Wednesday morning, Sept. 30. K. B. Thornton, Montreal, president of the Canadian Electric Railway Association, presided. A number of matters were discussed in a general way. On behalf of the Toronto Transportation Commission, D. W. Harvey, general manager, stated that an invitation had been given to the American Electric Railway Association to hold its convention next year in Toronto. There was some discussion as to the time and place for the Canadian Electric Railway Association's annual meeting next year, Mr. Harvey also extending an invitation to that body to meet in Toronto either at the same time as the American Association or at the regular time for the Canadian meeting. Attention was called to the work of the headquarters staff of the Canadian Association, which has met with good response from the membership. A number of compilations have been prepared, and are available for the covering features of railway operation on Canadian roads.

Following the general meeting there was a meeting of the Executive Committee of the Canadian Electric Railway Association. Mostly routine business was transacted.

RESEARCH *Is Theme of*

Engineering Sessions

PRESIDENT L. D. BALE, in his address to the Engineering Association, sounded the keynote of "Research" as expressing the work of the association during the year, and as being an absolute necessity in the solution of many of the major problems of the industry. As proof, he mentioned: first, the conduct of a thorough investigation of electric railway cars in order that progressive improvements may be made; second, scientific research involving the field of economics found in the work on fare structures by the American Association, and third, the work of the Committee on Economics of Rolling Stock Application. This last committee is making an extensive study to determine the relative advantages of the several types of rolling stock—rail car, trolley bus and motor bus—under any given set of conditions, so that the industry will be supplied with knowledge leading to a definite decision relative to the desirability or feasibility of making extensions to existing lines or substituting one form of vehicle for another, or of the abandonment in part or in whole of an existing route.

"In this highly competitive age," continued Mr. Bale, "the individual can no longer be guided largely by his own views and opinions. More than ever we need to act collectively, to base our judgment and our decisions on the results of scientific analysis of all the available facts. Here is where this association can be of maximum service. It has the machinery, and is in an excellent position to conduct scientific research."

Frank R. Phillips, in a paper read in his absence by Thomas Fitzgerald, stressed the importance of the engineer in all projects for modernization of transportation service, particularly with competitive conditions of today, and the need of developing executives from the ranks of the engineers. A lively discussion followed, and several speakers pointed out methods for improvement and economies.

Reporting for the Committee on Economics of Rolling Stock Application, James W. Welsh, New York, pointed out that it is not possible to determine the place of the several vehicles available by means of a mathematical formula. So-called constants fluctuate with



L. D. Bale
President

the amount of service given, and political and financial ramifications also must be taken into account. In the discussion, H. C. Patton brought up some of the problems involved in determining revenues and expenses of individual routes.

L. C. Winship presented the report of the Committee on Heavy Electric Traction. In the discussion, H. F. Brown, New Haven, pointed out that the steam railroads are facing the same problem as the electric railways in shrinkage of passenger revenues due to highway competition. Perhaps highways should be taxed so as to make them self-supporting, he said, rather than to charge the cost to the taxpayers, including the railway systems. Electrification is today cheaper than at any time in a generation, according to Mr. Brown, due to low labor and material costs. If the railways can be sure of the business, they will proceed with many installations.

Martin Schreiber related the experience of the Public Service Co-ordinated Transport with a Diesel-electric bus. He was hopeful that the development of this type of drive will be of great value in transportation work. Discussing this paper, Col. G. A. Green pointed out some of the problems connected with the Diesel engine, and believed that a great deal of work will have to be done

before all the fundamental problems are solved.

Award of the ELECTRIC RAILWAY JOURNAL maintenance prize to the Georgia Power Company, Atlanta division, was made by W. W. Wysor, chairman of the committee of judges. This year the award was based on data showing the general character, quality and cost of the maintenance work done by the various companies in the industry during the year. Honorable mention was given to the Department of Street Railways, Detroit; Memphis Street Railway; New Orleans Public Service, Inc., and Virginia Electric & Power Company.

Mr. Wysor presented the report of the Committee on Nominations, the following ticket then being elected for the ensuing year:

President—Charles H. Jones, general manager Chicago, South Shore & South Bend Railroad, Michigan City, Ind.

First Vice-President—P. V. C. See, vice-president and general manager Akron Transportation Company, Akron, Ohio.

Second Vice-President—E. M. T. Ryder, way engineer Third Avenue Railway System, New York, N. Y.

Third Vice-President—Howard H. George, superintendent of way Cleveland Railway, Cleveland, Ohio.

Executive Committee—Officers and L. D. Bale, junior past-president, A. T. Clark, W. E. Bryan, J. Fleming and C. A. Smith.

Following the election, the new officers were installed and the past-president's badge was presented to Mr. Bale by the incoming executive, Mr. Jones.

Separate sessions of the four divisions of the Engineering Association, power, purchases and stores, rolling stock, and way and structures were held on Tuesday and Wednesday afternoons. Each was presided over by the chairman of the division, who outlined the results of committee work during the year, and received the reports of the various groups. A brief résumé of the sessions follows:

Power Division

Sessions of the Power Division were held on Tuesday and Wednesday with Dwight L. Smith, chairman of the Standing Committee on Power, presid-

ing. Reports of the several committees were received.

Considerable discussion developed on the subject of mercury power rectifiers, following the presentation of a paper by H. W. Coddling, Newark, N. J., giving the present status of the device for railway service. D. C. West, Westinghouse Electric & Manufacturing Company, held that it will be necessary to develop a rectifier which can supersede the rotary converter for all purposes. He believes that greater reliability and higher efficiency will be reached within the near future. On the subject of interruptions, Mr. Coddling stated that the more recent rectifiers have bettered performance records. All rectifiers that are being made will carry overloads according to the standard guarantee for conversion equipment.

Another subject of interest was trolley bus overhead construction. A. J. Klatter, Chicago, showed lantern slides and movies illustrating the method of erecting the overhead line in Chicago for the recent trolley bus installation. In the discussion, L. W. Birch, Ohio Brass Company, pointed out that tests show the negative trolley shoe wears three times as fast as the positive shoe. The reverse is true of trolley wires, the positive wire wearing twice as fast as the negative. In response to a question, Mr. Klatter stated that with shoes it has been possible to reduce the trolley pole pressure to about 22-24 lb. per shoe.

Results of the collection of information on trolley wire wear were given by H. S. Murphy, Philadelphia. Information which his committee has been gathering for a number of years was presented in a detailed report.

Effects of street railway equipment and service characteristics on energy consumption was the subject of a paper by T. F. Perkinson and R. H. Sjoberg, of the General Electric Company, read by Mr. Perkinson. Influence of a number of variables was pointed out. Increasing the rate of acceleration requires a larger power peak, but the energy consumption for a given run decreases slightly. Raising the free-running speed by changing gear ratios requires a greater current and also more energy. Reducing the time of coasting calls for more energy with a very slight gain in schedule speed. Increasing the rate of braking results in a faster schedule with some increase in energy. Reducing the time of stop gives an appreciable increase in schedule speed with no effect on the energy. Reducing the number of stops increases the schedule speed materially with lower energy consumption. Reduction in car weight is reflected directly in lower power demand and energy. The authors held that no practicable general analysis of the problem is universally applicable and each particular

change in equipment must be considered by itself. A number of delegates discussed the paper, bringing out the effect of the service variables. Morris Buck, New York, pointed out that the changes discussed could be placed in two groups; one representing possibilities with no modification of equipment, while the other required either new equipment or physical changes that could be made only at considerable expense. In the former class, the advantages can be obtained only by the co-operation of the transportation department through teaching the operators to run their cars more economically.



Trophy Awarded to Georgia Power Company in Journal Maintenance Contest

Spacing of substations for 600-volt d.c. railways was the subject of a paper by E. A. Imhoff, Chicago, read by J. F. Neild. A number of charts showed the effects of the various elements. They indicated that a combination of high substation cost with low feeder cost will dictate the greatest spacing of substations, while a combination of low substation cost with high feeder cost will give least spacing.

Purchases and Stores Division

Standardization of methods was the chief topic of discussion at the two sessions of the Purchases and Stores Division on Tuesday and Wednesday afternoons with C. A. Harris, Philadelphia Company, presiding as chairman. After a brief presentation of the standing committee report by the chairman the reports of the several committees were read and discussed.

A paper on standard packaging for electric railways by A. E. Hatton, superintendent of materials West Penn Railways, was read by J. Fleming, purchasing agent Capital Traction Company. Edwin W. Ely, of the Bureau of Standards, gave a formal discussion of Mr. Hatton's paper which evoked many comments from those present.

"Handling Bus Materials From the User's and the Vendor's Viewpoint" was then presented by W. E. Scott, superintendent of supplies Philadelphia Rapid Transit Company. Mr. Harris led a lengthy discussion on this topic.

Rolling Stock Division

Following the reading of the standing committee report by chairman Thomas H. Nicholl, superintendent buildings and equipment Cleveland Railway, the first session of the Rolling Stock Division featured two papers: "Brake Lining Development and Brake Tests," by F. C. Stanley, chief engineer Raybestos division of Raybestos-Manhattan, Inc., and "Experience in Trolley Bus Operation," by W. C. Wheeler, engineer of equipment Chicago Surface Lines. Mr. Stanley's paper pointed out the fundamental principles controlling the design of braking mechanisms and the selection of brake lining material. Maximum speed of vehicle, rate of retardation and frequency of brake applications were enumerated as the important factors in the temperature rise of brake drums. Mr. Stanley also described various forms of brake tests used by his company. Mr. Wheeler's paper, abstracted elsewhere, evoked questions from J. H. Walsh, superintendent of bus maintenance Middlesex & Boston Street Railway, and from P. V. C. Sec, general manager Akron Transportation Company.

"Aluminum—Its Uses and Past Experience in Car Construction" was the subject of a paper by A. H. Woollen, engineer Aluminum Company of America, at the second session. Several cars that have been built with aluminum alloys were illustrated. In designing a car of aluminum alloys, said Mr. Woollen, the first consideration should be that of deflection. In general, if the deflection of the car frame members is kept within satisfactory amounts, the stresses in the various parts will rarely exceed 5,000 lb. per sq.in., although 12,000 lb. per sq.in. under impact and 15,000 lb. per sq.in. under static loading is entirely safe.

The designer can keep down costs by employing shapes, sheet, castings, forgings and other standard aluminum products to the fullest extent and by watching the radii of bends. The extrusion process for producing aluminum offers a means of avoiding much shop cost in the making of joints and bends in such parts as belt rails, window sills, side posts and anti-climbers. Where necessary, however, hot bending or forming of the aluminum alloys can be done.

Welding of aluminum by the oxy-acetylene or oxy-hydrogen method and electric arc welding by metallic or carbon arc electrode are practical. However, aluminum welds are castings and there is an appreciable decrease in strength. The welding of side posts to

belt rails also should be avoided, he said. The remainder of this session was devoted to the presentation of eleven committee reports. Each of these reports was discussed at some length.

Way and Structures Division

Cost of track construction was the principal theme of discussion at the Tuesday afternoon session of the Way and Structures Division. A paper describing certain work done in Washington was read by E. P. Goucher, engineer of way and structures Capital Traction Company. Howard H. George, superintendent of way Cleveland Railway, in a prepared discussion of Mr. Goucher's paper, gave interesting data on the cost of track construction on his property. He placed special emphasis on the importance of vibration of the track structure as a means of insuring a good bond with the concrete.

The adoption of a few standard de-

signs of track was recommended by John B. Tinnon, sales manager Metal & Thermit Corporation, in a paper presented at the Wednesday session. He expressed the opinion also that the average way engineer is not sufficiently familiar with the designs and methods used on properties other than his own. The problem of economical track construction is not the problem of the management, the holding company or the banker, he said, but it is the problem of the way engineer. In conclusion, he urged that way engineers interest themselves more keenly in the problems connected with selling electric railway transportation to the public.

The report of the Standing Committee on Way and Structures was presented by C. A. Smith, chairman, at the Tuesday session. Reports of various committees were presented in summarized form. Abstracts of these reports appear elsewhere.



E. P. Goucher

tion for the new track. Due to a slight raise in the grade of the new track, we were able to leave in some of this material under the new ties and directly below the wheel rails. As there was an existing 6-in. porous tile subsoil drain between the tracks, no other drainage was installed on the new work.

The new track was carried on old scoria brick and small wedges, and held to line by means of blocks and wedges between the rails and the roadway and dummy concrete. As far as possible, the concrete was poured from the trucks directly into the track space. It was tamped under the ties with an International tamping machine, followed by an experimental vibrating machine sent us by the tie manufacturer. This machine consisted of two air-operated tie tampers mounted on a piece of 7 in. channel iron. Although crude, in some respects it was superior to the newer models, its main drawback being the noise. The only finishing necessary after the passage of the vibrating machine—and this is where grooved girder rail proves its worth—was the dragging of a short length of ¾-in. hose over the concrete.

We think that the method we are now using is as satisfactory, from an economical and practical standpoint, as is possible at the present time for rigid track in paved streets. We are not entirely satisfied, however, that the noise cannot be considerably reduced. There is no question but that all solidly concreted tracks are too noisy. Noise is one evil on which we are going to have to spend considerable thought and energy if we expect to continue street car operation. Probably a bituminous surface would be beneficial, although slightly increasing the cost, and we expect to experiment along that line on our next reconstruction job.

Construction costs on this track compared favorably with our past experience with surface track laid with 100-lb. T-rail on treated ties, and concrete to the top of the rails. In the table are given the unit prices paid for labor and concrete materials, and the labor-hours expended on the work, stated as dollars per lineal foot.

A Typical Urban Track Construction

By

E. P. GOUCHER

Engineer of Way and Structures
Capital Traction Company
Washington, D. C.

OUR present standard type of surface track construction consists of A.E.R.E.A. 7-in., 103-lb. girder grooved rail, with Thermit weld joints, installed on International bent steel twin ties, on 6-ft. centers, with solid concrete pavement to the top of the rails. The twin ties which we use are so formed or bent as to provide an arched effect from rail to rail, and at the same time reduce the amount of excavation and concrete necessary for the construction by about 295 cu.yd. per mile of single track. They are punched for the standard type forged-steel clip and tee-head

bolt as furnished by the tie manufacturer. We use truck mixed concrete of a 1-2-3½ mix, furnished by a local contractor. The trucks are of 3-cu.yd. capacity, and the water is added and the material mixed for five minutes after arrival at the job, under the supervision of the concrete foreman.

The old track was jacked out of the street, and necessary excavation and grading were done with pneumatic tools. Full sized wood templates of the finished excavation enabled us to trim very closely to line. The old ballast was very compact, and made an excellent founda-

Labor and Material Costs per Foot of Track

	Costs			Total	Labor Hours
	Labor	Hauling	Material		
Engineering.....	\$0.177	.....	.....	\$0.177	0.101
Excavating and removing old track.....	0.636	.....	.....	0.636	1.400
Disposal—excavated material*.....	0.158	0.133	.....	0.291	0.377
Installing steel ties.....	0.086	0.008	1.299	1.393	0.182
Installing wheel rail.....	0.072	.....	1.607	1.739	0.138
Thermit welding joints.....	0.113	0.001	0.194	0.308	0.210
Surfacing and lining.....	0.211	0.002	.....	0.213	0.424
Concreting†.....	0.420	0.004	2.667	3.091	0.982
Watchmen and lampmen.....	0.337	.....	.....	0.337	1.279
Sundry labor and material, including tools, etc.‡.....	0.145	0.062	0.218	0.425	0.315
Portable crossovers, including signals and switchmen.....	0.357	0.008	.....	0.365	0.850
Gross total.....	\$2.712	\$0.218	\$6.045	\$8.975	6.258
Scrap credit, including bandling.....	0.011	0.014	(0.655)	(0.630)	0.027
Net total cost.....	\$2.723	\$0.232	\$5.390	\$8.345	6.285

*Average haul about 1½ miles.

†Including burlap, labor sprinkling, etc.

‡No tool or equipment rental charged.

Experience in Trolley Bus Operation

By

W. C. WHEELER

Engineer of Equipment
Chicago Surface Lines

OUR early experience in trolley bus operation led to a number of suggestions for mechanical and electrical improvements in each subsequent lot purchased. The original buses were equipped with swiveling trolley wheels. The weight of the harp and wheel was approximately 12.25 lb., and with the 18-ft. pole it did not function satisfactorily. Due to the inertia of the dead weight, excessive tension was required to hold the wheels in contact with the wire, and it was found also that when one pole would come off it would whip enough to dewire the other. Springs were added to increase pole tension, but they had no effect on the tendency of the pole to whip when dewired. The inertia of the weight at the end of the pole was also detrimental in that under high wind pressure or rates of acceleration the pole would be pulled away from wire contact. Mine type wheels and harps tried were lighter in weight than the original ones, but did not help sufficiently to offset higher maintenance charges. With the development, however, of the swivel type shoe, conditions have been materially improved. The new assembly weighs approximately 5.25 lb., only slightly more than 40 per cent of the original. This has made possible a reduction of the shoe pressure on the wire, removal of the extra springs that were installed, and practically eliminated any tendency to whip or cause dewirement of the other pole.

Another source of annoyance was brakes, coupled with a decided steering wheel vibration on certain buses at the time of brake application. This was corrected by the substitution of a plain type of thrust bearing in the bottom part of the steering knuckle in place of the roller bearing that was furnished as original equipment. The brakes on trolley buses have the handicap of poor ventilation and the possibility of oil leakage from wheel and transmission bearings. As summer temperatures are encountered, together with conduction of heat from the brakes of the wheels, the grease becomes so thin in severe service that oil seals must be kept in practically perfect condition if the buses are to maintain braking ability. Another factor in brake troubles is the wide variation in brake pedal travel and pressure. Our efforts to standardize or make uniform the application of the brakes lead us to believe that a total travel of 5 in. with an effective travel



W. C. Wheeler

of approximately 4 in., all of the lost motion being at the "off" position to insure release, and pressures between 18 lb. minimum and 40 lb. maximum, will be the most desirable. A short pedal travel does not permit of quick and accurate determination of braking pressures. If the spring pressure is too weak, it will create a tendency for the operator to fan the air on rough pavement, due to insufficient support of the foot; while a pressure that is too high will tire an operator in all-day service.

The brakeshoes are now giving a satisfactory life after an early period of trouble with chatter, screech and rapid wear. Properly fitting shoes and ventilated rims and wheels are necessary in severe service if shoe life is maintained.

Proper selection of tire sizes has an important bearing not only on the tire life but on other factors, such as step heights and brake drum ventilation. Load distribution on wheels affects the braking effort available at each wheel. The heat from braking in severe service requires adequate ventilation of the drums and wheels, as overheated brake drums will cause rapid wear on brake-shoes, and also affect the oil seals and their effectiveness. Better results have been obtained where tire sizes are such that these conditions can be met, and the tire loads are kept within the tire manufacturers' rating of capacity. Brake testing equipment has reduced trouble.

In making provision for trolley bus maintenance we have followed standard electric railway practices, and the men have been carefully selected from regular carhouse maintenance forces. Motors, control, heaters, and a great amount of the air brake equipment are comparable with railway parts and the maintenance of this equipment is carried on along the same lines. The differences in braking and gear equipment are quickly learned, and the care of tires and steering mechanism are the only new parts to be maintained. We believe that this careful selection of street car maintenance men for servicing trolley buses has been a valuable aid in securing our high standard of maintenance and operation.

Bus Materials

Present New Problems to Storekeeper

By

W. E. SCOTT

Superintendent of Supplies
Philadelphia Rapid Transit Company

WHETHER in steam, electric car or bus operation, the old ABC of the stores department still exists—serve the operator, keep the line running, but don't forget the investment. Regular demands must be protected and emergency parts stocked. Minimums do not put gaskets on the engine. Certainly a control feature must be established, but I would hesitate to express an opinion for one method over another. The A.E.R.E.A. manual con-

tains an adopted plan of stock control which many operators indorse. Its scope includes:

1. Subdivision of material into classes, each containing material of a similar nature.
2. Actual review of each item by physical count at least once each month.
3. Actual review of consignments contracted for.
4. Summary of stock on hand and material on order and the preparation of

requisitions for purchase of future requirements at least once each month.

5. Compiling of statistics by classes from the dollar and cents view to determine the efficiency of operation.

Physical handling of bus materials is generally divided into four groups, as follows, each of which has its peculiar problems:

(1) Gas and oil. (2) Tires. (3) Units. (4) Repair parts.

In Group No. 1 the railway storekeeper forsakes his former problems of solid storage, such as rail, ties, wheels, etc., and enters a field of liquid storage and transfer. Each operator attacks his problems in a manner best suited to conditions. Some operators have found it economical to erect a large bulk storage plant with a capacity to handle steamer tank loads. Other operators locate their bulk storage at garage points adjacent to railroad sidings, or procure gas from contractors in bulk lots.

Oil is usually contracted for delivery as required to garages and service stations. Some stores organizations maintain oil reclamation plants where the used product is thoroughly cleansed and brought back to its original state.

For many railways, tires are not a problem for the storekeeper, inasmuch as tires are being mounted by the contractor and used on a mileage basis; the problem of storage being theirs together with the mounting. But for those operators who are faced with storage of their own rubber, it is essential that all precautions are taken to insure against aged rubber, and that the stock of rubber is intelligently measured by the turnover.

Storage facilities for the ease of handling the units in Group No. 3 should be provided. Special skid platforms for ease of movement throughout the shop to storage house have been prepared for this material. These platforms are also provided with special arrangements for lifting chains to avoid damage to the unit.

In Group No. 4, standard storeroom arrangements such as bins, cases, racks, etc., should be provided. Wood and steel cases are in general use. However the daylight steel cases are found to be more generally used and certainly afford a saving in space, better light, lower costs, tend towards better house-keeping and permit a more accurate count of stock. Above all else, the proper identification of material stored must be made.

The vendor has his problems which, in a general way are ours all over again. He provides a system of control based on sales. He cannot afford to tie up a lot of dollars in inactive material, and his turnover must also be consistent with his investment. I now give you the vendors, views from two sources. One vendor states: "My

company does not believe that material problems are yours; we think that they rightfully belong to us. Your material requirements should be handled by one of our service departments and go from our shelves to your buses. Our outfit is large and there are maintained throughout the states close to 100 service stations where we are always ready to serve your parts requirements."

The other vendor stated that his com-

pany maintained five service parts depots placed at strategic points in the country and serviced with parts by the general depot located at the factory. Each of these depots maintained a 24-hour service for customers' use. His recommendations with regard to material was that supply departments of the bus operators maintain their own storerooms and that material be ordered through these five general depots.

Diesel Engines in Transportation

By

MARTIN SCHREIBER

General Manager in Charge of Plant
Public Service Co-ordinated Transport
Newark, N. J.



Martin Schreiber

EUROPE up to this time has been the leader in Diesel engine work, because of a large differential between the cost of gasoline and fuel oil. The Diesel engine was invented and developed in Germany. Up to date, there are substantially 3,500 Diesel buses and trucks actually in operation in Austria, England, France, Germany and Switzerland. Capitol District Traction Company, Albany, N. Y., has operated a Mack bus equipped with a 6-cylinder Mercedes-Benz Diesel engine and General Electric propulsion units for a period of eight months. This bus has run about 24,000 miles. The fuel mileage is 5.22 miles per gallon as compared to a gasoline-electric unit that has a fuel mileage of 2.78 miles per gallon.

The Diesel engine experience of Public Service Co-ordinated Transport, Newark, N. J., covers approximately two years. One bus is in regular operation. It fits in with a schedule with gasoline buses on one of its city lines. This bus is a Yellow Coach Z-240, equipped with a Mercedes-Benz Diesel 6-cylinder engine with electric drive. The fuel consumption is about 5.50 miles per gallon, as against 3 miles for the

gas-electric buses. This superior fuel economy of the Diesel engine, together with the fact that the entire ignition system is eliminated, makes it particularly attractive to fleet operators. The engine and accessories are actually simpler than the gasoline assembly.

Mercedes-Benz Diesel engines, with which Public Service Co-ordinated Transport has experimented, are of the indirect injection or pre-combustion chamber type. The fuel pump and injection nozzles are standard Robert Bosch products. The engine is started readily, even if cold, and the bus can be driven almost immediately—no long warming-up period is necessary. Road performance is equal to that of gasoline buses of the same power, and the exhaust is practically colorless and odorless. These engines have been operated by numerous drivers and maintained by several garages, demonstrating that extraordinary care or skill in operation or maintenance is not required.

An important advantage of the use of Diesel engines is the elimination of the fire hazard in motor coaches, as well as in the storage, handling and transportation of the fuel. Another advantage is the elimination of the ignition system and carburetor, which would materially reduce the number of service interruptions. Failure of the fuel supply due to vapor lock, which is experienced in some gasoline vehicles during hot weather, would, of course, be eliminated by the use of fuel oil. Experience demonstrates cooling water and exhaust temperatures are noticeably lower than in gasoline engines.

Operating experience appears to justify an intensive development that should soon produce satisfactory engines. A considerable attitude on the part of fleet operators and their substantial encouragement, amounting to a demand, will greatly hasten domestic Diesel development.

Engineering Committees Show Results of RESEARCH WORK

Heavy Electric Traction

Six subjects were handled during the year by the Committee on Heavy Electric Traction. On the review of the existing Manual sections, it was recommended that the sections on clearance between contact conductors and permanent way structure be withdrawn pending joint action with the American Railway Association's Electrical Section. Several conflicts in the Manual section on 600-volt direct-current trolley construction were found, and it was recommended that these conflicts be referred to the Power Committee. It also was recommended that due consideration be given to clearance of conductors associated with the overhead electric contact systems in any new clearance specifications.

The study of track and third rail bonds for heavy traction work was continued, and it was recommended that the specifications for stud terminal bonds be revised as suggested in the report. It also was recommended that the methods of joining third rails by other than bonding and methods of applying welded bonds be studied further.

A complete tabulation of oil-electric locomotive operating statistics for 1929-30 was presented by the subcommittee on this subject. The study of train operation, particularly articulated units, was continued, and additional information was given. Data on additional locomotives which have become available since the last report were published, including the motive power for several of the latest electrifications.

Power Division

1. *Manual Review*—Stranded copper wire tables comprising bare concentric soft-drawn copper; bare concentric hard-drawn copper, A.S.T.M. Class A stranding; bare concentric hard-drawn copper, A.S.T.M. Class B stranding; bare concentric hard-drawn copper, A.S.T.M. Class C stranding; and bare concentric hard-drawn copper, extra flexible stranding, were prepared and presented as recommended standards. Work was started on revision of the section on paper-insulated cables. The Manual section on the joint use of wood poles was revised in detail, and was presented for approval as a supplement.

2. *Mercury Power Rectifiers*—This represents the sixth year of study on the subject by this committee. Sum-



Chairmen of Divisions, Engineering Association

- 1—Thomas H. Nicholl, Rolling Stock Division
- 2—Dwight L. Smith, Power Division
- 3—C. A. Harris, Purchases and Stores Division
- 4—C. A. Smith, Way and Structures Division

maries of operating results for the calendar year 1930 are included in tabular form. Another table gives the record of the rectifier units installed or on order in America. The bibliography also was brought up to date.

5. *Catenary Specifications*—A study was made of new types of messenger for catenary construction. A tabulation was given of catenary systems of a considerable number of electrified steam railroads and heavy interurban lines. It was recommended that this study be continued. The study of insulators during the year resulted in the development of several designs for pin type and suspension type insulators for voltages from 0 to 1,500, 1,500 to 3,000, 3,000 to 11,000 and 11,000 to 22,000. It was recommended that this subject be continued. A classification was presented of the various types of supporting structures for catenary lines.

6. *Trolley Wire Wear*—Detailed statistical information relative to trolley breaks was included, bringing the subject up to date through 1930. For the first time, the tables include data on kilowatt-hours and wire used for replacements. A study of the practical and economical sizes and types of trolley support ears for general use was begun. The study of larger sizes of grooved trolley wire was continued, and a proposed revised specification was presented. An attempt was made to determine a fair method of comparing line maintenance performance as an aid to reducing trolley breaks. It was recom-

mended that this subject be continued as the work is considered only a preliminary step that is based on incomplete data.

7. *Trolley Construction Specifications*—This committee presented a revised specification, which was prepared to conform with the latest edition of the electrical safety code, and incorporating the recommendations of former committees. Wherever possible, revisions were made to conform with similar items in the specifications for catenary overhead construction. These revised specifications are stated to be complete and modern, and are satisfactory for adoption. It was recommended that the existing Manual Section D 101-16 be discontinued.

8. *Trolley Wire Reels*—A design for a larger-size reel was prepared for inclusion in the present standards to provide for the new large-size trolley wire recently adopted. There is a tabulation of the capacity of the reels for various sizes of trolley wire. It was recommended that the attention of the users of trolley wire reels be drawn to the fact that more consideration should be given to specifying the use of standard reels.

9. *Trolley Bus Overhead Construction*—Changes were recommended in the existing Manual Section D 106-25, the drawings to be rearranged and additional ones to be inserted, and changes made in several subdivisions. These changes were submitted as an appendix.

10. *Lightning Protection*—After reviewing the reports of last year's committee on this subject, and in consideration of the fact that definite information regarding the effect of lightning on all overhead power circuits is not available, the committee did not believe it was in a position to revise the Manual section on lightning protection at this time. As an appendix, a brief review of information collected in the past two years was given.

12. *Ferrous and Non-ferrous Materials*—The year's report covered briefly the work being done by the Electrical Section, A.R.A., the American Society for Testing Materials, and the American Foundrymen's Association. A bibliography also was given of specifications for coating ferrous materials to prevent corrosion.

13. *Trolley Voltage Surveys*—The question of proper trolley voltage for congested urban distribution was continued. Results of tests made in Cin-

cinnati and in Pittsburgh with reduced voltage in the congested districts were presented. First conclusions show that it is possible to make a considerable saving in power on the basis of the Pittsburgh test. This seemed to be greatest at the lowest practical operating voltage, i.e., 450 volts. At Chicago on the Surface Lines in sufficiently congested areas it appeared possible to reduce trolley voltage without reducing the speed of the cars, and, at the same time, to derive benefit from reduced peak demand. On the Chicago Rapid Transit Lines a substantial saving in power was possible with reduced voltage, but at the expense of speed. In Montreal a considerable saving in energy consumed with a reduction in demand by the use of reduced voltage was possible. In Cincinnati the test demonstrated that a reduction of voltage in the congested areas would cut power costs but little, and can be accomplished only by sacrificing speed in the congested areas. The committee concluded that additional properties should make studies of reduced voltage. It held that reduction of trolley voltage is in some cases not feasible, due to the same substation feeding both congested areas where maximum speed cannot be obtained and other areas where maximum speed can be obtained. It also held that a feasible scheme of providing constant illumination could be provided, and that any reduction in trolley voltage in the congested areas should be used in service only in the event that economies can be realized without reducing car speeds, or without interfering with the operation of cars and associated auxiliaries.

Purchases and Stores Division

1. *Manual Review*—It was decided that the recommended stock book system of controlling materials and supplies appearing in the Manual should be reviewed with the idea of bringing it up to date. Accordingly, it was assigned to Committee No. 6 for study. Progress has been made in the preparation of an index for the A.E.R.A. classification of materials and supplies.

2. *Unit Piling and Standard Packages*—Twenty items were agreed upon for standard packages of material peculiar to electric railways, which are the major users of this class of material. General agreement of railway companies was obtained, and, after a poll of the Executive Committee, the recommendations were referred to the Division of Simplified Practice. After a few minor changes, quantities for the twenty items were agreed upon. The Navy Department and 56 manufacturers and users have accepted the recommendations. The committee is continuing its study of quantities for standard packages for other items common to electric railways.

3. *Stores Investment and Costs*—A questionnaire was sent to various elec-

tric railway companies asking for data on investment in material or supplies for the year 1929. Detailed information on the basis of this questionnaire is included. It was shown that there is an average of 17.41 per cent turnover, or that portion of the stock which is moved monthly in relation to the stock on hand. This is equivalent to an annual turnover of 2.09 times. The per cent turnover figures show clearly that companies

forms and obtaining them, co-operation with government standards of typified forms, regulation of deliveries and centralized control. It was brought out that several large companies were able to reduce the number of printed forms by about half after a study had been made and outlined in a questionnaire sent to the members. The report was submitted as one of progress only, and it was recommended that the work be continued.

Rolling Stock Division

2. *Motor Coaches*—The uniform motor bus specification code was recommended for approval. Progress was reported on the study of a number of subjects, including standard sizes of destination signs and window glass, static testing of bus bodies and chassis, maintenance schedules, necessity for definite oil specifications, chassis lubrication, recent improvements in the manufacture of gear lubricants, and the use of fuel oil for Diesel engines. Information was compiled on mileage run by various companies between chassis lubrication. An extensive survey proved that great improvements had been made in brakes and brake drum material. Disposal of exhaust gases, ventilating and heating were covered in a questionnaire, and tabulated as an appendix.

3. *Car Design*—Tendencies in car design indicate a continuation of greater use of the possibility to improve the appearance of cars. This is shown in lower body floor and roof construction, and in streamline painting effects. Wider windows or post spacings of 36½ to 40 in., as compared to those used in the past of 29½ in., have also been used to emphasize the long, low appearance of the car. Reference was also made to the installation of groups of cars equipped with trucks and motors of the new high-speed light-weight types. Extensive tests were conducted during the year on the Chicago Surface Lines on a number of equipments, including the later type high-speed motors and trucks. A summary of the results obtained is included in an appendix. Another appendix gives power losses in electric street car reduction gears. The report also referred to the work of the Presidents' Conference Committee.

4. *Lighting*—This committee continued its study during the past year on headlighting for electric railway cars. A complete proposed revision of Manual Section D 121-30 on car lighting was presented in an appendix. The principal revisions include recommendations of the use of dash illuminating headlights, recommendations for rapid transit car lighting, a method for computing illumination for various types of cars, together with other essential data. Further investigation was made on the use of 32-cp. lamps for interior illumination of motor coaches. The information gathered was presented in detail in an



Chairmen of Engineering Association Committees

- 1—L. C. Winship, Heavy Electric Traction
 - 2—E. P. Goucher, Co-operation with U. S. Department of Commerce
 - 3—James W. Welsh, Economics of Rolling Stock Application
 - 4—Chas. Rufus Harte, Historical Review of Engineering Association's Organization and Growth
 - 5—W. W. Wysor, Electric Railway Journal Maintenance Contest, Necrology, Nominations, Program
 - 6—E. M. T. Ryder, Welded Rail Joints, Editing of Proceedings
- Chas. H. Jones, Engineering Manual, Subjects

operating buses only have a much higher rate of turnover than those operating railways only, or both railways and buses. The committee recommends to member companies that individual studies be made of investment in material and supplies with a view of securing the highest possible turnover.

6. *Material and Supplies Control*—This committee presented a report of progress only, giving answers to a questionnaire on the subject of stock control, as received from 42 companies.

7. *Handling of Bus Materials*—The report consisted of a discussion of methods of stock control, methods of identification, methods of storing, methods of procurement on supplementary order contracts, regular purchase orders, emergency purchases, and the co-ordination with the manufacturers for proper tagging and marking. It was recommended that the subject be continued, and that detailed data be included in future reports on several of the sections. A number of other features concerning handling of bus materials were suggested as subjects for the committee to investigate.

8. *Handling of Stationery and Printed Forms*—The subject was considered largely from the view of physical control of stationery, methods of preparing

appendix. Another table was presented showing the demand for the twelve-month period, ending May 31, 1931, for street railway lamps, together with other pertinent information.

5. *Car Trucks*—Revision of Manual Section E2-27 to reduce the possible end play of the axle by $\frac{1}{8}$ in. was recommended. A study of nosing was made, with the result of an alternative type of journal bearing with a flat top to eliminate rolling out of place, along with a buttonless axle and wedge which takes all the end thrust on the end of the axle. Another design of flat top bearing was also submitted for use with the standard axle. An alternative design of brakeshoe key was submitted, which is thicker than the standard key, and is designed to prevent loose keys. Replies were received from about 29 companies on roller bearings, but no conclusions were drawn from the data collected.

7. *Trolley Buses*—A set of rules and regulations based on car wiring, but reworded, as proposed by the N.F.P.A. was presented. The latest design of swiveling type shoes has greatly improved operation over the heavier trolley wheel, it is stated. Standardization of motor-mounting bolt holes for the 50-hp. motor was proposed, as well as standardization of preparation of the armature shaft for speedometer or odometer drive, nomenclature and designation of motors and trolley buses. It was recommended that in wiring trolley buses or reading wiring diagrams, the left-hand trolley base be considered as positive.

8. *Air-Operated Car Equipment*—A number of practices tending to reduce the use of air and so prevent overheating of the compressor were recommended. Methods of installation of air piping were proposed. The precipitation of water from compressed air and the main reservoir cooling system was discussed in an appendix, and the method of installing a radiating pipe to eliminate danger of frozen air equipment was proposed.

9. *Noise Reduction*—Investigation of resilient wheels was continued. Tests were made on the Lauhoff type wheels, but have not progressed sufficiently to be presented in the report. Tests made during the year confirmed the previous report that a cushioning of rails in track construction would reduce the sort of noise produced by the car by at least 25 per cent. Sound determinations on gear cases of standard types as compared with similar ones covered with a heavy coating of a rubber-like cement were made. By this method, the noise was reduced as much as 40 per cent. It was recommended that soundproof gear cases, floors, wheels and trolley bases be used, as well as a form of track construction in which the rail vibration is muffled. It was recommended that lightweight cars be developed, with a maxi-

mum of the car structure being spring borne.

10. *Rheostatic Car Heating*—Information has been collected on this subject, and plans have been made to conduct a series of tests on several properties to determine the proportion of heat that can be supplied from a rheostatic source. Those companies which have experimented already show that it is possible to obtain 30 per cent to 60 per cent of the heat required in this manner.

13. *Limits of Wear*—It was recommended that limits of wear be adopted as recommended practice: On interurban cars, no wheels to have more than $\frac{1}{8}$ -in. hollow tread; treads not to be more than $3\frac{7}{8}$ in. wide; original clearance plus wear between pedestal guides and journal boxes to be limited to a total of $\frac{1}{4}$ in. for either lateral or longitudinal movement. Further study of the subject was also recommended.

Way and Structures Division

1. *Manual Review*—Changes in Manual Section W 42-29, specifications for design and manufacture of tie rods, were recommended. It was proposed that a new Manual section be adopted covering recommended standard specifications on track bolts and nuts, to be identical in structure with the A.S.A. specification covering similar material. It was recommended that the A.R.E.A. girder rail section included in the 1929 A.E.R.A. Manual be included in the Engineering Manual of Recommended Standards. Revision of Manual Section W 21-23, specification for quenched carbon steel track bolts be taken up.

2. *Special Trackwork*—Data were obtained on the experiences of the use of the association's design of tongue switches and minor changes in the design for their betterment. Designs were also furnished for expansion joints. Designs for hard center inserts for mates are also included in the special committee's program.

4. *Wheel and Rail Contours*—Conclusions of the committee indicated that the problem is not very practical of using cylindrical wheels with rails having curved or sloping heads.

5. *Wood Preservation*—Information was given on the number of subjects, including economies obtained by operating utilities through the use of treated timber, possibilities of a combination preservative and fire-preventive treatment for timber, preservation of timber for use in car and bus construction and maintenance, and practice of boring preserved ties for spikes. The committee also stated that the subject has been quite thoroughly covered, and recommended that a small membership be continued to keep the industry in touch with new developments.

6. *Arc Welding*—Several changes in specifications for welding rods were proposed for consideration of the American Welding Society. Maintenance of the

present contact and working arrangement with the American Welding Society and the A.S.T.M. was recommended. It also was proposed that the committee personnel be reduced materially until such time as there is work of a more definite nature to be undertaken.

7. *Alloy Steels for Special Trackwork*—Tests were continued on welds on special steels, including 11 to 14 per cent manganese steel, chrome-nickel steel and silico-manganese steel. These welds were made with various electrodes. A truncated cone was substituted as a drop test specimen for the sharp-pointed cone used in last year's tests. Detailed test results and a discussion by the members of the committee making the tests were included.

These tests covered a wide range of compositions and physical characteristics of alloy steels suitable for special trackwork. They were made in several different laboratories under the direction of the chairmen of the subcommittees to which they were assigned. The indication was that the weld metal deposited should be of a hardness approximating that of the parent metal. In that event the cold working due to the blows of the hammer was better distributed and the deformation of any one part lessened. In general, the finding was that progress is being made, and that there is a trend toward definite conclusions which will be of great value in field work.

It was recommended that the study of alloy steel in use in special trackwork and the methods and materials for welding be continued. It also was recommended that the assignment of developments in the Sandberg sorbitic process of rail hardening be assigned to the committee on rails, No. 14.

8. *Pavement*—Studies of types of pavement, contour and foundation, and recommended types of construction suitable for modern heavy load conditions on city streets, were made by this committee. Attempts of previous committees to design typical track and pavement structures were not practicable, according to the report. A preliminary discussion of the economics of track pavement was made by this year's committee. This outlined a method of attack and presented formulas for investigating annual cost. It was recommended that the general subject be continued under the latter title.

14. *Rails*—A form for branding rails was recommended for adoption. The relation between the rail wear on a given section of track approaching stops and between stops was furnished by the Cleveland Railway, the results being given in an appendix. Information was presented on the mathematical properties of the association's standard girder rail sections. It also was proposed to include in the Manual the calculated weights of various rail sections.

Fake Accidents and Legal Problems

Considered by Claims Men

WHAT they lacked in numbers those in attendance at the sessions of the Claims Association on Tuesday and Wednesday made up in intimacy and enthusiasm. The opening session on Tuesday was begun as a luncheon meeting, continuing through the afternoon. C. E. Redfern, president of the association, and claim agent United Electric Railways, Providence, reviewed briefly the work of the previous year. Following routine business, there was lively consideration of the question of whether the association should act as a clearing house for information concerning fake claimants. The issue was discussed pro and con, as was also the question of the training of claims investigators. For various reasons, the proposal was abandoned that a formal organization be set up through which a clearing house might be developed in the claims field, but it was decided that the various companies should apprise each other through the association where cases arose that were palpably fraudulent in their aspect.

At the session on Wednesday, J. S. Kubu, chairman of the Committee on Uniform Negligence Law, and assistant superintendent of the accident department Cleveland Railway, presented his report. He went quite thoroughly into a discussion of the procedure connected with the introduction of a bill of this kind in the recent Ohio Legislature, a bill it was felt would have passed except for the confusion incident to the last minute conclusion of business in the Legislature. The bill was contested by the insurance group, but the Cleveland Railway openly sponsored the measure. In fact, officials of that company spoke in favor of the bill at Columbus. During the discussion, it was brought out that a court decision has been rendered in Michigan in which it is distinctly held that passengers in automobiles are not entitled to recover where negligence has been proved. H. R. Goshorn, general claim agent Philadelphia Rapid Transit Company, explained a somewhat similar law passed by the Pennsylvania Legislature four years ago.

Since G. T. Hellmuth, chairman of the Committee on Claims Association Work and its relation to the American and the Transportation and Traffic Associations, was not able to be present, his report was read by J. W. McCloy, who acted as secretary of the meeting. The opinion expressed was that the Claims Association



C. E. Redfern
President

tion can function most fully and in a most valuable way through separate sessions. The report by Mr. Hellmuth was received and placed on file. Secretary G. C. Hecker of the association was then called on by Mr. Redfern to explain the problem of the relation of the affiliated associations to the parent association. Mr. Hecker went into the relationship in some detail, but said that it seemed to him the present method of procedure was somewhat cumbersome in that, under it, an executive set-up was imposed upon the separate associa-

tions similar to that of the main association, a set-up that militated against the most expeditious handling of association affairs. It was his opinion that under any change made in the constitution, the claims men should be fully represented in the main committee activity. It was up to them to evolve a plan which they considered best suited to their requirements, and then to fight for it.

Owing to the unavoidable absence of Hon. Horace Stern, of Philadelphia, the address intended to be delivered by him was not made.

Since it also was impossible for R. H. Nesbitt, attorney for the Ohio Edison Company at Akron, Ohio, to be present to deliver his paper, "The Inter-relation of Claim and Legal Departments," it was read ably by Mr. McCloy. This paper was shot through with the dry humor for which Mr. Nesbitt is so well known.

At the conclusion of the reading of Mr. Nesbitt's paper, Mr. Redfern called upon H. R. Goshorn, the dean of the profession, to address the meeting. Mr. Goshorn, was visibly moved by this mark of recognition. He explained that it had been possible for him to attend only two of the meetings held in recent years, but that this had in no way decreased his real interest in the affairs of the claim agents and the problems that confronted them as a body. At the conclusion of Mr. Goshorn's remarks, Mr. McCloy referred to the fact that he had recently been apprised of the death in Seattle of George Carson, who was president of the association in 1915 and 1916, and who had long been active in claims work, having started with the Seattle Electric Company many years ago. Subsequently he served for a short while with the Fifth Avenue Coach Company in New York, but returned to Seattle. A resolution of sympathy was adopted for transmission to Mr. Carson's family.

J. W. Giltner was then installed as the new president. He said that the responsibility for the work of the association was not only his, but that of his associates. He made a strong plea for cooperation to re-establish the work of the association. As he saw it, there was some merit perhaps in Mr. Hecker's proposal to merge the work of the Claims Association more closely with that of the main body, but he apparently was not fully convinced that the method of procedure which has been suggested



Chairmen of Claims Association
Committees

- 1—Wallace Muir, Nominations
 - 2—J. S. Kubu, Uniform Negligence Law
 - 3—G. T. Hellmuth, Study of Claims Association Organization
 - 4—Bert C. Wood, Claims Department Practices
- J. W. Giltner, Subjects

was sufficiently tangible for him to attempt to subscribe to it at this time. In concluding the session, the past-president's badge was conferred upon Mr. Redfern. The roster of officials for the new year as elected following the report of the Committee on Nominations was as follows:

President—J. W. Giltner, chief claim agent Northern Ohio Power & Light Company, Akron, Ohio.

First Vice-President—L. H. Butterworth, claim attorney Boston Elevated Railway, Boston, Mass.

Second Vice-President—Trevor C. Neilson, claim agent of the East St. Louis

& Suburban Railway, East St. Louis, Ill.

Third Vice-President—G. T. Hellmuth, general claims attorney Chicago, North Shore & Milwaukee Railroad, Chicago, Ill.

Secretary-treasurer—Guy C. Hecker, general secretary American Electric Railway Association.

Executive Committee—Edwin J. Page, general claim agent United Railways & Electric Company, Baltimore; S. A. Bishop, general claim agent Pacific Electric Railway, Los Angeles; J. S. Harrison, general claims attorney Jacksonville Traction Company, Jacksonville, Fla.; Frank D. Edmonds, supervisor of claims Interborough Rapid Transit Company, New York.

times not only tends to destroy initiative on the part of the claim agent, but prevents him from maintaining a well-organized, close-knit and efficient claims organization.

I conceive it to be the duty of a well-organized claim department to make a prompt and careful investigation of each and every accident. The care and diligence to be used cannot always be measured by the apparent seriousness or lack of seriousness of the injury. In making an investigation it is, of course, important to locate all of the witnesses possible, but it is much more important that the statements actually taken reflect the facts as the witness knows and observes them.

From every viewpoint, in my opinion, it is most important that the statements taken from witnesses reflect the facts. The opinion of the legal department on the question of liability is based upon the facts which appear in the file. It relies upon the statements secured by the investigator as evidencing the facts surrounding the happening. I know of no more disconcerting thing in the trial of a case than to find that the statements set forth as facts by some of the witnesses are not the facts at all, but have been colored and distorted either by the witness or by the investigator taking the statement. In these days I am quite certain that the company, and its legal department as well, would prefer having the facts in advance, secured by a proper investigation, than to ascertain them afterwards and perhaps in the midst of a trial. The importance of securing the truth in investigation should be brought home to every investigator.

Perhaps the most frequent point of difference between the claim and legal departments has to do with the value to be placed upon a particular claim. Generally speaking, the legal department can determine the question of liability, and it is seldom that there is any difference of viewpoint between the lawyer and the claim agent upon that subject. However, when we come to consider the value of a claim there is frequently a divergence of opinion.

Personally, however, I feel that the claim department, and particularly the chief claim agent, if he is an experienced man, as he of course should be, is in a better position to judge the value of a claim than the legal department.

In our organization the claim department has followed what I regard as a very good practice by endeavoring to give the legal department certain ideas with regard to the claimant and the witnesses. The file generally contains statements which give in more or less detail the appearance and characteristics of the claimant as the claim agent observes them. The same is done as to the witnesses. This information is frequently very helpful to the legal department in assisting and fixing the valuation upon the claim.

The Inter-Relation of Claim and Legal Departments

By

R. H. NESBITT

Attorney Ohio Edison Company
Akron, Ohio

AT TIMES I have felt that there was a tendency on the part of some utilities to underestimate the importance of the claim department as a part of the organization. Some look upon it as a sort of barnacle, not ranking in importance with other parts of the work. In my humble judgment there is no place where the earnings can be more easily and quickly dissipated than through an undermanned, poorly organized and poorly supervised claim department. Not only is the work important from the standpoint of financial outlay, but it is equally important from the standpoint of public relations.

It is important, if the company is to have the confidence of the public which it serves, that its claim work be done intelligently, efficiently and in such manner as to leave as good a feeling with the claimant as is possible.

The taking of intelligent statements concerning accidents and the effecting of fair and prompt settlement is a matter that requires not only training but the right type of individual. In making investigations it is true as a rule that the sympathies of a witness to an accident are generally with the injured party, and consequently it is not easy to overcome this feeling and secure from the witness an actual statement of the facts. The witness is frequently hostile toward the company by reason of some real or fancied grievance growing out of some past experience in which he, himself, or some member of his family was involved. Again, the

witness is busy and does not want to be brought into the controversy. All of these factors make the work of the claim agent extremely difficult and, in my judgment, it requires a trained man and one qualified by temperament to cope with the situation which he meets.

The work of the claim agent is not only difficult but in many ways it is not very satisfying. You are never quite certain whether the settlement you have made is a good one, or a fair one; whether you have paid too much or too little; whether the injury claim is a real one or merely fanciful. You have no stick by which the particular injury can be measured. You are dealing with a very intangible commodity that has no market price—a fixed definite amount that can be ascertained by consulting some price list.

Moreover, I want to speak briefly concerning the matter of its supervision. In the first instance, I believe that there should exist between the lawyer and the claim agent a feeling of mutual respect. By this I mean, not only the respect which one man has for another as a man, born of the feeling that such a man is an honest, decent, right-thinking and right-acting individual, but a respect also for the work or task that each is attempting to perform. Sometimes there may be, and perhaps is, a tendency on the part of the legal department to forget or overlook the fact that the claim department has its own distinct job. Such an attitude is not productive of the best results and at

Accountants Study

Apportionment of Costs



C. E. Yost
President

REDUCED company income has given the accountant another grave responsibility, that of aiding in keeping up the net. Steady trimming of the expense account, reducing schedules, and saving wages, power and material, have necessitated an enormous amount of work by the accounting department in adjusting the various items and calculating the final results. With the expression of this thought, C. E. Yost, president of the association and treasurer and assistant secretary Delaware Electric Power Company, Wilmington, Del., opened the convention of the Accountants' Association on Tuesday afternoon. Although the association's members have been pressed for time because of the present emergency, the several committees, Mr. Yost stated, had labored diligently in the preparation of valuable reports. President Yost referred to the publication of answers to various accounting questions submitted to the committee on standard classification of accounts, and to the report on budgetary control, a timely contribution for guiding in the preparation of the annual budget for next year.

Following the presidential address, E. H. Utley, Jr., read the report of W. L. Davis on the annual convention of the National Association of Railroad and Utilities Commissioners. Mr. Davis referred to three committee reports of interest to the accountants and gave extracts from the recommended provisions for uniform laws on the issuance of public utility securities.

The report of the Committee on Standard Classification of Accounts, of which M. W. Glover, general auditor West Penn Railways, is chairman, was presented by E. A. Tuson, general auditor Public Service Co-ordinated Transport. Discussion of various costs offering difficulty in classification was entered by J. E. Heberle, P. C. Kilfoyle, L. P. Hixson and J. P. Hudson.

Mr. Tuson also read the report of the Subcommittee on Bus Accounting, of which he is chairman. Mr. Tuson said that the steam roads were also vitally interested in this work and supplemented the regular report with a statement of the several states that had adopted the standard classification in whole or in part.

An abstract of the report of the Committee on Budgetary Control, of which R. Gilman Smith, statistician the

North American Company, is chairman, was read by J. E. Heberle, assistant to the president of the Capital Traction Company. It was brought out in the discussion by C. R. Mahan, W. H. Scott, C. E. Yost, E. A. Tuson, J. P. Hudson, and C. Frankland that a budget is a real boon, particularly in a time like the present, if the department heads are alive to the responsibility of keeping within the budget. The above reports, as well as the other two referred to, are abstracted on the following pages.

Officers for the coming year, nominated by the committee headed by Edwin H. Reed, vice-president, Utilities Gas & Electric Company, are:

President—J. E. Heberle, assistant to president Capital Traction Company, Washington, D. C.

First Vice-President—E. A. Tuson, general auditor Public Service Co-ordinated Transport, Newark, N. J.

Second Vice-President—C. R. Mahan, comptroller Chicago, North Shore & Milwaukee R.R., Chicago, Ill.

Third Vice-President—E. H. Utley, Jr., general auditor Chicago, South Shore and South Bend Railroad, Michigan City, Ind.

Members of the executive committee—J. D. Evans, general auditor St. Louis Public Service Company, St. Louis, Mo.; John H. Moran, general auditor Boston Elevated Railway, Boston, Mass.; R. Gilman Smith, statistician the North American Company, New York, N. Y.; and C. Frankland, auditor Cincinnati Street Railway, Cincinnati, Ohio.

These officers were unanimously elected to head the association.

At the opening of the Wednesday session, C. R. Mahan stated for J. D. Evans, chairman of the Committee of Fare Collections, that no formal report had been prepared. Mr. Evans, however, prepared a comprehensive description of the fare structure of St. Louis and the systems of collection and accounting used in their connection, and Mr. Mahan abstracted its contents.

Mr. Mahan also presented the report of the Committee on Property Records, of which he is chairman. This report is abstracted elsewhere.

The accountants were addressed at this session on "Cost of Fare Collections" by C. W. Stocks, editor of *Bus Transportation*, and on "Individual Route Costs as Influenced by Fixed Costs" by I. O. Mall, research engineer transportation, New Orleans Public Service, Inc. Mr. Stocks gave a comprehensive list of all costs, both capital and operating, involved in the collection and accounting of fares, and urged that companies revamp their systems for the purpose of reducing expenses.

It was brought out in the discussion of the first paper by J. E. Heberle, C. E. Yost, C. H. Allen and C. B. Trubenbach that complicated fare systems for buses slowed up the service, involved large ticket costs, required extensive accounting and resulted in more errors. It was suggested that companies analyze their systems of fares to see to what extent they might be simplified.

Following Mr. Mall's paper, a number of questions were asked on the bases used in the computation of route costs and on the extent to which such a survey could be used for an entire system. E. A. Tuson, J. E. Heberle, Dean J. Locke, C. E. Yost, H. R. Bigelow and E. H. Utley, Jr., contributed in this discussion.

Following the report of the Committee on Resolutions, read by W. H. Scott, the new officers were installed and the past-president's badge given to C. E. Yost. The incoming president, J. E. Heberle, urged the members to become familiar with all of the departments in the transportation business and to strive for a maximum degree of cooperation in the solving of company problems.

Cost of Collecting Fares

By

C. W. STOCKS

Editor *Bus Transportation*



C. W. Stocks

WITH the growing tendency to use several classes of fares, it would seem that the time is right for managements to analyze the methods and practices that have grown up over a long period of years, to see if, by revamping, improvements cannot be made that will effect a material saving in the expense of this most important phase of transportation.

To simplify the problem, so it may be easily understood, and in order that the full cost may be included, "The Cost of Collecting Fares" can be broken down easily into major items, the sum of which will represent the total money cost. These are: (1) Interest on plant and equipment used; (2) cost of supplies; (3) labor required for auditing and checking collections; and (4) secret service inspection costs.

A listing of the capital charges would include the following:

1. Investment in storeroom fixtures—vaults, shelving, office furniture.
2. Investment in distributing facilities—boxes, trunks, bags, locks, keys, trucks, cars.
3. Investment in facilities at point of issuance—safes, shelving, locks, keys, office fixtures, furniture.
4. Investment in collection devices for use on cars and buses—overhead registers, registering and locked fare boxes, turnstiles.
5. Investment in mountings on cars and buses for collection devices.
6. Boxes, receptacles, etc., provided fare collectors—change makers, ticket punches, work boxes, change booths.
7. Fixtures and furniture at receiving points for vehicle operators—coin counting devices, safes, money bags.
8. Fixtures and furniture at auditing points for revenue turn-ins—furniture,

safes, calculating and adding machines, coin counting mechanisms, wrapping machines, ticket and transfer counting machines or weighing devices, other miscellaneous equipment.

9. Stock of repair parts for maintaining fare collection devices—fixtures, benches, tools, test blocks.

Under operating costs the following items should be listed:

1. Printing cost of tickets, tokens, and transfers.

(A) *Tickets*—Number and class of each printed per year, number sold (recorded in ticket float account), number collected, per cent of waste or waste cost, shipping charges from printer.

(B) *Tokens*—Number and classes purchased, number sold, number collected, replacements needed, shipping charges from manufacturers.

(C) *Transfers*—Style and type used, individual routes or system, cost of printing, number issued, number collected, shipping charges from printer.

2. Storage and auditing charges—rent of storage space for tickets, tokens or transfers prior to issuance, wages of storekeepers, auditors for checking purposes and other employees, routine stationery costs (report blanks, record books, letterheads, other office supplies).

3. Distribution costs on system for tickets, tokens and transfers—repairs to boxes, trunks and bags or other means of shipment, trucking charges from storerooms to points of issuance. (Labor, gas, oil, maintenance of vehicle.)

Determining Route Costs

By

I. O. MALL

Research Engineer, Transportation
New Orleans Public Service, Inc.
New Orleans, La.

IT IS impossible to measure the characteristics of route performance by a casual perusal of conventional system records. It is generally recognized that in a composite railway system there are paying lines and non-paying lines, and that the better paying lines must help support the lighter traffic or feeder lines. With declining business and shifting traffic conditions, it becomes imperative that studies be made of individual routes. Complete elimination of some routes may be in order. Substitution of cheaper service may be practical. To measure accurately these factors, it is desirable to segregate the system into independent routes, and to develop the traffic characteristics and operating costs for each route with particular regard to fixed charges.

Determination of the fixed charges for each route requires that the value of all physical property be apportioned to the respective routes. The classified accounts established for fixed capital records are of such a general nature that they do not facilitate such a segregation. It becomes necessary, therefore, to break down these accounts into such units as will permit this allocation, and bring out those salient features from which component costs may be formulated. The basis of the investment value may be reproduction cost as of specific date, or, if figures are



I. O. Mall

available, as determined by the book value of fixed capital.

It is of particular importance that those items of physical property specifically chargeable to a route be shown separately from the remaining items, which are applicable against the system as a whole and chargeable to each route on an equitable basis. The problem of roadbed valuation is complicated because of the various types of track construction encountered, and the further fact that the classified accounts treat the unit parts of the structure as separate and apart from the whole. The amount of the roadbed investment

for a particular route is measured largely by the physical requirements of the streets over which the route must pass.

It is also desirable to develop a unit value for each type of street car operated. Here again the problem is complicated, in that the classified accounts separate the electrical equipment of cars from the cars themselves. A detailed valuation of individual cars with their proper equipment must necessarily be compiled.

In one table may be outlined the investment by divisional items for a typical car line, in relation to the investment for an entire system of which this line is a part. This table also should show the amount of fixed

charges consisting of interest, renewals and replacements and property taxes. The divisional maintenance and operating expenses for this same line may be shown in a second table. Unless special cost records have been developed, these charges must necessarily be taken from the classified accounts and allocated to the respective routes on an equitable basis. From the developed costs provided by these tables, there may be shown in a third table an income statement indicating the return on the investment required for its operation. A similar statement for each route of a system provides an indication of the relative ability of the respective routes to absorb the investment and operating costs of the entire system.

draft as it now stands is in substantial harmony with the A.E.R.A.A. standard classification.

Budgetary Control

Last year the committee ascertained the reaction of many railways to the usefulness and desirability of budgetary control. Among other questions, member companies were asked whether the committee should make a detailed study of budget procedure, and, if so, in what manner such a study could be made most useful to electric railways. It was the majority opinion of the replies received that the committee should undertake an investigation of this sort.

An examination of the suggestions offered to the committee indicated that the reporting railways were most interested in the following phases of budgets and budgetary control:

1. Clarifying the use and functions of the budget idea.
2. Outlining the method and technique of budget procedure.
3. To present for study a number of budget systems, methods and forms actually in use in other companies, so that comparisons may be made and desirable modifications instituted.

In its report, the committee felt it desirable to clarify the use and functions of the budget idea first.

Following a detailed outline and description of the budget system, the report appended explanations and typical forms covering the operating budget and cash requirements budget in use by the Cincinnati Street Railway, and the construction budget procedure in use by the subsidiaries of the North American Company.

Property Records

Property records of a carrier should be kept in sufficient detail to determine and assemble readily the various elements of costs comprising the plant account for the specific purpose that the information is intended to be used. Financing capital expenditures, rate making, and the creating of reserves for depreciation, or renewal or retirement, all are dependent upon certain recognized elements contained in the investment of road, equipment and property accounts.

The purpose of the committee was not to recommend any fixed procedure at the present time, but rather to stimulate the interest of the accountants in this important phase of accounting, in order that the association may be in a better position to consider the problem when it may become necessary to comply with regulations of a uniform classification, prescribing definite units to be considered in the matter of depreciation.

The report outlined in detail the procedure now followed by one of the member companies which finds it satisfactory to meet all present requirements.

Accountants' Committees Make Valuable Reports

FOUR major committees of the Accountants' Association prepared reports during the year for presentation at the convention, the Committees on Standard Classification of Accounts, Bus Accounting, Budgetary Control and Property Records. The Committee on Fare Collections made no formal report or recommendations.

Standard Classification of Accounts

On April 2, 1917, the Interstate Commerce Commission issued Bulletin No. 14, listing 440 interpretations in answer to questions relating to the uniform system of accounts issued by the commission in 1914. Since that time, many more questions have been sent in for interpretation. The accountants' committee has an arrangement with the Bureau of Accounts of the I.C.C. to the effect that before rendering a decision on any questions raised, the bureau will submit the questions and proposed answers to the accountants' committee for consideration and discussion. The important questions, secured from the committee's files, were printed along with the answers in the appendix of this year's report. The answers have not been formally issued by the commission, and are, therefore, subject to revision. A total of 146 questions, covering the classification of many types of charges were answered in the report.

Bus Accounting

During the past year the work has been almost entirely limited to contacts with other bodies looking toward the adoption of a uniform accounting system



Chairmen of Accountants' Association Committees

- 1—W. L. Davis, Representative for Accountants' Association at Annual Convention of the National Association of Railroad and Utilities Commissioners
 - 2—R. Gilman Smith, Budgetary Control
 - 3—M. W. Glover, Standard Classification of Accounts
 - 4—E. H. Reed, Nominations
 - 5—Charles R. Mahan, Property Records
 - 6—E. A. Tuson, Subcommittees on Bus Accounting
- J. D. Evans, Fare Collections
J. E. Heberie, Subjects

that would be accepted and recognized throughout the country. The committee's contact with the Interstate Commerce Commission resulted in the drafting of a tentative classification which the commission, however, has not yet seen fit to issue. The main reason for this is that Congress has not yet given the commission authority over motor bus operation. Pending the enactment of some such legislation, the Bureau of Accounts is holding the matter in abeyance instead of submitting it to the various State commissions and other interested bodies for their approval. It should be remarked that the tentative

T. & T. Association Studies

Results of Committee Work

COMMITTEE accomplishment during the past year formed the basis for the major part of the discussion at the two sessions of the Transportation and Traffic Association at the Atlantic City convention. "Never, during my sixteen years service with this association," said President Paul Wilson in his opening address, "have the members devoted so much effort or given so willingly of their energy for research work than during the past year. The plan decided upon in California in 1930, to bring all committees together during the year, was carried out in meetings at Cincinnati and Chicago, and the results have been so satisfactory that I heartily indorse the continuation of that policy."

Mr. Wilson discussed current economic conditions as they affect transportation and traffic. "How is it possible," asked Mr. Wilson, "to furnish a reliable public transportation service, a rapid service, a safe service, comfortable and economical transportation, if we are not to be protected by adequate regulation of traffic? How shall we meet the competition of the privately owned car, street stored at public expense? How much longer shall we discomfort our patrons to avoid collision with traffic forced into the path of our vehicle to avoid the parked vehicle? The franchise right to transport passengers for hire is a mockery when the streets in which this right has been given are contracted from highways to lanes and at times to "no thoroughfares"? The monopoly of the public carrier in most cities is today synonymous with liability. It has been a frequent plaint of many of us in this association that the executive heads of our companies have been too often unacquainted with their business as seen through the eyes of the traffic employee. I firmly believe that our present adversity may, in this particular, be a blessing disguised, because with expense mounting in direct proportion to the growth of this congestion of our streets increased income cannot be secured, for we are prevented from the real use of the facilities we operate. No problem in this industry is so pressing for solution as how to remove the unnecessarily parked automobile from the public highway. We still are the carrier



Paul E. Wilson
President

of a majority of the people. Surely the rights of the majority must prevail and just as surely must we assert their rights."

Following Mr. Wilson's opening address, the association heard the annual reports of the Executive Committee and the secretary-treasurer, and approved the recommendations of the Committee on Nominations by electing the following officers for the coming year.

President—R. N. Graham, vice-president and general manager Youngstown Municipal Railway.

First Vice-President—F. L. Butler, vice-president Georgia Power Company.

Second Vice-President—Adrian Hughes, Jr., superintendent of bus transportation, United Railways & Electric Company, Baltimore, Md.

Third Vice-President—D. L. Fennell, general superintendent of transportation, Kansas City Public Service Company.

Secretary-Treasurer—Guy C. Hecker.

For members at large to the executive committee:

C. H. Evenson, superintendent transportation Chicago Surface Lines.

W. W. Holden, manager San Antonio Public Service Company.

R. W. Emerson, vice-president Cleveland Railway.

R. W. Emerson, vice-president Philadelphia & Western Railway.

The first subject brought to the attention of the association was that of the

transportation employee. Clinton D. Smith, general manager Philadelphia & Western Railway and chairman of the Committee on the Transportation Employee, read the committee's report which recommended the broader use of the industrial talking movie in educational work. The recommendations of this committee will be found elsewhere in this issue.

A paper prepared by R. S. Soule led the discussion on this report. He indorsed the recommendation of the committee for the use of industrial talking pictures, but added that in his opinion it should in no way interfere with the conference method of education which has been so successful.

The report of the Committee on the Passenger was then presented by W. B. Brady, vice-president Central Public Service Corporation. The report summarized an intensive study on the subject of surveys and their use in a number of cities throughout the country. This committee urged the use of employees for making the survey. An abstract of the report follows this article.

A. F. Blaser, chief engineer Cleveland City Commission, in a prepared discussion read by the secretary, summarized this report on the passenger by pointing out the likes and dislikes of the public at large. In substance, he showed that a company operating with low fares and convenient transfer system, with speed, comfort, convenience, economy and dependability gave a security to the public, not only to the habitual rider but to the occasional rider as well.

A. J. Fink, director of transportation St. Louis Public Service Company, and J. H. Pritchard, manager Lynchburg Traction & Light Company, Lynchburg, Va., discussed the subject of transportation surveys in St. Louis and Portland, Ore., respectively. Mr. Fink told of the general merchandising plan being carried on by his company and showed how, by use of personal contact and the radio, the public was kept informed of major improvements and developments. He particularly explained how the personal element phase of the survey overcame the obstacles in changing operations of lines from two-man

to one-man operation. Mr. Pritchard based his discussion on the transportation analysis made in Portland, Ore., where he was located before going to Lynchburg. He stated that the survey there brought to the front such criticisms of company operations as inconvenient transfer points, lack of comfort, poor ventilation, inadequate knowledge of schedules, safety, and claims practices.

Although it was conceded that a transportation survey was, in some form or other, necessary and desirable in giving the public what it wanted, there was a pronounced dissent to the method outlined in this committee report. Alonzo R. Williams, vice-president and general manager United Electric Railways, Providence, R. I., J. B. Stewart, Jr., general manager in charge of operation Cincinnati Street Railway, and Eustace Smith, Jr., executive assistant Toronto Transportation Commission, frankly opposed the employee personal contact with the public in the matter of surveys of this nature. Mr. Williams obtains information of the public's wants through his employees in every-day contacts without special solicitation. Mr. Smith explained the functioning of a transportation research department in Toronto and how it keeps in contact with public desire and opinion for the guidance of his company's development and improvement programs.

R. N. Graham, vice-president and general manager Youngstown Municipal Railway, and W. W. Holden, manager San Antonio Public Service Company, expressed the opinion that personal contact surveys emphasize details of operation which are sometimes overlooked by the management, and that by means of these surveys criticisms and comments are obtained from people who are not regular passengers. H. R. Biery, director of public relations Cincinnati Street Railway, asked the association to give special consideration to the point brought out in the committee report with regard to special or reduced fares in the evening hours when groups of several persons or families usually avail themselves of private transportation vehicles.

The second session of the association was also devoted to the study of committee reports. The report of the Committee on Operating Economics was placed before the meeting, approved and accepted without reading because Joe R. Ong, director of research Cincinnati Street Railway, chairman of this committee, used this report as the basis of his address before the general session on Thursday morning. The report is abstracted elsewhere in this issue.

C. W. Wilson, manager of research department Pittsburgh Railways, as chairman, reported for the Committee on the Movement of the Vehicle. This report presented a study of many factors

of operation, equipment and traffic which affect the movement of street cars and buses in the city streets. An abstract of this report appears elsewhere.

This report brought out a long and interesting discussion. D. J. Graham, manager of railway utility Winnipeg Electric Company, led the discussion by commenting on equipment, schedules, car stops and traffic interference. He recommended reconstruction of cars to obtain the best possible circulation of passengers, improved braking equipment to obtain faster deceleration rates, the adoption of motors to obtain higher speeds, and the installation of better seats, good lighting and ventilation.

Burton Marsh, traffic engineer City of Philadelphia, was the second speaker in this discussion. He commented on the report, and, from the standpoint of equipment said that the railways had to improve their equipment to set aright an automotive-minded public. He urged the railways to lead in fostering intelligent traffic regulation by community officials, and pointed out the necessity of discipline in the operation of traffic systems. He recommended the use of safety zones wherever possible and stated that railway managements could be of great help to traffic officials in getting these established. Mr. Marsh discussed signals and other devices for traffic control.

E. J. McIlraith, staff engineer Chicago Surface Lines, offered several

constructive criticisms of the report. He objected to a statement which indicated that the gas bus and trolley bus are generally accepted as being better able to negotiate modern traffic. He stated very emphatically that under like conditions of traffic density, street cars will move at greater speeds than gas buses or trolley buses. Mr. McIlraith discussed schedule construction and maintenance and pointed out the necessity for having experts do the engineering work in the construction of schedules.

A. R. Williams, vice-president and general manager United Electric Railways, Providence, stated that management must approach the problem of vehicle movement from the angle of the community as a whole and recommended co-ordinated effort with city authorities to remove factors which are now hindering efficient movement.

T. Fitzgerald, vice-president and general manager Pittsburgh Railways, told of the accomplishments in Pittsburgh as a result of an expert engineering approach to the subject. He told how the rewinding of motors on cars had permitted speed increases of as much as 17 per cent and showed how the faster service had increased revenues.

At the end of this session Paul Wilson, as president of the association, installed the new officers and received the past-president's badge from R. N. Graham, the incoming president.

T.&T. Committee Accomplishments

The Passenger

This report presented a plan for obtaining a qualitative analysis of the business of transportation. It stressed the benefit which will accrue to any company which goes out, with its own men or with professional outside help, to determine the sales possibilities of the product it has to offer to its local public. This not only brings to the knowledge of the residents through the visit of a courteous employee the existence of an up-to-date transportation system ready and anxious to serve them, but these same employees return to the office and bring not only that criticism which makes for more efficient service but encouragement as well and "leads" for the further sale of transportation.

Furthermore, in their capacity as interviewers the men meet the public in an entirely new relation and have an opportunity perhaps for the first time for many of them to obtain the point of view of the passenger.

In cities where surveys have been made, careful study was made in advance in order to obtain opinions from representative sections of the community. Such sections were divided

into income groups, groups living near the established transportation facilities or farther away from them, automobile owning and non-automobile owning groups, etc.

In the group living at a distance from established facilities, the predominant demand was for some kind of transportation, both from owners of automobiles as well as non-owners. These surveys are, in fact, the finest evidence ever collected of the essential part that public transportation plays in urban life. Many were assured by real estate agents that such transportation would be provided, but now blame the transportation companies for the plight that they are in.

These surveys establish the rapidly growing realization on the part of owners of the difficulty of using automobiles in cities except at night, due to traffic congestion and parking troubles. But at night, for attendance at places of amusement the automobile shows no waning popularity. This is partly because such use is frequently for several persons or whole families where the cost of individual street car rides becomes large in proportion. The committee believes that earnest attention

should be given to the possibility of winning back these family groups through some form of fare reduction during the off peak hours.

These surveys showed the transfer is by no means popular, especially in cities where winters or summers are severe. Evidence shows that passengers will do much to avoid the inconvenience of transferring. The committee urged the necessity of a careful study of routing with more consideration to the passenger and perhaps a little less to the operating department.

The Transportation Employee

Particular attention was given in this report to a recommendation that the development of the transportation employee be facilitated through the use of the industrial talkie. Numerous practical methods were found on many properties for training transportation employees for higher standards of service. It was the opinion that the industry should concentrate on the supervisors to train them for higher standards of performance. It was convinced that success of training or sales programs required first that the supervisory group become not only sales-minded but also fully competent to enforce training programs.

Practices used by competitors in carrying on their sales training programs were summarized. Tire manufacturers and distributors of automotive fuel supplies use the industrial talkie extensively in their sales development schedules. For instance the difference between profitable and unprofitable operation of a service station apparently depends upon two major factors, which have analogies in the transportation field:

1. Keeping the customer's gasoline tank filled, his engine properly supplied with oil and his car adequately equipped with tires.

2. Making the sale the occasion for a perfect contact.

The chief competitor, therefore, is the service station as much as it is the automobile itself. Hence recognition must be given to the sales instructions for service station attendants, a group who in average intelligence are comparable with the operators in the transportation industry. This method involves the industrial talkie to a greater degree than any other item. It has the following advantages:

1. Eliminates unprepared speeches and instructional programs.

2. Avoids repetition of statement and, therefore, boresome material.

3. Secures the most effective delivery of the instructor or executive.

4. Affords unlimited use, and conserves time.

5. Secures the talent of executives now going to waste for lack of time to make contacts with employees.

6. In training and sales programs, the talkie secures in dramatic style: (a) Vis-



Chairmen of Transportation and Traffic Association Committees

- 1—Samuel Riddle, Nominations
- 2—L. C. Datz, The Equipment
- 3—Clinton D. Smith, Transportation Employee
- 4—C. W. Wilson, Movement of the Vehicle
- 5—Joe R. Ong, Operating Economics
- 6—W. B. Brady, The Passenger

ual illustration of sales principles; (b) carefully prepared instruction; (c) 100 per cent standardization of instruction; (d) maximum coverage of employees.

The committee believed it would be possible to prepare industrial talkies which would include fundamentals of training applicable to any transportation company. It discounted the contention that each company has a local situation which would prevent the adoption of a general film. Attention was drawn to the fact that competitors refrain from the use of a home-made preparation of industrial films but present their sales problem to specialists who properly dramatize the situations and use the technique possessed only by a film service organization.

The committee recommended that an appropriation be authorized next year for the making of a 1,000-ft. talking movie, under the supervision of a joint committee representing both associations and the Director of Advertising, which would be made available to member companies at a nominal cost. An appendix listed a number of situations suitable for film adaption.

Movement of the Vehicle

Enough has been done to demonstrate without question that the street car can once more resume its place and hold its own in urban traffic, according to the committee. It stated its belief that no one factor can do more to stimulate the morale of the industry and to improve public attitude toward it than the return of a common conviction by operators and the public that a modern street car is not an obsolete impediment in city traffic and that it can move aggressively with the traffic stream. While the effect of such an intangible as movement cannot be measured exactly, it exerts a powerful influence upon the general outlook of the industry, the attitude of executives, the morale of trainmen, the satisfaction of the present riders, the

appeal to the potential riders, the impression upon the general public and upon municipal administration officers.

Movement involves reduction of time between terminals, of course, but there is much more than just "so many miles per hour." For many years the statement that "the street car is the slowest vehicle on the street" has been dinned into our ears. To a large extent this still is literally true. To say that the industry has been whipped and has not been doggedly trying to absorb the blows that have come in the process of the change from a monopolistic to a keenly competitive field would be unfair and untrue. Reason has insisted that mass transportation is a vital necessity of populous communities, that the street car is the one economical mass carrier, and that stabilization and improvement would inevitably materialize. There is no denying, however, that the inability to re-equip completely with new, modern vehicles and the disheartening effects of traffic interference have had their adverse influence upon initiative and enthusiasm.

But there is now a new note. Executives, patrons, street car operators, and automobile drivers have seen street cars hold their own in the traffic stream with automobiles that were in the habit of cutting in on them at will. Many of these were new cars of new design, but among them were some of the same street cars that had in the minds of some been relegated to a position of permanent obsolescence. Car operators have felt a new encouragement when the response to their controllers made automobiles hesitate and then show signs of respect. Passengers have experienced and felt the satisfying pull of a quick, yet smooth, acceleration that has put them on even terms with automobile drivers in getting away from stops. And in many instances, so far as outward appearance goes, they were the same cars that had been in service for years.

Accomplishments so far have been relatively modest. They definitely indicate, however, what the possibilities are. Refinements to the improved equipment are needed and are being worked upon. The important thing is that a reasonably effective, tangible answer to the problem of negotiation of modern urban traffic by street cars—not only by new cars but by cars that are not new—is being daily seen and experienced.

The committee chose the following factors for their study of vehicle movement.

1. Equipment: With emphasis on street cars now in service.

2. Factors affecting movement, other than equipment, over which transportation officials have direct control.

3. Factors involving traffic interference over which electric railway transportation officials do not have direct control.

Bus Men Discuss

Legislation and Sales Promotion

Fifth Annual N.A.M.B.O. Convention held at Atlantic City gives members opportunity to inspect A.E.R.A. exhibit

CONSIDERATION of the need of securing federal regulation of interstate bus operations, ways of promoting traffic sales, the necessity of improving the safety of operation and the development of terminal facilities occupied the attention of delegates to the fifth annual convention of the National Association of Motor Bus Operators held at Atlantic City, Sept. 28 and 29. For the first time the bus meeting was held simultaneously with the A.E.R.A. convention, thus affording bus operators an opportunity to inspect the annual exhibit. Arthur M. Hill, president Blue & Gray Transit Company, and also president Charleston Interurban Railroad, Charleston, W. Va., was re-elected president of the organization, and R. T. Whiting, vice-president and general manager, Washington Motor Coach Company, Inc., Seattle, was re-elected vice-president.

An address by Senator Barkley, of Kentucky, member of the Committee on Interstate Commerce of the U. S. Senate, on the necessity and desirability of interstate bus regulation was presented at the convention. The Senator expressed the opinion that legislation should be enacted at the coming session of Congress, and that it should include provisions for the issuance of certificates of convenience and necessity and protection for carriers already furnishing satisfactory service.

The previous bill, designed to secure regulation, has failed of passage, the Senator said, due to difficulties in securing agreement on details, and not because of differences as to whether or not there should be regulation of interstate bus operations. He referred, particularly, to the amendment which was introduced at the last session which would have made it mandatory for the commission to issue duplicate certificates over the same route. In his opinion, those who have pioneered and developed a service should be protected and given the opportunity to furnish the service deemed necessary before another company is given permission to operate over the same route. Inasmuch as bus operators, railroads and their employees, State regulatory authorities, and the Interstate Commerce Commission are all urging the passage of the legislation desired, he said he could not see how Congress could long postpone passage of a suitable measure. In his opinion bus operation is as much a pub-

lic utility as water, light and gas companies and therefore just as needy of regulation for its own as well as the public's protection.

Improvements in terminal facilities were reported to be progressing steadily according to the committee studying this phase of bus operation. It was suggested that operators should devote more attention to the education of their agents to sell through transportation, establishing a particular counter for this purpose if the city is large enough to warrant it. The use of a national guide was advocated in the belief that a greater dissemination of schedule information will react in the increased sale of through tickets.

Elimination of exhaust and engine odors from the bus body was suggested by the Committee on Equipment Development, H. B. Hewitt, chairman, as of paramount importance. The increase in the ratio of horsepower per unit weight was cited as one which should mean better schedule performance. Steering ease incorporated in some of the newer vehicles would eliminate driver fatigue, it was said, and should promote greater safety of operation.

More care in advertising by the spending of money where greater value could be obtained, the employment of advertising counsel and the use of co-operative methods was reported by the Committee on Advertising, C. W. Stocks, chairman, as the principle development in this field of sales promotion.

A resolution authorizing the preparation of a bill to be presented to Congress on practically the same basis as the one previously drawn followed the Legislative Committee's report, which was presented by S. A. Markel. Another resolution put the association on record as opposed to the placing of tariffs on importations of petroleum and its products.

The contention that bus lines do not pay sufficiently for the cost of highway construction and maintenance and do not contribute sufficiently to the general cost of government should be countered by acquainting the public fully with

what the buses are now paying, in the opinion of Ivan Bowen, attorney Greyhound Lines.

How a large company educates its ticket agents and information clerks was described by J. B. Walker, Greyhound Lines. By using a series of charts, agents become acquainted with the rest of the organization and are shown what their function is in the promotion of the company's business. The importance each agent and each passenger secured bears to the company's success was carefully pointed out.

That safety in operation is a factor in the promotion of sales and in the reduction of costs was indicated by the remarks of Marcus Dow, safety director Greyhound Lines. Training of drivers, he said, must be started before the man is put to work and continued during the whole period of his employment. It is essential to keep up interest in accident reduction, and to do this the entire corps of driver supervisors must be equipped to command continued attention to the subject all the time.

Alfred Reeves, general manager of the National Automobile Chamber of Commerce, urged operators to exert every effort possible to cultivate the friendly co-operation of other highway users. He suggested carriers consider that even though they feel that they are highly taxed, the vast majority of highway costs are still being borne by the private car owners.

The second afternoon session was devoted to the presentation of *Bus Transportation's* second annual awards to those companies which had shown the greatest improvement in the efficiency and operation of their maintenance departments. Presentation of the awards was made by L. F. Stoll, publishing director of *Bus Transportation, Aviation*, and *ELECTRIC RAILWAY JOURNAL*.

Awards were made to Community Traction Company, Toledo, and Capital Traction Company, Washington, D. C., in the city classification, and to Blue & Gray Transit Company, Charleston, W. Va., and Blue Ridge Transportation Company, Hagerstown, Md., in the intercity group. Two awards for both city and intercity companies were made, depending on whether the annual mileage was more or less than 3,500,000.

The convention voted to hold the annual meetings for the years 1932 and 1933 at Chicago.



Panoramic view of the Boardwalk Pageant depicting mass transportation in its many phases

Co-ordinated Transportation *Features* Golden Anniversary Exhibit

NEVER has a more striking picture of co-ordinated transportation been presented than was portrayed by the exhibit at the 50th annual convention of the A.E.R.A. at Atlantic City, Sept. 28-Oct. 2. This year's show was the first in two years, there having been no exhibit at San Francisco in 1930. Since the 1929 exhibit, which was the first held in the auditorium, advances in products available to the transportation companies have been many. New types of cars, buses, trolley buses, electrical and mechanical equipment, track materials and accessories have been developed. The floor area covered by the exhibit this year was 80,347 sq.ft. A total of 123 exhibitors were represented.

To observers it appeared that the exhibitors this year utilized the space at their disposal to better advantage than in past years. Perhaps fewer products were shown, but the manufacturers placed greater emphasis on the latest developments. In the past two years the research of the manufacturers has brought out new designs, which while not in all instances embodying radical changes, showed marked refinement from previous models. Detailed refinements of design and production that were born of experience in the field and in the laboratory were incorporated in a large

number of the products exhibited. A touch of the historic, contrasting the old with the new, the past with the present, added considerable interest.

For the convenience of the delegates the displays were arranged in groups according to the type of products. Especially prominent was the impressive display of the Aluminum Company of America, which occupied the entire stage. Immediately in front of this was the section devoted to motor vehicles, automotive accessories and tools. The remainder of the floor was filled with railway accessories, carefully grouped, with the trackwork and maintenance-of-way exhibits occupying a section on the south side of the floor.

TRANSPORTATION PAGEANT ATTRACTIVE

Among the displays that were outstanding, judged by the interest of the visitors, might be mentioned the Boardwalk pageant of vehicles on the Convention Hall Plaza, which was arranged by the Manufacturers' Advisory Committee to commemorate the golden anniversary meeting of the American Electric Railway Association. This display brought together all of the units except a rapid transit car that might be used in a co-ordinated transportation system for a large city. It consisted of ten separate vehicles all finished in a

uniform attractive color scheme of light green and white, so that the interest would center on the vehicle itself rather than on some peculiarity of external finish. Heading the column was a high-speed interurban car of the Philadelphia & Western Railway. Following this was a large city car, then a medium-sized city car. Then came a 40-passenger trolley bus and a 30-passenger trolley bus. Four buses appeared in order of size: a 42-passenger, a 38-passenger, a 31-passenger and a 21-passenger. A taxicab brought up the rear of this column. A pleasing historic touch was added to the pageant by the display of a horse car of the vintage of 1882, by its contrast showing the tremendous strides that have been made in the mass transportation industry.

Much interest was shown in the Philadelphia & Western car, which was developed jointly by the railway and the J. G. Brill Company after more than a year's research. It embodies radical departures from standard practice. Its streamlined exterior with wedge-shaped front windows was striking. Being designed to cut down wind resistance at speeds of 80 m.p.h., it gave the impression of speed. The design carries out many of the trends of recent years. The body is all aluminum except for the body bolster and the roof carlines.

To the left of the P. & W. car was a large city-type car, one of an order for 130 built for the city of Detroit by the St. Louis Car Company representing the modern type of heavy city cars. Next in line was a double-truck medium-sized city car built for Santiago, Chile, by the J. G. Brill Company.

Following the three cars was a standard 40-passenger trolley bus built by the Twin Coach Corporation. It has the new central control design for electrical equipment, and was of the same general type as the trolley buses furnished to several systems.

Then came a Brill 30-passenger trolley bus of standard design, illustrating the smaller-sized vehicle of this class.

To the left of these vehicles were, in turn, four buses of various sizes. First was a 42-passenger bus built by Mack Trucks, Inc., for heavy service, with front entrance and rear exit. Next came a Model 54-A bus built by the White Company. It was of front-entrance, center-exit type, and seated 33 passengers. At its left was a Model Z-29 bus built by the General Motors Truck Company. It had an all-metal body, and was designed to seat 31 passengers. Fourth in the line of buses was a 21-passenger city-type vehicle of the Fargo Motor Corporation, designed for circulating load. The taxicab at the end of the line was a new model built by General Motors.

MAIN RAILWAY EXHIBIT IN AUDITORIUM

Inside the auditorium the display of street railway equipment covered a wide range. Trucks, motors and brakes were features in several of the exhibits.

Of three types of trucks exhibited, two were built for worm drive. The J. G. Brill Company showed its new 90-E truck, in which the drive, with a 7.1 to 1 reduction, consists of a hardened-steel worm meshing with a bronze worm wheel pressed directly on the axle.

The No. 52-C truck recently brought out by the Timken-Detroit Axle Company for city service was the feature of this manufacturer's display. This truck differs from the company's previous model, the 52-B, in having bronze journals and solid axle shafts. The worm gear set is of the underslung type with three-bearing worm shaft mounting. Automotive leaf springs carry the frame and motors and serve to maintain the axles in proper relation to each other.

Of interest in the car truck built for the Indiana Railroad and shown by the General Steel Castings Corporation was the inclusion in a single unit of the wheel piece members—transom, pedestals, motor support brackets and incidental brackets for hanging clasp brakes.

Motors covering the entire traction field were displayed by the General Electric Company. In addition, some old motor equipments were shown to

illustrate the many improvements that have been made during the last 30 years. The modern equipment included a 35-hp., 600-volt motor, designed for high accelerating rates, and weighing complete 1,500 lb. Another unit of recent design was the GE-1154, 600-volt, 50-hp. motor of high-speed design for trolley bus and street car service. It weighs complete 785 lb. Equipment for the modern gas-electric bus comprised a DT-1121 generator suitable either for single or double-motor drive and a GE-1151 motor used for double-motor drive. The latter unit weighs complete 510 lb. In the trolley bus field there was shown a Type PCM control unit designed for handling two 50-hp. motors, and a 10-ft. light-weight air compressor.

The Westinghouse Electric & Manufacturing Company's motor exhibit included seven types. The largest of these was the 190-hp., 600-volt motor built for the 300 cars to be operated in the New York City subway. This motor weighs complete 5,300 lb. Other displays showed the Type 511, 35-hp., 600-volt motor, with single-reduction gear, designed for 26-in. wheels in city service, and the Type 510-E, 35-hp., 600-volt motor, designed for 26-in. wheels, of which there are about 9,000 in service. Motors for trolley bus service included the Type 1426, 50-hp., 600-volt, high-speed motor weighing 830 lb., and the Type 1427, 35-hp., 600-volt, motor, weighing 630 lb. The Type VA trolley bus control equipment with foot-operated master controller was exhibited on a rack, with complete control apparatus for rear mounting. Other control equipment was the Type VA car control and the Type XM-39 recently ordered by the Chicago Surface Lines. Renewal parts were grouped by related lines. This display included complete field shunting equipment, motor parts, and electro-pneumatic valves.

Several attractive displays were devoted to brakes, bearings and gears for electric cars. In this group the Westinghouse Traction Brake Company featured the new self-lapping brake valve.

A traction booster, designed to afford greater retarding force to the car by means of magnetic shoes pulling the truck frame toward the rails to shorten the stopping distance, was also displayed. The Safety Car Devices Company had a complete operating model with air brakes and control equipment using the new type of self-lapping brake valve for hand and foot operation.

In this line of equipment, the National Brake Company displayed a Peacock 1250 brake, an improvement over the No. 440 brake, in use largely in the equipment of electric locomotives. It was displayed as the highest-powered hand brake on the market.

The American Brake Shoe & Foundry Company exhibited its A.E.R.E.A.

standard patterns of steel-backed brake shoes, and malleable-iron brake heads and keys. Clasp brake equipment, as used on multiple-unit high-speed trucks, and miscellaneous steel castings used in street railway work, were shown by the American Steel Foundries.

The Chillingworth Manufacturing Company exhibited a variety of gear cases; typifying modern construction and design, for both Westinghouse and General Electric motors. This company also showed for the first time a gear case which was treated with a compound to silence the noise caused by the gear and pinion.

To those historically minded the exhibit of the Tool Steel Gear & Pinion Company, showing the evolution of the Tool Steel gear in 25 years, was of special interest. In the line of more modern equipment this company showed a high-reduction unit for high-speed motors and a lead-quieted gear.

Of chief interest in the exhibit of the Johns-Manville Corporation was the full-size section of a street car insulated in the floor, walls and roof with Salamander car insulation. The ceiling of this car was treated with J-M acoustical correction. This system of sound and heat insulation and the acoustical correction have been installed in many passenger cars of steam and electric railways. For buses, the Johns-Manville Corporation displayed a complete line of friction material, which included the new molded and compressed lining for heavy mechanical brakes.

Evidence of the increasing use of roller bearings in cars was indicated by the exhibits of the Timken Roller Bearing Company and the Hyatt Roller Bearing Company. Both companies showed a complete line of roller bearings for cars. In addition, Hyatt displayed a roller bearing journal box.

Principal forms of aluminum used in railway construction were shown by the Aluminum Company of America, which included structural shapes; spun, die and permanent mold castings; forgings; fabricated sheet, plate and molding; cable and busbar; tubing and conduits. Several finishes for aluminum were also displayed. One of the items of great interest to railway men was a thin-wall conduit which weighs less than one-half as much as steel conduit. Another railway item was the stator frame for the Reading traction motor, said to be the largest railway motor frame casting of aluminum alloy.

The DuPont Company exhibited a large number of panels of different Dulux colors, its new type of finish for electric cars and buses. These panels were exposed alongside of paint, varnish and enamel finishes of the regular type to indicate improvements in durability. These displays were planned to

show a better retention of gloss, greater resistance to fading, elimination of failure by checking and cracking. The serviceability claimed for Dulux finishes is due principally to a new synthetic vehicle in the product.

Samples of Haskelite, Plymetl, flat Haskelite panels as used for bus floors, card racks and seats featured the display of the Haskelite Manufacturing Corporation.

CAR AND BUS ACCESSORIES HAVE LARGE SECTION

Displays of car and bus accessories took up a large portion of space in the convention hall. The general arrangement and attractive appearance of these exhibits fitted in well with the larger ones to create a noticeably superior appearance of this year's show. In this line of exhibits were many types of seats and seating material, door engines and door-control systems, heaters, turnstiles, registers, and other equipment. Noticeable among this class of exhibit were the great improvements made in door-operating mechanisms.

The National Pneumatic Company arranged effectively full-size working models of its latest door-operating systems in several table displays which included systems with vacuum door engines and pneumatic engines. Entrance to this booth was made through a treadle-operated door. The full-size models included a newly developed treadle-operated sensitive-edge door for buses. Among other doors with safety features were one model with a reversing door engine for buses, and a folding double door for electric cars with a selective door engine operating at constant speed. The general arrangement of this booth, and the display of old door engines made it very attractive.

Just across the aisle the Consolidated Car Heating Company showed its pneumatic door equipment and several types of heaters and heater controls. The special new offering here was a blast heaters with a silent blower in which the current to the heating element is automatically cut off when the motor is stopped. Other items were an improved thermostatic control, electric heater for cars and buses, a steam heater for buses and a safety switch panel for trolley buses.

The Gold Car Heating & Lighting Company featured three types of heating elements—open coil, low-voltage and high-voltage inclosed elements. The Electric Service Supplies Company had a complete line of Keystone car and bus equipment. Special attention was given to a working model of the Mueller-Evans bus heating and ventilating system, and a new ventilator.

Together with many of its standard products the Economy Electric Devices Company displayed the Superior trolley slide for city and interurban cars, and

a new lubricating paste for trolley wire. Railway Utility Company showed Chromalox strip heaters, heat regulators, ventilators and ground detectors.

The Johnson Fare Box Company displayed the new type of fare collection designed exclusively for the Twin Coach Company and installed in the Taxicoach. Other products of this company were an electrically operated fare box equipment, which had an instantaneous overhead registration, a Johnson "Universal Changer," and the Type D hand-operated registering fare box.

Several types of recording instruments and registers were displayed by the Ohmer Fare Register Company. These included the Vibracorder, which produces a complete seven-day record of the movement of any motor vehicle, and the Tachograf which records the running time and idle time, and also records the exact speed at which the bus was operated at any time. Other displays were a full line of Ohmer fare registers and ticket-printing registers.

The Perey Manufacturing Company featured in its exhibit the Coinpassor, a coin-controlled turnstile of the type installed on many of the Brooklyn Bus Corporation's buses. Several other types of turnstiles for street cars and for subway and elevated systems were also on display.

Latest developments in transfers designed primarily for use on one-man cars, and a complete line of samples covering all kinds of tickets in strips and bulk were shown by the Globe Ticket Company, along with ticket printing machines.

An extensive line of car seats and seating material may be cited as an example of the contribution of accessories manufacturers in improving the appearance and comfort of the transportation unit. Among special offerings of these exhibits were the reclining and semi-reclining models by Hale & Kilburn, reclining seats with aluminum alloy frames by S. Karpen & Brothers, and another very light seat with a magnesium alloy frame by the Kelton-Aurand Manufacturing Company. Other exhibitors of seats were the Art Rattan Works and Heywood-Wakefield.

Besides non-inflammable material for seats and curtains the Pantasote Company had something new in insulating headlining and wainscoting. Upholstered fabrics of the L. C. Chase Company comprised Velmo, mohair velvet, Leatherwove and other grades.

Upholstering leathers of all types were displayed by the General Leather Company. These included standard leathers as well as the new chrome leather known as Velvalea and Transitan.

Porcelain-enameled stanchions, grab rails and seat handles in white and various colors were shown by the Ellcon Company. This exhibit included Ellcon fittings, special interior trim, chromium-plated and stainless steel.

The O. M. Edwards Company displayed quickly removable sash for street car and bus service, and similar sash in the drop type for the de luxe buses.

The Tuco Products Corporation showed Tucolith for car and bus flooring. In addition, roofing materials, and rockwool insulation, a light-weight fire-proof insulator with high sound-deadening qualities, were also on display.

BUS EXHIBITS IMPRESSIVE

Manufacturers of buses did a splendid job in their exhibits this year. The display of buses was felt by those who saw it to be undoubtedly the most impressive that has been held at any time, anywhere. It showed the most comprehensive selection of motor vehicles for the transportation industry, and forcefully brought home the fact that the design and production of the bus has reached a far higher plane than was evident at any previous exhibit. Many important trends in the design of the bus were noticeable.

It was apparent that manufacturers have paid a great deal of attention to body design and general harmony of appearance. Developments in body design in practically all types of buses for urban service have been made with a view to minimizing the time for loading and unloading of passengers. Wide doors and low step heights were in evidence. There was a noticeable trend toward the street car type of body and to the use of the center and off-center exit doors. Remarkable attractiveness of body appearance has been obtained by the greater use of streamline designs. Also significant is the emphasis that has been placed on the general reduction in weight per passenger. The use of all-steel bodies and the light alloys have brought about a general reduction in weight of practically all models. This trend, together with the development of more powerful engines, resulting in a higher ratio of horsepower to weight, is making practicable a steady increase in the capacity of buses.

This important tendency toward larger and larger capacity buses was accompanied by increasing attention to efficient and economical small-capacity units for light feeder lines and small properties. Several of these small-capacity buses were displayed, attracting the attention of many operators.

The street car type, 43-passenger bus was displayed as the latest addition to the Mack line. It is powered by a single 110-hp., six-cylinder engine and incorporates for the first time a Vickers hydraulic booster for power steering. This model has a 46-in. center-exit door and a front-entrance door of the same width. Mack also exhibited a 17-21-passenger light six. Besides the bus models, Mack had an interesting display of parts and running assemblies. A model of the hydraulic steering gear booster was shown in actual operation.

Much of the interest in the large exhibit of the General Motors Truck Company centered in a new 40-passenger all-metal bus, equipped with an engine of 150 hp. Considerable reduction in weight for this capacity has been obtained by the extensive use of aluminum alloys for the body members and frame sections. Departure from designs of Yellow buses was made in this model by the adoption of the street car type of body with an off-center exit door and the rear mounting of the engine. The engine is removable as a unit with the rear axle center. A new type of steering mechanism, used in this model for the first time, facilitates the handling of this large vehicle. Essentially, it consists of a worm sector pivoted on the axle with the shortest possible steering links to the steering arms. Seven other bus models, one of which was on the plaza, were displayed by General Motors, ranging in size from a 21-passenger parlor type to the 40-passenger bus just described.

SMALL BUSES ALSO SHOWN

One of the interesting displays in the low-capacity field was the Twin Coach Model 15, seating seventeen passengers. This is today the smallest capacity vehicle built by Twin Coach. It features a self-operating automatic clutch. This model might best be described as a miniature Twin Coach with a single engine. Twin Coach also showed a 40-passenger dual motor bus, similar to those purchased by the Brooklyn Bus Corporation, having a Perey turnstile for fare collection. The Taxi-Coach, in both urban and interurban types attracted considerable attention.

A newly developed center-exit bus and a new six-cylinder engine designed for special types of service featured the display of the White Company. Six buses, ranging in capacity from 20 to 40 passengers and a newly designed power repair truck comprised this company's exhibit. The new center-exit bus has a seating capacity of 33 passengers and the center door is treadle operated. The new engine, shown for the first time, is of the six-cylinder overhead type similar to the standard series of engines of the company. All models displayed were mounted on the new White-Bender steel underbody, developed to give rigidity and to protect against road twisting.

Together with the 40-passenger all-steel model, the American Car & Foundry Motors Company exhibited several parlor car and city types of buses. A large highway express tractor truck and the 175-hp. Hall-Scott engine were also on display. The 40-passenger bus has a front-entrance door just back of the front wheelhousing and an exit door at the rear, air-operated with electric control. This model is powered by a 120-hp. Hall-Scott engine.

Fargo Motor Corporation exhibited a 33-passenger street car type bus and two 21-passenger buses, one of the parlor car type and the other of the city type. A 29-passenger parlor-car type was also displayed. The 33-passenger all-metal bus was designed for circulating loads. It weighs 12,010 lb. complete on the road, or 364 lb. per passenger capacity. It is powered by a straight eight. All Fargo models featured low weight per passenger capacity.

Studebaker with a 25-passenger street car type bus and a chassis, and the Reo Motor Car Company made up the remaining bus exhibits. Reo exhibited a 21-25 passenger bus chassis of new design, a 25-passenger pay-enter city type bus, and a 21-passenger reclining seat bus with inside luggage rack. The new chassis is powered with a 101-hp. six-cylinder engine and has chrome-nickel cylinder blocks.

Displays of bus bodies were made by the Bender Body Company and the Wiener Body Company. Bender showed two skeleton city pay-enter bodies, one of composite construction and the other all metal. This unfinished display was made to illustrate the steel under-structure and the iron framing. The Wiener Body Company showed a 25-passenger body on a Model 54 White chassis and a 32-passenger semi-de luxe observation body on a Model 65-A White chassis. This company also had a collection of historical photographs showing advancement in bus body design since the early days of the industry.

Hercules Motors Corporation showed a series of six and four-cylinder engines completely equipped, and a complete line of Hercules parts. The Sterling Engine Company exhibited the Sterling Petrel bus and truck engine, rated at 150 hp. at 700 r.p.m. Also on display was the Sterling Viking eight-cylinder rail-car engine, the largest and most powerful engine of its type built.

In the line of bus accessories, many very interesting displays were made. Among these may be mentioned the display of automotive air brakes for buses and heavy-duty commercial vehicles by the Bendix Brake Company, together with air horns, signals and other air-operated accessories.

The Leece-Neville Company showed a complete line of automotive electrical equipment which included voltage-regulated electric generating systems used on present-day buses, comprising generators of various capacities and their respective control units. One system was on demonstration to show some of its many distinctive features.

A carburetor and spark adjusting machine, marketed under the name Casam, was the principal display of the Cities Service Company, which also included various grades of lubricating oils and greases. This machine was shown in the portable and stationary models. It detects and measures the

unburnt gases emerging from the exhaust line by picking up a sample of the exhaust gas and burning it to record the heat generated in terms of per cent of complete combustion.

A new development in a fuel supply system made its first appearance in the display of S.B.U. Pumps, Inc. It consisted of a gasoline pump, direct connected to a vapor and splashproof electric motor operated with battery current, and of automatic pressure and volume control valves built into the pump.

LATEST IN TROLLEY BUSES

Of interest to trolley bus operators were the displays of this type of vehicle on the Boardwalk and in the convention hall, and also the displays of overhead material by the Ohio Brass Company and the Westinghouse Electric & Manufacturing Company. Altogether, five trolley buses were exhibited. In addition to the two on the Plaza three trolley buses were on display in the auditorium.

Distinctive features of the new Yellow Coach 44-passenger trolley bus are the extensive use of aluminum alloys and the rear mounting of the motors. In addition, this model has a new centralized under-body control system, light alloy trolley poles, and a full blower system of ventilating all controllers, motors, compressors, etc.

The Brill trolley bus of 40-passenger capacity has a total weight of 18,260 lb. Its underframe and superstructure are of integral steel construction, and the underframe center sills, corresponding to automotive chassis framing, are deep channel steel pressings extending the full length of the vehicle. The body is spring mounted on Timken axles developed specially for trolley bus use. The motive power consists of two 50-hp. motors with a double worm gearing housed in the double-bowl rear axle. Each motor drives one wheel through its own propeller shaft and gearing.

The 40-passenger trolley bus built for the Memphis Street Railway by the St. Louis Car Company is equipped with two 50-hp. motors, air brake, pneumatically operated doors, with a treadle at the rear exit.

Together with the standard overhead equipment for electric car service, the Ohio Brass Company displayed a new improved line of overhead materials and equipment for trolley bus service. These included a new light-weight trolley bus base with a touring range indicator and overhead material for special work.

Westinghouse equipment for trolley bus overhead included an electrically operated frog, a molded feeder insulator, a ball-and-socket hanger, and the latest design of light-weight trolley base of welded structural steel shapes.

C. I. Earll showed a retriever designed especially for trolley bus service. Trolley bus equipment displayed by the General Electric Company in-

cluded a PCM control unit designed for handling two 50-hp. motors, a 10-ft. light-weight air compressor and a new pneumatic lap brake equipment.

TRACK DISPLAYS MANY

Among the new developments of the manufacturers of rails and special work was a new type of track construction jointly displayed by the Carnegie Steel Company and the Illinois Steel Company. The new GEO type of track, recently developed in Germany, differs from that generally used in America in the design of tie plate, method of fastening it to the tie and to the rail, and the use of a treated and compressed wood shim with each plate. These companies also exhibited a pair of rim-toughened wrought-steel wheels on short sections of steel cross-tie track.

Besides the Dardelet thread-lock bolts and nuts, the Bethlehem Steel Company also displayed frogs, mates and crossings of silico-manganese steel together with standard products such as a solid manganese switch and steel ties.

Another historical display was that of the Lorain Steel Company in which models of street railway trackwork which manufacturers were called on to make during the early development of the industry were exhibited, together with rails, switches, frogs and other trackwork of modern design. The Buda Company and the William Wharton Company showed their standard products in switches, mates and frogs. In addition, the Wharton Company showed frogs reconditioned by welding with Timang rods.

Instruments used in recording tread and flange contours of wheels in service, and various sizes of Naco spun-steel

car wheels were in the display of the National Malleable & Steel Castings Company.

Demonstration by the International Steel Tie Company of the "mortar flow" methods of placing concrete around all types of paved track with high-frequency vibration attracted many of the way engineers. To point out the results of this method of placing concrete, a section of paved track construction was cut away to show the Twin tie, and to show the bond between the steel and concrete. A new vibratory type screed for finishing concrete track paving and setting concrete in all types of construction was shown.

A layout to show the method of thermit-welding rail joints under traffic was the chief display of the Metal & Thermit Corporation. Rail-welding preheaters and rail clamps of the latest design and other improved apparatus for thermit welding were also included in this exhibit.

Several types of rail grinders were shown in operation by the Railway Track-Work Company. These included an improved high-speed rail grinder, the "Vulcan" rail joint grinder and the "Eureka" radial rail grinder. In addition this company showed an "Ajax" electric arc welder, "Ajax" trolley wire and several grades of grinding wheels and bricks.

Complete lines of rail bonds were displayed by the American Steel & Wire Company and the Electric Railway Improvement Company. In this class of equipment the Rail Joint Company showed base-supported continuous joints and reinforced joints adapted to the latest methods of welding. Seam welded rail joints were displayed by the Una

Welding & Bonding Company. In addition to the complete line of rail bonds, the Electric Railway Improvement Company showed auxiliary welding equipment and parts.

Transmission and distribution wire material for electric railway and trolley bus operation were the chief displays of the Bridgeport Brass Company. Included with these were samples of fittings of "Phono" and "Duronze" alloys as well as samples of copper-ground rods. The latter item is a new product by this company.

In the display of the Anaconda Wire & Cable Company, a specially designed catenary system with Hitenso trolley wire for the Pennsylvania Railroad and sections for other electrified railroads were featured. Non-ferrous Anaconda wire, cable and accessories were also shown. These items are designed to eliminate trouble caused by rust and vibration. Other displays of wire and cables were those of the American Steel & Wire Company and the Okonite-Callender Cable Company. The latter company displayed various types of impregnated paper cables, including Okonite-Callender super-tension cables and their joining accessories.

Ornamental fluted steel poles and the monotube strain and distribution poles, pole fittings and street lighting equipment were displayed by the Union Metal Manufacturing Company. The monotube poles are of cold-rolled open-hearth steel, making one-piece continuously tapered tubular poles, without horizontal joints.

Automatic block signals for interurbans and subways were featured by the Nachod and United States Signal Company.



An attractive transportation display once again filled Atlantic's City huge auditorium

Trend of REVENUES and EXPENSES

	Operating Revenue \$	Increase or Decrease Per Cent*	Operating Expenses and Taxes \$	Increase or Decrease Per Cent*	Net Income \$*	Increase or Decrease Per Cent*		Operating Revenue \$	Increase or Decrease Per Cent*	Operating Expenses and Taxes \$	Increase or Decrease Per Cent*	Net Income \$*	Increase or Decrease Per Cent*	
Boston Elevated Railway, Boston, Mass.								Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.						
Aug., 1930....	2,280,322	7.81	2,113,183	1.55	274,728	163.79	Aug., 1930....	64,592	18.82	62,484	8.19	12,690	36.45	
Sept.....	2,470,918	3.78	2,091,718	0.52	69,868	200.31	Sept.....	72,267	11.61	63,549	6.42	8,497	436.09	
Oct.....	2,811,399	4.04	2,157,474	1.89	221,188	31.30	Oct.....	75,708	17.80	66,353	0.69	18,447	226.80	
Nov.....	2,579,899	10.34	2,066,206	2.66	71,150	77.85	Nov.....	72,024	13.82	66,314	0.23	21,171	158.25	
Dec.....	2,850,330	8.20	2,178,896	2.24	235,950	56.62	Dec.....	79,764	15.78	67,438	7.33	13,133	236.77	
Jan., 1931....	2,840,159	8.43	2,082,456	6.23	314,067	30.56	Jan., 1931....	74,018	13.38	62,239	7.93	13,594	76.36	
Feb.....	2,534,828	8.33	1,952,032	6.23	142,339	48.27	Feb.....	75,201	7.83	64,051	7.61	15,965	5.28	
Mar.....	2,769,564	7.30	2,019,081	4.92	309,212	29.03	Mar.....	70,660	0.48	62,685	4.90	16,298	23.64	
Apr.....	2,616,188	7.00	1,909,176	7.93	275,740	11.45	Apr.....	72,560	8.29	61,040	6.82	15,996	21.34	
May.....	2,579,265	8.70	1,993,753	4.86	143,804	62.47	May.....	63,338	13.81	59,346	9.15	24,700	97.48	
June.....	2,415,179	6.32	2,073,560	7.04	99,815	169.79	June.....	58,406	4.11	59,429	7.33	20,259	16.34	
July.....	2,188,942	7.68	2,021,305	4.12	271,777	62.23	July.....	61,749	4.40	57,896	7.34	7,823	46.23	
Aug.....	2,098,072	7.99	1,948,492	7.79	344,901	25.50	Aug.....							
Brooklyn-Manhattan Transit System, New York, N. Y.								Galveston-Houston Electric Railway, Houston, Tex.						
Aug., 1930....	4,727,623	4.39	3,558,841	6.64	465,144	14.91	Aug., 1930....	47,425	11.42	28,402	8.12	82,156	146.25	
Sept.....	4,834,251	2.49	3,453,431	4.52	667,323	6.20	Sept.....	42,823	16.49	28,052	14.83	84,893	144.43	
Oct.....	5,036,775	2.58	3,572,553	4.22	758,817	2.78	Oct.....	38,032	11.56	27,266	6.85	93,685	127.12	
Nov.....	4,769,083	4.37	3,366,923	6.98	689,470	2.34	Nov.....	36,974	12.49	44,183	9.58	93,343	112.93	
Dec.....	5,065,484	2.56	3,546,963	4.25	814,788	2.04	Dec.....	36,166	15.00	27,949	1.79	105,000	110.69	
Jan., 1931....	4,852,706	5.48	3,475,330	7.01	674,029	5.80	Jan., 1931....	33,291	20.15	25,057	9.18	111,369	110.17	
Feb.....	4,453,655	3.79	3,159,903	5.95	583,468	2.40	Feb.....	32,281	19.80	22,990	9.64	114,559	93.49	
Mar.....	5,028,562	2.56	3,475,847	3.37	814,360	4.13	Mar.....	32,904	22.38	24,732	14.69	117,394	189.69	
Apr.....	4,969,481	2.09	3,458,940	3.35	804,235	0.25	Apr.....	34,729	16.98	24,132	11.98	116,770	57.67	
May.....	5,056,779	3.31	3,438,037	4.51	913,877	1.62	May.....	39,889	12.68	24,992	11.61	116,819	49.64	
June.....	4,983,112	1.71	3,466,384	3.49	870,919	12.12	June.....	41,484	11.27	25,961	11.24	116,819	49.64	
July.....	4,841,635	3.24	3,499,609	3.02	631,791	7.21	July.....							
Aug.....	4,582,572	3.27	3,419,932	3.90	423,123	9.03	Aug.....							
Brooklyn & Queens Transit System, New York, N. Y.								Houston Electric Company, Houston, Tex.						
Aug., 1930....	1,827,238	6.45	1,595,256	7.11	120,864	8.15	Aug., 1930....	244,033	12.41	177,452	10.89	573,872	4.18	
Sept.....	1,887,499	4.66	1,564,271	5.65	213,728	2.66	Sept.....	251,919	9.00	175,905	10.42	571,857	5.84	
Oct.....	1,922,388	5.60	1,597,166	5.60	214,924	7.74	Oct.....	267,306	7.67	181,499	10.67	573,425	4.16	
Nov.....	1,820,498	5.65	1,522,735	7.58	187,822	5.20	Nov.....	247,210	10.00	176,739	1.96	550,635	9.58	
Dec.....	1,920,463	4.40	1,560,950	6.11	250,893	6.06	Dec.....	258,219	9.84	180,678	0.63	524,458	16.64	
Jan., 1931....	1,849,644	3.18	1,541,235	7.58	197,355	3.02	Jan., 1931....	242,554	10.62	176,792	11.08	518,843	17.70	
Feb.....	1,704,677	6.98	1,416,192	5.40	176,217	2.58	Feb.....	225,256	14.11	163,249	12.96	507,328	20.19	
Mar.....	1,941,078	1.98	1,602,862	2.58	227,472	1.21	Mar.....	244,396	10.97	170,067	12.70	502,405	19.39	
Apr.....	1,911,878	1.29	1,592,919	3.11	208,514	6.86	Apr.....							
May.....	1,980,118	2.50	1,585,293	1.85	286,334	7.89	May.....	222,528	10.09	159,897	10.71	507,530	13.86	
June.....	1,942,830	1.29	1,609,335	0.34	221,493	13.98	June.....	214,241	13.29	158,175	10.50	404,721	30.72	
July.....	1,893,414	1.24	1,550,897	3.34	227,012	11.59	July.....							
Aug.....	1,849,792	1.23	1,574,167	1.32	142,667	17.54	Aug.....							
Capital Traction Company, Washington, D. C.								Hudson & Manhattan Railroad, New York, N. Y.						
Aug., 1930....	314,513	3.48	268,561	4.09	16,103	2.62	Aug., 1930....	934,204	6.65	499,806	5.98	98,977	26.27	
Sept.....	327,713	7.06	268,066	1.61	30,259	6.78	Sept.....	974,433	2.80	506,845	0.23	132,332	18.68	
Oct.....	374,646	1.22	288,351	1.48	58,638	17.56	Oct.....	1,033,584	4.33	521,325	1.97	176,999	17.70	
Nov.....	346,054	2.70	273,481	1.64	42,659	11.05	Nov.....	994,735	6.18	489,761	4.08	169,465	21.42	
Dec.....	369,885	1.77	274,221	3.21	67,651	0.61	Dec.....	1,060,614	4.66	497,109	17.40	306,321	12.49	
Jan., 1931....	347,491	3.06	280,514	3.30	37,705	5.11	Jan., 1931....	1,005,022	7.62	512,350	7.23	157,098	21.78	
Feb.....	312,815	3.47	252,080	5.68	30,521	1.87	Feb.....	936,542	6.67	467,137	6.09	134,717	16.34	
Mar.....	344,191	2.65	270,962	3.26	43,847	4.03	Mar.....	1,013,577	6.05	497,695	5.34	180,554	15.13	
Apr.....	366,276	2.39	273,436	5.89	65,123	12.93	Apr.....	1,002,265	5.78	485,938	5.73	181,182	15.09	
May.....	362,502	1.87	281,344	1.61	50,959	6.60	May.....	974,737	6.24	481,504	6.63	158,191	18.77	
June.....	351,017	3.05	276,751	1.84	45,841	12.14	June.....	941,598	4.82	477,392	4.41	128,896	16.23	
July.....	306,826	0.10	258,341	1.52	9,438	91.25	July.....	897,211	6.00	470,918	6.28	91,288	21.80	
Aug.....	264,135	16.02	251,657	6.29	17,408	208.00	Aug.....	875,376	6.29	463,292	7.31	77,020	22.18	
Chicago Surface Lines, Chicago, Ill.								Illinois Terminal Company, Springfield, Ill.						
Aug., 1930....	4,488,146	12.20	3,796,705	8.06	680,219	15.82	Aug., 1930....	661,520	7.65	466,816	12.07	152,827	12.15	
Sept.....	4,568,564	9.50	3,789,472	4.40	713,323	12.94	Sept.....	654,477	5.26	454,818	9.66	160,897	14.62	
Oct.....	4,879,570	10.79	3,933,416	7.35	799,118	11.69	Oct.....	691,672	2.54	503,107	2.41	148,701	11.61	
Nov.....	4,537,647	13.48	3,769,538	6.26	712,177	20.77	Nov.....	542,672	11.02	430,907	6.24	80,529	23.11	
Dec.....	4,846,000	8.09	3,984,572	9.89	767,348	10.67	Dec.....	577,425	13.69	427,987	14.25	127,588	5.66	
Jan., 1931....	4,576,133	12.65	3,825,964	6.37	718,129	21.00	Jan., 1931....	509,641	20.77	395,953	13.80	87,742	9.23	
Feb.....	4,234,704	10.60	3,665,038	6.04	601,726	15.44	Feb.....	498,067	6.89	398,126	5.81	84,381	2.26	
Mar.....	4,584,224	4.36	4,287,237	5.34	557,167	15.05	Mar.....	568,653	1.95	398,855	6.94	143,325	28.98	
Apr.....	4,759,624	4.46	4,092,047	0.36	675,629	11.66	Apr.....	547,992	7.17	395,315	6.46	127,179	3.24	
May.....	4,541,847	9.38	3,802,582	4.61	724,514	12.88	May.....	581,953	4.34	389,538	8.87	162,905	13.83	
June.....	4,348,896	8.76	3,629,943	5.38	664,122	14.51	June.....	581,093	1.68	398,980	15.29	154,417	90.05	
July.....	4,093,702	9.74	3,579,566	6.98	580,118	10.55	July.....	550,906	8.41	395,741	16.33	123,420	40.89	
Aug.....	4,018,958	10.46	3,502,795	7.74	589,056	10.34	Aug.....	597,050	9.76					
Department of Street Railways, Detroit, Mich.								Interborough Rapid Transit Company, New York, N. Y.						
Aug., 1930....	1,516,209	29.02	1,426,941	16.67	52,773	119.46	Aug., 1930....	5,183,166	4.59	4,121,083	5.06	763,482	172.17	
Sept.....	1,510,161	26.36	1,436,175	12.59	61,711	115.40	Sept.....	5,684,267	0.17	3,983,368	7.78	131,270	206.22	
Oct.....	1,579,476	25.84	1,458,238	14.91	22,933	91.71	Oct.....	6,315,679	1.13	4,162,660	0.83	161,417	207.14	
Nov.....	1,481,136	23.35	1,333,571	13.38	4,900	98.14	Nov.....	5,965,365	4.96	3,869,340	0.00	272,021	121.79	
Dec.....	1,610,179	22.69	1,440,303	21.67	23,052	77.93	Dec.....	6,477,864	0.62	4,194,315	3.96	293,152	47.40	
Jan., 1931....	1,550,656	28.54	1,421,575	20.95	12,759	91.44	Jan., 1931....	6,123,645	4.42	4,238,833	10.83	348,972	65.92	
Feb.....	1,431,468	25.58	1,323,683	18.96	38,309	117.94	Feb.....	5,570,354						

Trend of Revenues and Expenses by Months (Concluded)

	Operating Revenue \$	Increase or Decrease Per Cent*	Operating Expenses and Taxes \$	Increase or Decrease Per Cent*	Net Income \$†	Increase or Decrease Per Cent*							
							Operating Revenue \$	Increase or Decrease Per Cent*	Operating Expenses and Taxes \$	Increase or Decrease Per Cent*	Net Income \$†	Increase or Decrease Per Cent*	
Kansas City Public Service Company, Kansas City, Mo.							United Electric Railways, Providence, R. I.						
Aug., 1930....	622,554	13.17	530,094	11.41	15,479	64.11	Aug., 1930....	495,723	442,076	3,643
Sept.....	650,114	9.99	524,324	12.12	50,261	1.32	Sept.....	493,296	12.72	434,036	10.39	8,276	72.01
Oct.....	725,428	4.89	700,311	12.90	60,435	190.35	Oct.....	531,803	13.76	41,223	63.80
Nov.....	706,577	5.29	572,066	7.04	58,994	6.69	Nov.....	506,318	14.58	439,930	12.83	16,958	64.37
Dec.....	758,045	1.73	570,065	14.58	108,444	284.88	Dec.....	559,363	13.02	460,420	21.92	51,623	89.51
Jan., 1931....	711,215	6.52	577,741	12.67	61,108	137.10	Jan., 1931....	543,940	13.39	493,596	12.94	372	95.68
Feb.....	640,676	6.87	537,583	9.72	27,392	149.06	Feb.....	482,566	14.30	437,444	13.02	4,503	150.71
Mar.....	216,637	2.58	577,319	7.25	66,013	72.81	Mar.....	524,299	10.44	480,958	9.38	6,235	265.73
Apr.....	709,515	0.68	565,328	6.23	71,298	99.32	Apr.....	510,645	9.39	470,964	7.60	9,992	456.60
May.....	701,286	2.37	562,482	7.66	64,474	114.33	May.....	509,278	10.64	474,803	7.52	15,021	168.13
June.....	655,957	0.17	540,187	6.23	42,677	683.20	June.....	482,703	9.40	438,362	8.15	4,633	201.09
July.....	613,628	3.19	533,084	9.23	6,643	119.18	July.....	462,601	10.21	436,574	4.84	22,069	502.72
Aug.....	600,311	3.57	518,559	2.18	6,122	247.05	Aug.....	445,932	10.15	420,929	4.78	23,467	744.17
Long Island Railroad, New York, N. Y.							United Railways & Electric Company, Baltimore, Md.						
Aug., 1930....	3,968,936	6.21	2,635,376	5.06	1,152,651	6.69	Aug., 1930....	1,198,180	8.34	831,241	18.41	6,119	71.42
Sept.....	3,589,671	7.35	2,467,056	7.07	928,655	6.68	Sept.....	1,261,734	6.71	995,805	6.02	10,050	75.81
Oct.....	3,371,761	6.80	2,446,346	8.97	729,067	1.77	Oct.....	1,354,086	7.28	1,049,306	4.84	25,163	71.16
Nov.....	2,954,624	4.20	2,249,258	14.66	483,180	89.15	Nov.....	1,263,811	10.26	983,047	7.40	9,200	87.30
Dec.....	2,905,045	6.60	2,130,182	16.27	596,812	47.11	Dec.....	1,350,553	8.19	1,043,315	7.25	36,700	64.64
Jan., 1931....	2,763,421	6.65	2,210,263	9.65	321,141	6.00	Jan., 1931....	1,268,536	10.90	994,411	11.89	7,388	69.22
Feb.....	2,561,169	7.43	2,074,216	9.13	332,002	3.88	Feb.....	1,136,604	15.78	891,421	16.97	24,088	231.15
Mar.....	2,841,915	3.09	2,234,418	9.00	449,501	24.64	Mar.....	1,262,429	14.90	981,026	14.76	12,212	84.94
Apr.....	2,976,402	4.69	2,269,029	7.37	533,425	1.97	Apr.....	1,253,764	13.60	966,424	13.66	11,440	82.93
May.....	3,212,765	4.00	2,338,313	8.03	695,032	9.93	May.....	1,256,334	13.78	991,107	11.93	2,206	96.99
June.....	3,414,354	6.78	2,351,016	7.26	907,010	6.76	June.....	1,195,126	10.29	963,857	7.59	34,952	198.96
July.....	3,629,561	9.89	2,594,463	2.75	783,315	32.75	July.....	1,105,980	10.55	946,646	1.86	117,591	918.99
Aug.....	3,513,473	11.48	Aug.....	1,038,314	13.34	947,614	1.76	180,963	3,057.40
Market Street Railway, San Francisco, Cal.							British Columbia Electric Railway, Vancouver, B. C.						
Aug., 1930....	720,284	6.69	643,287	5.48	72,923	16.56	June, 1931....	1,095,355	773,689a	.....	321,666	.....
Sept.....	745,298	6.35	626,770	3.74	64,731	16.38	July, 1930....	1,171,585	900,425a	.....	271,160	.....
Oct.....	786,012	6.73	675,908	6.49	57,384	45.68	12 mo. end. June, 1931..	14,544,496	9,524,373a	.....	5,020,123	.....
Nov.....	729,407	8.21	615,613	6.18	60,457	29.25	12 mo. end. July, 1930..	14,729,585	9,801,814a	.....	4,927,771	.....
Dec.....	775,508	6.12	639,249	6.52	83,460	0.03	Calgary Municipal Railway, Calgary, Alta.						
Jan., 1931....	738,092	6.55	641,519	4.83	45,011	12.51	7 mo. end. July, 1931..	466,673	329,035	.....	.....	45,775
Feb.....	668,931	8.17	576,661	8.22	41,002	7.29	7 mo. end. July, 1930..	.....	.....	.....	.....	32,220
Mar.....	757,960	6.40	633,346	6.81	72,828	0.05	Connecticut Company, New Haven, Conn.						
Apr.....	745,252	6.72	620,106	7.06	73,837	3.46	8 mo. end. Aug. 1931..	7,210,118	5,351,803	357,277	1,621,527	614,732	
May.....	733,105	7.60	619,934	8.22	62,805	2.08	Edmonton Radial Railway, Edmonton, Alta.						
June.....	704,769	6.19	654,225	1.75	32,384	11.62	August, 1931....	51,948	39,650	.....	12,292	5,782
July.....	700,996	4.68	598,082	7.97	52,186	60.40	August, 1930....	55,330	43,449	.....	11,880	6,346
Aug.....	726,480	6.69	607,925	6.60	68,175	6.61	8 mo. end. Aug. 1931..	486,069	355,603	.....	130,466	32,933
New York, Westchester & Boston Railway, New York, N. Y.							Honolulu Rapid Transit Co., Honolulu, Hawaii						
Aug., 1930....	196,405	10.55	152,180	0.41	184,982	22.45	July, 1931....	85,552	50,790	7,337	29,679	17,389	
Sept.....	203,617	3.18	165,256	6.57	192,861	29.63	July, 1930....	90,581	50,616	9,059	32,351	21,239	
Oct.....	202,046	7.62	138,192	14.09	190,748	20.81	August, 1931....	85,402	53,316	7,337	16,462	15,085	
Nov.....	184,690	8.74	170,542	2.52	216,451	19.75	August, 1930....	86,480	50,902	9,149	16,918	16,326	
Dec.....	190,136	12.31	138,592	17.80	205,029	16.75	8 mo. end. Aug. 1931..	669,508	405,422	63,236	127,961	123,556	
Jan., 1931....	182,249	13.76	160,800	9.44	220,394	32.37	8 mo. end. Aug. 1930..	693,810	408,043	71,455	138,294	131,090	
Feb.....	161,311	15.02	149,571	11.18	222,308	29.48	Lethbridge Municipal Railway, Lethbridge, Alta.						
Mar.....	181,729	12.80	144,442	3.54	195,802	24.31	7 mo. end. July, 1931..	24,637	23,328	.....	.....	16,647
Apr.....	186,708	13.03	142,832	0.31	189,142	19.00	7 mo. end. July, 1930..	.....	.....	.....	.....	14,137
May.....	195,905	16.11	149,268	0.42	186,389	25.70	Mexico Tramways, Mexico City, Mex. (in pesos)						
June.....	193,280	14.62	142,600	3.45	183,007	23.70	July, 1931....	787,420	854,350a	.....	66,930	.....
July.....	195,461	12.92	146,820	0.40	188,581	23.56	July, 1930....	850,380	926,960a	.....	76,580	.....
Aug.....	180,965	8.79	142,111	6.62	197,099	6.65	7 mo. end. July, 1931..	5,403,970	5,986,120a	.....	682,160	.....
Northwestern Pacific Railroad, Sausalito, Cal.							New York State Railways, Rochester Lines						
Aug., 1930....	638,476	11.48	415,502	18.64	210,115	4.03	7 mo. end. July, 1931..	2,270,905	1,975,420	147,303	148,183	42,337	
Sept.....	548,282	8.68	471,657	3.78	16,471	83.57	7 mo. end. July, 1930..	2,641,823	2,148,482	149,909	342,431	.....
Oct.....	555,867	18.49	534,858	4.44	7,447	95.22	New York State Railways, Rochester, N. Y. (System)						
Nov.....	333,193	27.74	421,717	16.33	97,567	120.85	8 mo. end. Aug. 1931..	4,286,810	3,517,374	350,923	5,373	895,569	
Dec.....	312,319	20.77	465,220	3.46	158,941	74.63	8 mo. end. Aug. 1930..	5,339,970	4,298,365	355,539	152,039	.....
Jan., 1931....	283,852	21.78	401,656	14.41	123,928	14.76	New York State Railways, Syracuse Lines						
Feb.....	273,818	27.40	387,512	12.96	122,631	68.87	7 mo. end. July, 1931..	1,006,934	922,024	72,765	12,145	.....
Mar.....	308,466	24.17	408,068	14.43	109,856	48.21	7 mo. end. July, 1930..	1,165,930	997,565	74,336	93,999	.....
Apr.....	322,742	25.66	402,400	16.66	88,300	68.61	Pacific Electric Railway, Los Angeles, Cal.						
May.....	346,743	28.61	362,722	24.85	22,886	93.64	6 mo. end. June, 1931..	7,103,277	5,932,506	539,743	757,576	978,804	
June.....	380,604	24.50	368,559	17.82	1,970	95.39	6 mo. end. June, 1930..	8,014,552	6,825,728	542,682	854,148	948,222	
July.....	479,098	19.97	354,413	9.69	110,013	43.64	Regina Municipal Railway, Regina, Sask.						
Aug.....	464,342	27.27	.....	.....	.....	.....	7 mo. end. July, 1931..	182,287	148,974	.....	33,313	66,419
Staten Island Rapid Transit Company, New York, N. Y.							Seattle Municipal Street Railway, Seattle, Wash.						
Aug., 1930....	233,371	13.92	168,110	11.19	49,486	33.97	7 mo. end. July, 1930..	.....	.....	.....	.....	30,691
Sept.....	206,908	16.93	165,525	4.87	26,127	60.73	United Traction Co., Albany, N. Y.						
Oct.....	205,631	10.68	167,586	6.49	29,723	26.11	8 mo. end. Aug. 1931..	1,282,119	1,178,564	94,800	8,755	195,962	
Nov.....	178,652	17.42	161,608	0.58	10,788	80.37	8 mo. end. Aug. 1930..	1,514,271	1,313,988	92,029	108,254	.....
Dec.....	178,474	9.08	160,715	42.29	5,997	92.23	Youngstown Municipal Railway, Youngstown, Ohio						
Jan., 1931....	170,387	9.68	158,982	6.35	1,448	114.6	July, 1931....	111,486	122,838	.....	11,352	33,365
Feb.....	161,415	13.58	142,565	9.20	2,151	93.49	July, 1930....	.....	.....	.....	.....	14,170
Mar.....	173,723	7.98	159,035	7.78	1,164	81.24	<i>Italic figures indicate deficits. a Includes taxes.</i>						
Apr.....	176,863	10.76	147,210	13.23	23,169	31.97	ELECTRIC RAILWAY JOURNAL—October, 1931						
May.....	188,151	11.61	163,148	7.61	9,268	63.19	610						
June.....	204,452	9.12	150,345	16.01	39,203	0.38							
July.....	202,230	17.11	163,479	13.68	25,402	38.08							
Aug.....	197,386	16.42							

*Decreases or deficits are shown by italic figures.
†Net

NEWS of the Industry

Improvement Projects

Montreal, Que.—During the current year, Montreal Tramways has spent nearly \$2,000,000 on capital account. Additional trackage has been laid, subways have been constructed and various improvements and additions have been made to existing equipment. A notable addition to bus equipment this year has been the purchase of twenty new buses of modern design. Of these, fifteen were supplied by Associated Equipment Company of Canada, and the remainder from the Leyland Company. An important piece of construction is the erection of a tunnel underneath the Lachine Canal, at a cost of \$2,500,000, to which the Montreal Tramways is pledged to contribute not more than \$825,000.

South Bend, Ind.—A street car route to serve the new residential and industrial development in the region of the Bendix Aviation Corporation offices and plants here was put in operation on Sept. 22. This route, formerly known as the Washington Street line, was extended to serve its enlarged territory and will hereafter be known as the Bendix Drive line, according to George R. Green, vice-president and general manager of the Northern Indiana Railway.

Chicago, Ill.—After five weeks of intensive preparation, the great Western Avenue substation of the Chicago Surface Lines recently was moved 17 ft. eastward from its original location. The work was accomplished successfully in thirteen hours, and the electrical machines were in operation throughout the course of the moving. Many novel engineering expedients developed in the course of the preparations, but the entire operation, including installation of the trolley wire feeder cables in permanent locations and the foundation and back filling work was completed in considerably less than the scheduled time.

Brooklyn, N. Y.—The Civic Council of Brooklyn has approved a substitute of the plan advanced last spring by the engineering department of the Board of Transportation for the easterly extension of the Fulton Street four-track subway beyond Alabama Avenue. The new route will continue beyond Truxton Street to Rockaway Boulevard in Queens, thence along Rockaway Boulevard to 120th Avenue and easterly to 120th Avenue, Queens.

Fare Changes

Youngstown, Ohio—Weekly bus and street car passes will be reduced from \$1.25 to \$1 on Oct. 18 by the Youngstown Municipal Railway. Several months ago, the rate was reduced from \$1.50

Some Figures that Tell the Facts About Milwaukee

Figures made public for the first time since the new fare schedules went into effect on May 4, 1930, on the lines of the Milwaukee Electric Railway & Light Company show an increase of 0.02 per cent in gross passenger revenue for the first year under the pass and revised fares. The new rates went into effect at a time when all business was on the downward trend. Despite that, the Milwaukee company's metropolitan passenger revenue increased from \$8,562,696 to \$8,564,564. The gain was only \$1,868, but during the year unemployment increased in Milwaukee at least 20 per cent.

Since May 1, however, gross passenger revenue has been going down as the depression continues. For twelve months, ended Aug. 31, the gross revenue for the metropolitan area fell from \$8,571,210 in 1930 to \$8,375,930. The decrease was \$195,280, or 2.03 per cent. The figures for July, for instance, show a 5.1 per cent decrease in revenue.

The manner in which the company has held its own has brought many experts to Milwaukee to study its methods. The results of the first year of operation of the pass and new rates show that the city and suburban lines carried more passengers than the year before at a lower average rate of fare, and yet revenues held about stationary during severe economic depression.

The gross number of passengers carried during the twelve months from April 30, 1930, to April 30, 1931, was 196,394,472,

as compared to 180,756,845, an increase of 8.65 per cent. For the year ended Aug. 31, there was still an increase—193,617,873, as against 184,888,869, or 4.7 per cent.

For the year ending April 30, 1931, the distribution of riders was as follows:

Cash passengers dropped from 34,010,428, to 23,080,313, or 32.14 per cent, and ticket passengers from 92,457,048 to 26,367,445, or a drop of 71.48 per cent. Both the cash and ticket fare was increased on May 4, 1930. As against those figures, pass riders were 89,967,895, based upon a careful check showing that the

(Continued on Page 614)

Indiana Bus Bill Under Scrutiny

Another chapter has been written in the attempt to prevent publication of law by the Secretary of State of the so-called House Bill No. 6 when attorneys for citizens of Indianapolis and Muncie presented their oral arguments against the bill in Marion County Circuit Court. House Bill No. 6, as it stands, removes the control of all buses from the municipalities, and places it in the hands of the Public Service Commission. Plaintiffs contend that the act reached the office of the Secretary of State on the last night of the 1931 legislative session and was signed as a valid act of the Legislature without having been approved by the Senate. The Marion County grand jury has under way an investigation of the alleged irregularities in the bill's passage. A temporary injunction now restrains the Secretary of State from publishing the bill as a law.

Taxi Becomes a Menace

Business men have asked the City Council of Lincoln, Neb., to include in the new taxicab ordinance, now pending before it, a provision that the minimum fare shall be 15 cents. They base their plea entirely on the need of preserving service as furnished by the Lincoln Traction Company. Men out of work have put their cars into taxicab service, causing rate demoralization. In one instance a fleet of taxicabs is charging a uniform rate of 10 cents for the 5-mile ride to eastern and northeastern suburbs compared with the railway company rate of 12 cents. The communication sets out that the railway company probably could not for long survive this new competition. Fears are expressed that the company may seek to abandon its suburban lines. The proposed taxi ordinance requires meters for all cars, bans cruising and limits parking in downtown areas.

The Business Outlook

EVERYTHING now depends upon how far the administration's emergency efforts will restore public confidence, permit prompt pressure to be brought toward domestic re-inflation, and be supplemented as soon as possible by concerted international action. The securities and commodity markets are evidently still uncertain as to how thoroughly the deflation doctrine has been repudiated here and abroad, and how aggressively a reversal of the process will be carried out. Faced, further, with the prospect of continued unemployment, slack business, coming Congressional chaos, and prolonged political and financial instability abroad, they will probably be subject to extreme fluctuations for a considerable period. In the meantime, domestic business indicators show no definite turn for the better, but they still hold slightly above the bottom established by basic consumption requirements.

—The Business Week.

Bus Operations

Rome, Ga.—The Georgia Power Company has petitioned the City Commission to abandon its bus line route to Lindale through South Rome, and re-route the vehicles out Second Avenue and Maple Street to Lindale.

Rochester, N. Y.—The contract for use of bus routes of the New York State Railways in and between Rochester and Sodus Point, made on June 10, 1931, between W. T. Plumb and B. E. Tilton as receivers of the Rochester Railway and the New York State Railways and the Rochester Interurban Bus Line, Inc., has been approved by the Public Service Commission. The contract has also been approved by the United States District Court.

New York, N. Y.—Discussing operations of the Third Avenue Railway for the fiscal year ended June 30, last, Slaughter W. Huff, president, points out in the company's pamphlet report that the cost of bus operations during the year was reduced more than 4 cents a mile from the previous year, while receipts per bus-mile increased more than 1 cent. Substitution of buses for trolleys in Westchester is gradually taking place.

Houston, Tex.—The Houston Electric Company has been granted permission by Council to establish an express bus line to serve Southwood, between the I-G.N. tracks and Scott Street and Belmont, Grand Park and Foster Place additions, located just outside the city limits. The fare is to be 10 cents with transfer privileges.

Peoria, Ill.—The Illinois Power & Light Corporation will substitute trolley buses on certain routes here for trolley service, under authority of the Illinois Commerce Commission. Fares will remain unchanged. The seating capacity of the new buses will be larger than that of the street cars now in use. The amount of service will also be increased.

Sedalia, Mo.—The Public Service Commission has granted the City Light & Traction Company permission to substitute service by bus for its street car system.

Service Changes

Philadelphia, Pa.—Negotiations are in progress between the Delaware River Joint Commission and the Philadelphia Rapid Transit concerning the operation of the proposed line over the Delaware River Bridge. It is considered likely that the agreement with P.R.T. will be established on the basis of 3 cents for each passenger and that the fare on the line will be 10 cents. Officials have said it would be necessary to charge the same amount as passengers are now paying for a bus ride between Camden and Philadelphia. Engineers estimate that at least 65,000 persons will ride daily in high-speed electric trains when they are

in operation over the bridge. This figure is approximately 30 per cent of the 177,468 persons who crossed the river in buses, motor cars, ferries, horse-drawn vehicles and other means of transportation in a 24-hour period.

Chicago, Ill.—The City Council has adopted a resolution frowning upon the plan of the Chicago Surface Lines to place one-man cars on 26 routes. The request of the company for authority to use one-man cars is pending before the Illinois Commerce Commission. At a recent hearing on the request, William H. Sexton, corporation counsel, obtained a continuance of further hearings until he could ask the City Council to determine the city's policy on the matter.

La Crosse, Wis.—The city will likely oppose the petition of the Mississippi Valley Public Service Company to the Public Service Commission for a change in operating schedules of street cars and buses. The city feels that extra cars and buses should be put into service during rush hours of the day and evening. It has been suggested, that the company be permitted to abandon its car system on the 23rd Street line and substitute buses. The company petition requests: substitution of a fifteen-minute service on the north side line instead of present ten-minute service; substitution of fifteen-minute service on La Crosse Street-South Avenue bus line instead of the present twelve-minute schedule; and to discontinue operation of the 23rd Street line from 23rd Street to 4th and Main Streets, and substitute a fifteen-minute stub service.

Chicago, Ill.—Attorney Francis X. Busch, representing the Surface Lines, has served notice on the Illinois Commerce Commission that, if the one-man service is not allowed, the only alternative for the company will be the reduction in number of the two-man cars now in operation. The commission recently refused to issue a temporary order permitting one-man cars on certain designated cars, but authority from the commission is not needed to curtail service.

Wausau, Wis.—The Valley Transit Company, subsidiary of the Wisconsin Valley Electric Company, has withdrawn its petition with the Public Service Commission, in which it asked to be permitted to discontinue the bus service in Merrill. At a meeting of the company's officials and city officials, H. L. Geisse, vice-president, declared that the bus company has lost about \$30,000 since it started operation, but that the company

will endeavor, if it has the help of the people, to keep the line going for those who are constant riders. He asked citizens to suggest how the line can be operated without showing a loss.

Memphis, Tenn.—Thousands of visitors at the Mid-South Fair were permitted to inspect one of the new trolley buses of the Memphis Street Railway to be put in operation on the Lamar Avenue line about Oct. 15. R. N. Smith, "Operator No. 336," was in charge of the car all week. He will operate the new conveyance.

Kenosha, Wis.—The Metropolitan Motor Coach Company, Inc., which operated between Kenosha and the State line, has been authorized by the Public Service Commission of Wisconsin to abandon the route, which will be taken over by the North Shore Lines.

Financial News

Hammond, Ind.—H. K. Cuthberton, of the Public Service Commission, has indicated that State approval will be given to the sale of the Calumet Railways, Inc., by the Insull interests to Walter J. Cummings. Mr. Cummings pledged at the hearing that he immediately will expend \$150,000 to rehabilitate the system should the commission rescind an abandonment order obtained this year and approve the sale.

Detroit, Mich.—The Detroit Motor Bus Company has agreed to accept the offer of \$616,000 made by the Department of Street Railways of the city for its real estate plant with the proviso that it buy all other properties as well. The D. S. R. had said it was willing to pay \$232,000 for a number of new coaches. The company agreed to this. The remainder, consisting of 400 coaches of varying age, plus plant machinery and other equipment, was valued by the company at \$2,345,476. E. Cyril Bevans, spokesman for the company, asserted that a fair appraisal of the bus company property showed \$3,378,000 to be its reasonable present market value." He charged that the appraisal conducted by the city has been haphazard and superficial.

St. Louis, Mo.—The decision in the case under which the wages of the employees of the St. Louis Public Service Company went to arbitration was rendered on Oct. 9 upholding the plea of the company to the extent of a 10 per cent reduction.

Toronto, Ont.—A friendly settlement has been reached between the city and the Toronto Hydro by which the latter agrees to pay local improvement taxes on Hydro properties. According to the Globe, if pressure is exerted to bring the Toronto Transportation Commission, operating the municipal railway and bus lines, into the same tax-paying class, the adjustment may not be so easy, since any considerable invasion of its surplus would, conceivably, result in increased fares.

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Coming Meetings

Oct. 12-19—Annual Safety Congress Including Special Electric Railway Section, Chicago, Ill.

Oct. 29-30—Annual Transportation Meeting of Society of Automotive Engineers, Washington, D. C.

Nov. 19-20—Middle Atlantic States Equipment Men's Association, York, Pa.

Jan. 27-29, 1932—Electric Railway Association of Equipment Men, Southern Properties, Richmond, Va.

Rescinding of Baltimore's Park Tax Discussed

Mayor Jackson, of Baltimore, has let it be known that he does not see how he can at this time favor the elimination of the park tax now paid to the city by the United Railways & Electric Company. The Mayor said, however, that he intends to suggest to President Storrs that as to any other relief to which the company may feel it is entitled, his company present its case to the City Council.

The law passed by the Maryland General Assembly, authorizing the Mayor and City Council to eliminate the park tax, also provides for them to grant a reduction in the tax, if the city cares to render partial relief.

Early in September Mr. Storrs discussed the whole subject in a letter to the Mayor, who now says he will reply to this letter within a few days.

At a session of the City Council held on Oct. 5 a resolution was introduced designed to place the Council on record as unalterably opposed to either the elimination or reduction sought. The resolution was referred to the Board of Estimates without discussion. So far no ordinance has been introduced dealing with the subject.

Not for a long time has anything occurred in Baltimore which has aroused so much public interest and discussion as the move made to either abolish or reduce the park tax. A number of the neighborhood improvement associations have passed resolutions opposing any change.

Cleveland Rates Modified

A compromise rate schedule, proposed by officials of the Cleveland Railway when city authorities objected to the double increase of fares within a week, has been approved by Cleveland, East Cleveland and Cleveland Heights City Councils.

For a trial period of 60 days, the railway will charge a 10-cent cash fare and 7½-cent ticket rate (four tickets for 30 cents) in the city of Cleveland with a 1-cent charge for transfers.

Fares for through rides to East Cleveland and Cleveland Heights will be 12 cents cash or 9 cents by tickets, with five tickets for 45 cents. A ride wholly within either municipality will be the same as the Cleveland fare.

The compromise schedule for a 60-day trial period was advanced when city authorities objected to the proposed increase from 8 to 9 cents cash fare on Oct. 4, and a boost from 9 to 10 cents cash fare on Oct. 11.

While the cash fare in Cleveland has been increased 2 cents, the ticket fare has been raised less than half a cent, to induce regular riding.

Mayor Wants Transportation Matter Settled

Mayor Miller of St. Louis, Mo., in a message to the Aldermen on Sept. 25 urged the board to "find an early answer to the vexing question" of mass transportation, pointing out that nearly \$35,000,000 in bonds and notes of the St. Louis Public Service Company will mature



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within the next three years. The Aldermen last spring retained former-Congressman Cleveland A. Newton to serve as special counsel in transportation matters. The Mayor said:

Through the report of the Transportation Survey Commission and an earlier report prepared by the city's then consulting engineer, C. E. Smith, your board is in possession of all the facts available on this subject. You have the benefit of the opinion of experts, arrived at after long and careful study, not only of the transportation question generally, but of those phases of it peculiar to our local situation. With the help of former-Congressman Newton, who has been specially employed for this purpose, it should not be difficult for your board to find an early answer to this vexing question.

Delay in finding such answer before the maturity of the bond issue and note and before the expiration of the present franchises a few years later, might seriously embarrass our car riders and St. Louis business interests. I earnestly recommend that your board devise a satisfactory plan for the solution of this transportation problem before the close of the present session.

Financial News

(Continued from Page 612)

Buffalo, N. Y.—The International Railway has brought suit to recover \$2,823, representing an alleged overpayment on its corporation income tax for the 1928 calendar year. After the payment of an original tax of \$87,656, the income tax bureau increased the tax liability to \$103,080. During the year 1928, the company purchased for retirement \$272,000, par value, bonds of the Buffalo Railway, the Crosstown Street

Railway, and the Buffalo & Niagara Falls Electric Railway for \$248,467. The company now disputes the validity of the order of the income tax department, requiring it to pay a tax on the profit on the bonds so retired.

Regulation and Legal

Columbus, Ohio—The State Utilities Commission has sustained its former order, rejecting a proposal of the Lake Shore Electric and others to cancel their joint tariffs with the "western chain" of Ohio interurban railways. The application to cancel the tariffs was filed to become effective Jan. 17, 1930, but the commission postponed the effective date and in its answer the "western chain" contended a monopoly would be established, should the proposal be approved. The "western chain" is comprised of the Dayton & Troy, Western Ohio Railway & Power, Findlay, Arcadia & Fostoria and the Fostoria & Fremont Railroad. As a result of the action just taken the joint tariffs will be continued in effect.

General

Baltimore, Md.—The Consolidated Gas, Electric Light & Power Company has announced the consummation of a twenty-year contract for power with the Pennsylvania Railroad covering the entire electrification requirements of the Pennsylvania system from the Susquehanna River at Havre de Grace, Md., to Washington. Power for this line will be supplied early in 1933.

Jacksonville, Fla.—Members of the City Council's special franchise committee are said to look with favor upon alternative proposals made by the Jacksonville Traction Company for a new franchise to replace the one under which that firm now operates but which expires next January. Under terms of the new proposal the company asks for a net return of 8 per cent upon a capital investment of \$2,500,000, and offers to pay a 3 per cent gross tax to the city out of surplus returns over 8 per cent net to the company.

Detroit, Mich.—The Miller-Schorn plan advanced for stimulating street car riding here will go on the ballot at the election next month. Last spring a plan of between-tracks safety depots and associated subwalks in combination with express street car and local bus service was lined up for submission to the people, but the matter did not appear on the spring ballot under promise that the plan would appear at the fall election. Within the last two weeks 49,000 signatures were secured requesting that the matter be placed on the ballot, with but 25,228 signatures actually required. The City Clerk has since certified to the Common Council that more than the necessary signatures had been supplied for this proposition to be placed before the people on Nov. 3.

Results in British Columbia

A reduction of nearly 2,000,000 passengers for the year as compared with the previous year's operations was revealed in the annual report of the British Columbia Power Corporation, controlling the British Columbia Electric Railway and subsidiary companies. Slowing up in the building trade and condition of the lumber business, two important industries centered in Vancouver, are largely responsible for the decline in the number of passengers carried. Car mileage increased 561,000 over the previous year due largely to the increased number of cars in service during rush hours. Freight revenue, being largely dependent on the movement of transcontinental freight showed a heavy decline. In a five-year survey the report shows:

	Passengers Carried	Freight Tonnage
1931.....	74,249,659	343,320
1930.....	76,113,515	454,111
1929.....	77,694,731	553,391
1928.....	77,063,656	487,890
1927.....	75,113,022	481,699

Facts About Milwaukee

(Continued from Page 611)

average passholder gets 22 rides per pass. Transfer rides on the pass were 36,803,271 at the rate of nine transfers per weekly pass. Transfers during the same time dropped from 54,289,369 to 20,175,548, due to the decrease in cash and ticket riding and the popularity of the pass.

Under the unusual efforts made through various types of cut-rate passes, riding increased by 25,000 to 30,000 passengers a day. Peak-hour riding, however, decreased by about 31,000 passengers a day, but the off-peak riding has increased by 56,000 to 61,000 passengers daily. Short-haul riding in the downtown and outlying districts has been stimulated through the pass and more liberal transfer privileges.

The company estimates that 67 per cent of its riding is by the pass and that the average fare on the pass now is 4.55 cents a ride. Figuring that 16 per cent of its passengers pay cash, and 17 per cent buy tickets, it points out that the average fare now is 6.1 cents a ride as against 6.76 cents before May 4, 1930.

The commission's prediction that the new fares would give the utility \$400,000 in additional revenue has not materialized. In anticipation of the theoretical increase, electric light rates to residential and small commercial users were reduced \$482,000 as an offset. The reductions in the rates for electricity will, however, remain in effect.

The coming of the pass has helped to increase the car speed in Milwaukee's metropolitan area from 9.261 m.p.h. to 9.733 m.p.h. the first year and to 9.86 m.p.h. at present. Prior to the pass, car speed was slowing up. The time consumed by the trainman now in handling cash, tickets, etc., is 60 per cent less than formerly. Nearly 78 per cent of the evening rush-hour rides require no fare handling.

It is also pointed out that in 1926 6 per cent of the metropolitan area was more than one-quarter mile from a street car or bus line while now only 3.2 per cent of the area is in that category.

Foreign News

British Railroads Hostile to Electrification Report

Proposals made in the report of the Weir committee on main-line electrification have been submitted by the Government to the railroads, but there appears to be no likelihood of a reply calculated to lead to early action on the lines suggested by the committee. In the present financial position of the companies, even with a large measure of Government assistance, an expenditure of \$1,305,000,000 spread over a number of years, requires very serious consideration, and the reports received by the railroads from their experts are likely to induce the general managers to approach main-line electrification cautiously.

During the present period of depression the possibility of a combine to include the main-line railways and their competitors has been broached, but opposition to any such plan remains strong.

So far the railroads have not yet replied to the Government's request to furnish their observations upon the Weir report, but it is known that they are definitely against it. Even taking the figures put forward by the committee, which may be regarded as showing the case for electrification in a favorable light, the feeling is that the companies would not be justified in contemplating the expenditure of so large a sum, in view of the way in which their traffic receipts are shrinking.

Suburban electrification, however, stands on a different footing. Here the committee estimates that there will be a return of 13 per cent on a capital expenditure of \$225,000,000. This is a far less speculative proposition, especially in view of the agreement under which the suburban lines will be included in the London traffic pool. When the London Passenger Transport Bill is passed into law much is likely to be heard about suburban-line electrification.

Trolley Bus Progresses in England

The extensions of the trolley bus system on the routes of the London United Tramways, described recently in *ELECTRIC RAILWAY JOURNAL*, are now nearing completion. In Nottingham the Corporation has ordered thirteen trolley buses, while Chesterfield Corporation has two such buses on order.

New Subway Traffic Record set Up in London

A subway traffic record of more than 30 years' standing was broken in London recently, when more than 300,000 people attended the Royal Air Force Pageant at Colindale. The number of passengers arriving at the Colindale Station of the London Underground Railway during the day was 108,000, or 10,000 more than last year and the highest number ever handled at any subway station on a single day. If allowance is made for the huge crowds of people arriving at Hendon and Burnt Oak stations (close to Colindale) for the pageant, the total number of those

traveling in the two directions during the day would be not less than 250,000. The previous subway traffic record was made 30 years ago at the Bank Station of the Central London Railway on the occasion of the celebration of the return of the City Imperial Volunteers after the South African War. Although this record has been approached on several occasions, it had never been broken before.

Bow Collectors for Glasgow

The Glasgow Corporation Transport Department has decided to fit all its street cars with a new type of overhead collector. The invention of Fischer de Tovaros, consulting electrical engineer to the Budapest City Tramways. The Fischer bow collector takes the form of a special steel plate, 39 in. long by 4 in. wide, with grooves 24 in. long by 1/2 in. wide and 1/4 in. deep, filled with grease, which reduces wear, minimizes breakage, and prevents the formation of ice. At terminals reversal of the collector is automatic. The collector is almost noiseless in operation, is completely free from sparking, whistling and vibration, and causes no interference to radio reception. The Glasgow authorities began experimenting with the Fischer bow five years ago, when eight cars were so equipped. Birmingham, Aberdeen and several other cities are also trying the device.

Electrification of Russian Railroads

The work of electrifying new railroad lines in the U.S.S.R. was recently begun. In the Urals operations are in progress on the Lunevsk branch carrying coal from the Kizel Basin. This branch will be electrified for a distance of 113 km. Work has already begun in the Leningrad-Oranienbaum district with a branch to Gatchina, and on the Mineralnye Vody branch, in the Caucasus, from Mineralnye Vody Station to Kislovodsk. The length of each of these electrified branches will be 72 km. The first Soviet electric engines will be built at the Kolomma factory in the Moscow region.

London, England—In spite of the prospect that the London County Council tramways may be transferred to the proposed Transport Board, the County Council continues its schemes of improvement. E. Sanger, chairman of the Council, recently recalled that the subway between Victoria Embankment and Southampton Row, which formerly could take only single-deck cars, was reopened for traffic on Jan. 14 last after it had been rebuilt to accommodate double-deck cars. The stations on the subway were modernized and an improved scheme of lighting was installed. At the tramway power station in Greenwich a new and more economical plant of increased capacity is being substituted for old plant at an estimated cost of £450,000. Arrangements have been made for modernizing the fleet of tramcars and for anticipating future demands.

Lanarkshire, Scotland—The tramway routes of the Lanarkshire Transport Company have ceased operation. Service by bus has been substituted.

PERSONAL MENTION

G. D. McGwinn Succeeds

Colonel J. H. Alexander

Announcement was made in Cleveland, Ohio, on Oct. 7 of the election of George D. McGwinn as president of the Cleveland Railway to succeed Joseph H. Alexander, resigned. Mr. McGwinn has been a vice-president of the company since last May when the Van Sweringen interests became active in the affairs of the company through the placing of C. L. Bradley, Alva Bradley, Col. Otto Miller and Mr. McGwinn in executive posts with the railway.

Colonel Alexander said he planned to remain in Cleveland and establish an office as a railway consultant. In his letter of resignation he said:

I have for some time been giving consideration to the severance of my connection with the Cleveland Railway before the expiration of my present term. For a variety of reasons, with which the chairman is familiar, permit me herewith to tender my resignation as director, member of the Executive Committee and president, effective immediately.

No indication is contained in the account of the change in the *Cleveland Plain Dealer* that an official statement regarding the matter was made by the management, but that paper did pay a gracious compliment to both men in an editorial which it concluded in part as follows:

The substitution of George McGwinn for Joseph H. Alexander in the president's chair was not unexpected. So far as the administrative direction of the company goes it means little. To many, the departure of Colonel Alexander from an enterprise with which he has been connected since the days of Tom L. Johnson brings a pang of regret. He has had an important part in giving this city what, in spite of its present woes, is one of the best electric railway systems in America. His successor has a record of administrative achievement which justifies the esteem in which he is held both by his employers and by the community.

From the time of his graduation from the Case School of Applied Science with a degree in mechanical engineering in 1905, with the exception of service as assistant to the general manager of the Pittsburgh Railways for a few years, and absence from duty with the engineering forces during the War, Colonel Alexander's activities have been confined to the local transportation system in Cleveland. Immediately following his graduation from the Case School, he took a position as chief engineer with Tom Johnson's Municipal Traction Company in that city, and in the bitter struggle for supremacy between rival street railway interests which kept the city in a turmoil for the next four or five years Mr. Alexander fought shoulder to shoulder with his chief. The outcome of that battle was the Tayler franchise, a model of its sort, under which the Cleveland properties have operated with conspicuous success ever since.

Following his experience in Pittsburgh Colonel Alexander returned to Cleveland as chief engineer in the office of Peter Witt, at that time the city's transit commissioner, where he rendered exceptional service in assisting to solve the local transportation problems. In this capacity he



G. D. McGwinn

attracted the attention of the late John J. Stanley, the doughty president of the Cleveland Railway, who engaged his services in 1916 as assistant to the president. Responding shortly afterwards to the nation's call to arms he received an appointment as major in the administrative section of the construction division of the army, being presently advanced to the rank of colonel. Under his general direction at one time were the labors of nearly 400,000 men engaged on contracts involving the expenditure of approximately \$1,500,000,000.

Returning to his job at Cleveland he was elevated to the vice-presidency of his company, which office he filled until the death of Mr. Stanley in October, 1926, when he succeeded to the presidency.

In addition to his official duties, Colonel Alexander has found time to take an active part in the affairs of the A.E.R.A., of which he is now first vice-president, as well as to take part in many local activities in the city of Cleveland. Among other honors which have been bestowed upon him have been the presidency of the Cleveland Engineering Society, the presidency of the Cleveland Safety Council and the presidency of the Ohio Safety Council.

Mr. McGwinn went into electric railway



Col. J. H. Alexander

operation in Cleveland more than a year ago through the channels of building management and construction. He had previously been a specialist in building management. Among the structures of which he was in charge were the Citizens' and the Union Commerce National Bank buildings in Cleveland. When the Union Trust merger was brought about, Mr. McGwinn was confronted with the problem of housing the forces of four banks in a building that was considered too small for one. He managed it for three years, while the Union Trust building was under construction, and then was made vice-president and building manager of the Union Trust Company.

Veteran Cincinnati Employee Honored

More than twenty-five executives and operating officials of the Cincinnati Street Railway, Cincinnati, Ohio, assembled on Sept. 15 at the Gibson Hotel to honor F. J. Venning, superintendent of power, on the occasion of his 70th birthday. The affair was a surprise to Mr. Venning, who had a luncheon engagement with his general manager, J. B. Stewart, Jr., to go over various company matters. Instead of going to the dining room on their arrival at the hotel, Mr. Stewart piloted the way to one of the private dining rooms, in which were assembled his fellow associates, headed by Walter A. Draper, president of the railway.

Rounding out 51 years of service in the electrical business, Mr. Venning's first work in electrification of horse cars was in Savannah, Ga., in 1890, when he installed the first railway motor installed by the Westinghouse company. Prior to this time, he was employed by the Pennsylvania Railroad as a fireman, then as an engineer. In 1889 he joined the Westinghouse company, installing electric motors. In 1893 he joined the Citizens' Traction Company of Pittsburgh, where he remained until 1910, when he entered the service of the Cincinnati Street Railway. On March 1, 1918, Mr. Venning was appointed superintendent of overhead lines and two years later took over the superintendency of shops and equipment. On Feb. 1, 1926, he was appointed superintendent of power, which position he holds at the present time.

John F. Collins Made Receiver at Saginaw

John F. Collins, Jackson, Mich., has been appointed receiver for the Saginaw Transit Company, Saginaw, Mich., by Judge Tuttle in the United States District Court. The Saginaw Transit Company operates street cars and buses in Saginaw as well as a short interurban line to Zilwaukie.

Approximately 200 miles of railroad are now operated by Mr. Collins. The systems included under his direction are: the Lansing Transportation Company, the Jackson Transportation Company, the Battle Creek Transportation Company, the Kalamazoo Transportation Company, the Saginaw Transit Company, and the Eastern Michigan-Toledo Railroad, of which he is the receiver.

C. O. Guernsey Directs Brill Engineering Activities

All Brill engineering activities have been placed under the direction of Charles O. Guernsey as chief engineer of the J. G. Brill Company and its subsidiary companies.

Mr. Guernsey has been connected with the Brill organization since 1923. During his association with Brill he has taken a keen interest in the modern trend in the design of electric railway rolling stock and other types of urban and interurban transportation equipment. The rapidly increasing prominence of the trolley bus as a factor in the public passenger transportation field resulted in Mr. Guernsey's appointment as chief automotive engineer on Jan. 1 last. Subsequently, the apparently successful application of worm and other modern type drives to electric car trucks, streamline body design and other similarly modern practices resulted in the unification of all Brill engineering activities under Mr. Guernsey's direction. He will be located at the Philadelphia plant.

For ten years before he joined the Brill organization, Mr. Guernsey was affiliated with the Service Motor Truck Company, Wabash, Ind., as chief engineer and later as vice-president in charge of the company's railroad division, the activities of which were transferred to the Brill Company in 1923 at which time Mr. Guernsey was appointed chief engineer, automotive car division. Under his direction the extensive line of Brill rail motor cars for steam railroads was developed.

Herbert Morrison Withdraws as Transport Minister

Herbert Morrison, Minister of Transport in the English Labor Government, has declined to carry on under the new National Government. He was practically the promoter of the London passenger transport bill, intended to promote the co-ordination of the London passenger services. Even the motor transport people were quick to recognize the service Mr. Morrison has performed, and to express regret at his decision not to throw in his lot with the newly formed National Government. A contemporary in that field says:

The decision is all the more important in view of the announcement that the London passenger transport bill will be proceeded with as an agreed measure. Whatever the future may hold for Mr. Morrison and his party, we shall always be grateful to him for having put real life into the Ministry of Transport. He has displayed a practical appreciation of the industry's point of view, and thus ensured its co-operation in the important measures which have marked his spell of office. Mr. Morrison will certainly be remembered as one of the most successful Ministers of Transport.

A. V. Guillou With Wisconsin Commission

A. V. Guillou, for 4½ years assistant chief engineer for the California Railroad Commission, has resigned to become chief engineer of the newly reorganized Public Service Commission of Wisconsin. Prior to his connection with the California Commission, Mr. Guillou was associated with a number of California power companies. After

his graduation from the University of California in 1912, he spent two years with the Westinghouse Electric & Manufacturing Company in East Pittsburgh, and then joined the Pacific Light & Power Corporation, later merged with the Southern California Edison Company as commercial salesman. Later he became district manager for the Mount Whitney Power & Electric Company. When that company was taken over by the Edison Company in 1919.

P. J. Pybus Minister of Transport

P. J. Pybus, Liberal member of Parliament for Harwich, has been appointed British Minister of Transport. Mr. Pybus is a well-known business man, and is a director of the English Electric and other companies. G. M. Gillett, Labor member of Parliament for Finsbury who, in the last government, was secretary to the

Department of Overseas Trade, has been appointed Parliamentary Secretary to the Ministry of Transport, in succession to J. A. Parkinson, Labor member for Wigan. Mr. Pybus is a member of the Institution of Electrical Engineers. In 1917 he was created a C.B.E. for his services to the Ministry of Munitions during the war. He has been a member of various government commissions and committees.

Charles H. Forsgard, who has been acting general manager of the Community Traction Company in Toledo for nearly four years, has been made vice-president and general manager and elected a director of the company. Overwhelming approval of the ten-year extension of the service-at-cost ordinance by the electorate was taken partially as a compliment to Mr. Forsgard for the many operating improvements and economies together with unification of bus and street railway service under his guidance.

W. B. Wheeler Made Superintendent of Transportation



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W. B. Wheeler

William B. Wheeler, who has had a long, practical and successful career in street railway work in the Metropolitan District of New York, has been advanced to superintendent of transportation of the trolley and bus lines of the Third Avenue Railway System, New York.

With very little opportunity for formal schooling in his formative years, and with no personal influence back of him, Mr. Wheeler has fought his way up through all the stages, educating himself as he went along and winning promotion by deserving promotion. His many friends who have recognized his sterling qualities, his indomitable ambition and his determination to make good are expressing their gratification at this latest recognition of Mr. Wheeler's abilities, not only on his account, important as that is, but because of the message of encouragement which that recognition carries to other men in the ranks.

Even to his superiors, the intensity of the man has been a source of wonder. Mr. Wheeler has found time for other activities, some collateral with the street railway enterprise. He took an active part

in the affairs of the Metropolitan Section of the A.E.R.A., and was president of that organization. He has been for a number of years on the board of fire commissioners in New Rochelle where he makes his home. He has also served as president of the Republican Club in New Rochelle.

Mr. Wheeler was born in Brooklyn on Oct. 13, 1873. He received his early education in the public schools of that city. The training was brief, however, as at the age of twelve, upon the death of his father, he was obliged to go to work to help support the members of his family. Later he engaged in the photographic business with success, only to see this enterprise go on the rocks in the panic of 1894. But he was not to be dissuaded. He again began at the bottom as a conductor on the Atlantic Avenue Railroad in Brooklyn, determined to make street railway transportation his life work. He was attracted by the opportunities offered in Manhattan by the Metropolitan Street Railway System, and became in time a conductor on the Broadway cable line. A few years later he became a starter at the Lenox Avenue Depot.

So he continued to advance up through the various grades, educating himself in the various collateral lines, until he became general superintendent of the Westchester Electric Railroad, operating trolley lines in New Rochelle and Mount Vernon. He was holding this position in 1919 when President Huff of the Third Avenue Railway System commissioned Superintendent William E. Thompson to reorganize the transportation department. In this reorganization Mr. Wheeler was selected first as superintendent of schedules and later as assistant superintendent of transportation. This position he has filled successfully for a number of year, and upon the relinquishing of the active duties of the transportation department by vice-President Thompson, he became the active head of the department as superintendent of transportation.

Many Promotions Made by Penn-Ohio System

William Muldoon to Fill New Position of General Superintendent—Added Responsibilities for Messrs. Brackett, Weller, Giltner, McKenna and Shaner

THE new position of general superintendent of the Penn-Ohio Transportation System, comprising electric railway and bus service in Youngstown and Warren, Ohio, and New Castle and Sharon, Pa., and connecting those cities, has been filled by the appointment of William Muldoon. As general superintendent, he will have direct charge of the operating, maintenance of way and maintenance of equipment departments.

When the service-at-cost franchise was adopted for the city railway and bus operation in Youngstown in January, 1919, Mr. Muldoon was selected by William L. Sause,

and interurban lines connecting those cities and also Warren, Niles and Leavittsburg, Ohio. Mr. Brackett went to Youngstown in 1916 as dispatcher for the Youngstown Municipal Railway following nine years as dispatcher and inspector at Houston, Tex. He was placed in charge of the Haselton carhouse, Youngstown, as foreman in 1918, and was promoted to general shop foreman in January, 1923. Four years later he was promoted to assistant superintendent of equipment, a position in which he has continued up to the present.

Perry R. Weller has been appointed superintendent of automotive equipment

chief claim agent for the transportation companies centering on Akron, Ohio, has been appointed general claim agent of the Penn-Ohio Transportation System with headquarters in Youngstown. In his new position Mr. Giltner has charge of the claim departments of the Youngstown Municipal Railway, the West End Traction Company, the East End Traction Company, the New Castle Electric Street Railway, the Shenango Valley Traction Company, Penn-Ohio Coach Lines Company and affiliated transportation companies serving Youngstown, Warren and Niles, Ohio, and New Castle and Sharon, Pa., and connecting those places.

Mr. Giltner's connection with the electric railway industry dates from 1907 when he joined the claim department of the Indiana Union Traction Company, Anderson, Ind. Subsequently he was assistant chief claim agent for the Portland Railway, Light & Power Company, Portland, Ore., assistant chief of the adjustment bureau of the associated bureaus of the Pittsburgh Railways, and superintendent of the Pittsburgh claim department of the London Guaranty & Accident Company, Ltd. In May, 1918, Mr. Giltner went to Akron as assistant chief claim agent of the Northern Ohio Traction & Light Company, and three years later became chief claim agent, continuing in that post till his appointment to the Youngstown properties.

George E. McKenna has been promoted from assistant chief claim agent to chief claim agent of the Akron Transportation Company, Northern Ohio Interurban Company and Penn-Ohio Coach Lines Company, Akron, to succeed J. W. Giltner. Mr. McKenna has been assistant chief claim agent at Akron since March 15, 1922. He entered railway claim work in Buffalo, N. Y., in 1913 and continued in that work in Buffalo and in New York City for four years. Following eighteen months' service in the U. S. Marine Corps during the World War, he went to Akron and entered the claim department of the Northern Ohio Traction & Light Company in September, 1920.

C. Howard Shaner has been appointed safety supervisor of the Akron Transportation Company, Northern Ohio Interurban Company and Penn-Ohio Coach Lines Company, Akron, succeeding Glenn H. Shaw, who has been appointed director of safety of Ohio Edison Company. Mr. Shaner continues as safety supervisor of the Youngstown Municipal Railway and other companies with headquarters in Youngstown, Ohio, where he has been supervisor of the accident prevention work since Sept. 1, 1922.

During this period these companies, comprising the Penn-Ohio System, have won highest national awards three times, the Charles A. Coffin gold medal for the system in 1926, the Anthony N. Brady gold medal for the system for 1927 and the Coffin gold medal again for the Youngstown Municipal Railway in 1930.

Mr. Shaner entered railway work as a trainman for the Pittsburgh, McKeesport & Connellsville Railway in McKeesport in 1902. He went to Youngstown as a street car operator in 1909, and was selected as safety supervisor of the Youngstown Municipal Railway in 1922. Soon thereafter, however, his duties were enlarged to include the entire Penn-Ohio System.



1. G. E. McKenna
2. William Muldoon
3. A. D. Brackett
4. P. R. Weller
5. J. W. Giltner
6. C. H. Shaner

Youngstown's first street railway commissioner, as his assistant, and he continued in that post until the present time, having intimate connection with the operation and development of the Youngstown lines. Prior to entering the commissioner's office, Mr. Muldoon was deputy clerk of the Youngstown City Council for ten years. Before that he was employed in the offices of the Wabash Railroad in Chicago and of the Pennsylvania Railroad in Youngstown.

A. D. Brackett, for more than four years assistant superintendent of equipment, has been appointed superintendent of car equipment of the Penn-Ohio System, comprising electric railway lines in Youngstown, Ohio, New Castle and Sharon, Pa.,

of the Youngstown Municipal Railway and affiliated companies of the Penn-Ohio System, with headquarters in Youngstown. Mr. Weller has been connected with the company since April, 1925, prior to which he was with the service department of the Buick Motor Company at Indianapolis. He entered the employ of the Penn-Ohio in charge of cost control in the maintenance of way department. In 1926 he was made statistician and research engineer in the commercial department, and two years later was appointed general foreman of the Mahoning Avenue garage, Youngstown. He continued in that position till his promotion to superintendent of automotive equipment for the system.

J. W. Giltner, for the last ten years

J. W. Maxwell Heads Seattle Commission

The Municipal Railway Commission at Seattle, Wash., has chosen J. W. Maxwell, vice-president of the National Bank of Commerce, as chairman of the commission which will undertake to outline a program for operating the municipal railway. The Commission has been assured by Mayor Harlin and the City Council that it will have a free hand in its endeavors, and in the appointment of a railway manager. The commission has established offices in the City-County Building, and invites suggestions from citizens. Under the present provisions of the city charter, the commission can act only as advisers to the City Council.

In accordance with the Council resolution creating the commission, its members drew lots to determine the length of their respective terms. A. A. Murphy drew the one-year term; Rowland W. Watson, the two-year term; Mr. Maxwell, the three-year term; Charles P. Moriarity, the four-year term, and N. D. Moore, the five year term. Succeeding appointments will be made by the Mayor for five years.

H. W. Olcott, Jr., long connected with the Insull interests in publicity and advertising work in Chicago, South Bend and Indianapolis, has resigned from the Interstate Public Service Company to join his father in the insurance brokerage business in New York. At Indianapolis he was manager of publicity and advertising for the Interstate and other companies. Mr. Olcott wrote on his chosen subjects in a sprightly manner, but one that reflected a thorough knowledge of the topics he discussed, and that carried conviction. For more than five years he was a contributor to *ELECTRIC RAILWAY JOURNAL*.

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Arthur G. Kjellgren, for the past nineteen years employed by the Rockford Traction Company, Rockford, Ill., has been appointed general superintendent of transportation for the Central Illinois Electric & Gas Company, a position newly established further to coordinate the various departments of the company under one direction. He has recently been trammaster in charge of all interurban cars and buses.

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Thomas N. McCarter, president of the Public Service Corporation of New Jersey and a brother of the late Uzal H. McCarter, long president of the Fidelity Union Trust Company, Newark, has been made chairman of the Executive Committee of the bank, a new post.

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Lawrence B. Sizer has been appointed to the position in advertising and publicity work for the Insull interests at Indianapolis held by H. W. Olcott, Jr. Mr. Sizer has been engaged in utility publicity work for about three years. He has had well-rounded experience in newspaper work, climaxed by a term as sports editor of the Benton Harbor (Mich.) *News-Palladium*. That in itself is severe training, for sports recording must be done with gusto and accuracy. Every reader of the news of sports has his heroes. And the way of the writer who does any of these heroes even a seeming injustice is not easy.

OBITUARY

Thomas Scott

Thomas Scott, general roadmaster of the Montreal Tramways, Montreal, Que., died recently after almost 40 years service with that organization. During that time this pioneer street railway builder personally supervised the installation of all the present 300-mile track system in Montreal. Moreover, the personnel of the track department of the Montreal Company includes three sons, a son-in-law, and several grandchildren of Mr. Scott, all of whom received their training under his broad experience, forceful personality and unexcelled knowledge of city railway track work.

When Mr. Scott joined the old Montreal horse car system in 1892, he found tracks built of flat strap rail spiked to 6x8 in. wooden stringers. In the three following years this construction was entirely replaced by 56-lb. tee 72-lb. girder and the 88-lb. girder guard rails, laid on 7-ft. ties with wood block paving. Subsequently, in 1899, such construction was in turn replaced by 87-lb. high tee rail supported on concrete stringers with scoria block paving. Finally in 1911 and 1913 to date, the present Montreal standards of track construction, consisting of 115-lb. girder grooved and 132-lb. girder guard rails on 8-ft. wood ties, stone ballast foundation, concrete paving base and granite block or sheet asphalt paving were installed by the Montreal roadmaster. Mr. Scott spoke with authority on tramway construction methods in use before hack saws, acetylene torches, crane cars and other mechanical aids were known.

Born at Salisbury, N. B., in 1860, the late roadmaster commenced an active railroad career when sixteen years of age by assisting his father to build the Canadian Pacific Railway line between Edmundston and Saint Leonard. Following completion of this work, he was engaged with the Miramichi Railroad, then constructing a line between Marysville and Woodstock, N. B. Later he assumed charge of the Greenville Junction Section on the Canadian Pacific Railway.

In 1892, when the Montreal Street Railway commenced to install track for the first electric lines in that city, Thomas Scott was called to Montreal by the late F. P. Brothers. Subsequently, in 1897, he laid 25 miles of electrified track for the Jamaica Electric Railroad in Kingston, Jamaica; and later, in 1899 and 1900, built some 10 miles of line in Georgetown, British Guiana.

William Scott, eldest son of Thomas Scott, has been appointed to succeed him as general roadmaster in Montreal.

R. S. Campbell

Robert Stewart Campbell, a prominent figure in the electrical industry 30 years ago in Salt Lake City, died at his home in that city on Sept. 5. Mr. Campbell was born in Salt Lake City in 1854, and secured his electrical engineering education at the University of Utah. In 1873 he entered the employ of the Utah Northern Railway, at Logan, Utah, and later was elected

Mayor of that city, in which capacity he served two terms. After spending several years in general business, he became manager of the Utah Light & Power Company, with supervision also over the street railway system in Salt Lake City. In 1906 he negotiated the sale of the company to the E. H. Harriman interests.

Gus Koch

Gus Koch, for many years coast agent of the St. Louis Car Company, died on Sept. 19 of injuries resulting from an automobile accident on Sept. 17 while he was crossing Kearny Street at Sutter Street in San Francisco. For more than 30 years he ably represented the St. Louis Car Company. Mr. Koch would have attained the age of 81 years on Sept. 24. During his later years, Edward S. Sullivan, his office associate and friend for more than 25 years, acted as his assistant and succeeds to his office as Coast agent. Mr. Koch played an important part in the early development of electric transportation on the Coast. Few railroad men on the Coast were more widely known or held in higher regard.

G. B. Willcutt

George B. Willcutt, vice-president and secretary and a member of the board of directors of the Market Street Railway, San Francisco, died in that city on Sept. 17, at the age of 72. He was the dean of local transportation men on the Pacific Coast, having completed 45 years association with the Market Street Railway and its predecessors. At the time of his death, he was also assistant secretary of the California Oregon Power Company, a position which he had held for some years. He was graduated from the University of California with the class of 1879, and later studied at the Massachusetts Institute of Technology, from which he was graduated in 1883. Prior to entering the street railway business, he was a mining engineer and was one of the original engineers on the famous Anaconda mine in Montana.

Col. Edward Alfred Simmons, publisher of *The Railway Age* and several other publications, died of a cerebral hemorrhage on Sept. 30 in his home in Brooklyn. He was 56 years old. Although it was necessary for him to leave school when he was only fourteen years old, Colonel Simmons rose to prominence as a publisher, manufacturer, soldier and civic worker and became a leader in many clubs and national societies. For twenty years he had been president of the Simmons-Boardman Publishing Company. He also was chairman and president of the American Saw Works, the American Machine Tool Company and the Rogers-Eagle Grinding Machine Company, all of Hacketts-town, N. J.

INDUSTRY MARKET AND TRADE NEWS

Bids Received for New York Subway Cars

The cost of 300 additional cars fully equipped for service on the Bronx, Long Island City and Coney Island sections of the new city subway system will be about 27 per cent less than that of the 300 cars ordered eighteen months ago, according to the Board of Transportation. Four bids were received for the cars, and two for the motors and control.

The lowest bid of \$6,326,400 for the construction of 300 was submitted by the American Car & Foundry Company, the builder of the first 300 cars. Westinghouse Electric & Manufacturing Company, which also equipped the original order, submitted the lowest bid of \$2,220,000 for the motor and control equipment for 300 cars. Bids on blocks of 1,000 and 1,500 cars were received from the St. Louis Car Company, being \$28,625,000 and \$43,612,500 respectively.

Decision on the number of cars to be ordered has not yet been made by the Board of Transportation, but it is reported that the American Car & Foundry probably will receive the contract if less than 1,000 cars are ordered.

Board of Transportation engineers calculate that the contract awards on the basis of the lowest bids would provide 300 fully equipped cars for \$8,546,400, or \$28,488 per car, as compared with \$11,376,397, or \$37,921 per car, for the order of eighteen months ago.

South American Bus Market Beckons Manufacturers

A promising future market in South America for American trucks and buses is indicated by a survey of the automotive division of the Commerce Department. Despite the world depression, truck and bus registrations in South America have trebled during the last five years. Figures show that the American automotive industry has supplied from 90 to 95 per cent of the total number of these vehicles.

At the close of 1922 there were 5,078 trucks and buses in operation in South America. By the end of 1924, this number increased to 14,678. The next two years proved to be the turning point in commercial vehicle development. At the end of 1926 more than 56,000 commercial vehicles were registered. In 1928, the total registration had increased to 134,000, and in 1929 it rose to 174,000. By the end of 1930, the figure was 182,000.

Argentina and Brazil account for 78 per cent of the total number of trucks, having a total of 171,000. Chile, with 10,632 trucks, and Uruguay, with 9,330, are next in importance. The number of buses in operation at the end of 1930 was 10,623, with 2,800 in Argentina, 1,500 in Brazil, 1,500 in Venezuela, 1,475 in Chile, and 1,250 in Colombia. The remainder were distributed in smaller amounts in the other countries.

Foreign trade advisers report that despite progress in recent years much remains to be done in highway construction in South America. The total road mileage for the continent is insignificant when compared to the 3,000,000 miles in the United States. It is estimated that nearly half of the road mileage in South America is in Argentina, with Brazil having about one-fourth. Because of the unfavorable economic situation the 1931 highway programs have been generally trimmed.

\$2,500,000 for Mechanical Parts of Pennsylvania Locomotives

Orders for the construction of the chassis and mechanical parts of 60 electric freight locomotives were announced by the Pennsylvania Railroad. Electrical equipment for these locomotives and for 90 electric passenger engines was ordered in the spring from the Westinghouse Electric & Manufacturing Company and the General Electric Company.

Construction and material costs for the 60 chassis ordered will approximate \$2,500,000. Parts included in this order consist of driving wheels, axles, trucks, frame and cab, and the structural parts in which the electrical apparatus will later be installed.

Of the locomotives ordered, 30 will be built by the Lima Locomotive Works at Lima, Ohio, 20 by the Westinghouse Electric & Manufacturing Company, Eddystone, Pa., and ten in the Pennsylvania Railroad shops, at Altoona, Pa.

Construction schedules call for deliveries on the 60 locomotives to begin in March of next year. It is anticipated that the 150 freight and passenger locomotives to be used in the New York-Washington electrification will be ready for operation in 1933.

Osgood Bradley Speeds Construction of Subway Cars

The recent order for twenty cars obtained by the Osgood Bradley Car Corporation from the Ferrocarril Terminal Central de Buenos Aires, Argentina, will be completed by Dec. 1. Details of design and the specialties to be used have been settled, and the construction work is now progressing rapidly.

Motors and control equipment will be supplied by the General Electric Company, each car having two 125-hp. motors, inside hung. Westinghouse Air Brake Company will supply the air brakes and compressors, and the National Pneumatic Company the door mechanisms. The exterior finish will be Dulux, and the interior trim and headlining of aluminum alloy. Seating capacity is 47 and the total weight is 72,000 lb.

The cars will be used in the operation of the new subway now under construction.

J. G. Brill Completes Delivery of 40 Cars

During the past month the J. G. Brill Company has made deliveries of ten cars to the Philadelphia & Western Railway, and 30 cars to the Cia Chilena de Electricidad, Ltd., of Santiago, Chile.

The Philadelphia & Western Railway cars are for high-speed interurban service, and have a capacity of 56 seated passengers. These cars have an over-all length of 55 ft. 2 in. The total weight has been held down to 52,290 lb. by aluminum body construction.

The South American cars are of the two-man, double-truck type, with a seating capacity of 36. These cars will be operated in city service. Motors and control for both orders were furnished by the General Electric Company. The body is all steel, making the total weight of the car 32,500 lb. Doors are of the end folding type, with Consolidated Car Heating Company mechanism.

Specification details for the Philadelphia & Western cars:

Number of units.....	10
Type of unit.....	One-man, motor, passenger, interurban, double end, double truck
Number of seats.....	56
Date of order.....	6/22/31
Date of delivery.....	9/10/31
Weights: Car body.....	21,330 lb.
Trucks.....	16,000 lb.
Equipment.....	14,960 lb.
Total.....	52,290 lb.
Bolster centers.....	34 ft. 0 in.
Length over all.....	55 ft. 2 in.
Length over body posts.....	37 ft. 8 in.
Truck wheelbase.....	6 ft. 6 in.
Width over all.....	9 ft. 2 1/2 in.
Height, rail to trolley base.....	10 ft. 6 1/2 in.
Window post spacing.....	2 ft. 9 in.
Body.....	Aluminum
Roof.....	Oregon fir, arch
Doors.....	Plymell end
Air brakes.....	Westinghouse Air Brake, straight air emergency with safety control
Armature bearings.....	Sleeve
Axles.....	Annealed steel
Car signal system.....	Westinghouse Pneuphonic horn
Compressors.....	General Electric, 127-B-9
Conduit.....	Flexible
Control.....	General Electric, P.C.-12-N.
Couplers.....	Tomlinson, Form 16
Curtain fixtures.....	Adams & Westlake, red No. 65
Curtain material.....	Pantasote
Door mechanism.....	National Pneumatic Co.
Doors.....	Folding
Fare boxes.....	Ohmer, portable
Finish.....	Aluminum (Dulux)
Floor covering.....	Double thickness, Oregon fir
Gears and pinions.....	General Electric, heat treated
Glass.....	Libby-Owens non-shatterable in side saeb.
Du-plate non-shatterable in vestibule and doors	
Hand brakes.....	Peacock staffless
Hand straps.....	Stainless steel tubing
Heat insulating material.....	Armstrong Cork Co.
Heaters.....	Consolidated Car Heating Co.
Headlights.....	Ohio Brass, special 12, SDF type
Headlining.....	Aluminum
Interior trim.....	Chromium plated
Journal bearings.....	Sleeve
Journal boxes.....	Brill, semi-steel
Lamp fixtures.....	Adams & Westlake, No. 26-A-30
Motors.....	Four General Electric, 706-B, inside hung
Painting scheme.....	Maroon and tan, DuLux
Roof type.....	Arch
Roof material.....	Oregon fir
Safety car devices.....	Dead man feature with door and brake interlock
Sash fixtures.....	Adams & Westlake, stainless steel
Seats.....	Brill, No. 202-F
Seat spacing.....	2 ft. 9 in.
Seating material.....	Leather
Slack Adjusters.....	American Brake Co.
Steps.....	Stirrup
Step treads.....	Aluminum, anti-slip
Trucks.....	Brill, 89-E-2
Ventilators.....	Brill, automatic
Wheels.....	Rolled steel, diameter 28 in.
Special devices.....	Mirror on each end. Crew Signal System, Faraday single stroke bell, storage battery. Exide Ironclad KKK-9, Pyrene fire extinguishers.

Bus Deliveries

Baltimore Coach Company, Baltimore, Md., ten A.C.F., 29-passenger, street car type.

Brooklyn Bus Corporation, Brooklyn, N. Y., 60 Twin Coach, 50 Model 40, and ten Model 30.

Columbia Railway, Gas & Electric Company, Columbia, S. C., two Twin Coach, Model 30.

Connecticut Company, Hartford, Conn., nine Yellow Coach, 38-passenger, city type.

Eastern Massachusetts Street Railway, Boston, Mass., ten Twin Coach, eight Model 30, and two Model 40.

Los Angeles Railway, Los Angeles, Cal., seven Yellow Coach, 25-passenger, city type.

Middlesex & Boston Street Railway, Newtonville, Mass., four White, Model 64A.

Pacific Electric Railway, Los Angeles, Cal., seven Yellow Coach, 25-passenger, city type.

Reading Transit Bus Company, Reading, Pa., two Twin Coach, Model 30.

St. Joseph Railway, Light & Power Company, St. Joseph, Mo., two Mack, 21-passenger, city type.

Syracuse Railway Co-ordinated Bus Line, Syracuse, N. Y., six Twin Coach, Model 30.

Third Avenue Railway, New York, N. Y., ten White, Model 54A.

United Railway & Electric Company, Baltimore, Md., ten Yellow Coach, 33-passenger, city type.

West Ridge Transportation Company, Girard, Pa., one A.C.F., 25-passenger, parlor type.

Worcester Consolidated Street Railway, Worcester, Mass., ten Yellow Coach, seven 38-passenger city type, and three 29-passenger, city type.

Brooklyn Bus Corporation Orders 50 Mack Buses

Brooklyn has placed with Mack Trucks, Inc., an order for 50 buses of the Model BT, Metropolitan type. The bus has a 43-passenger capacity and is powered with a six-cylinder, 126-hp. Mack engine. Deliveries of this order, which is said to approximate \$600,000, are expected to be completed within three months.

This order increases the number of buses ordered by the Brooklyn Bus Corporation to 200. The Twin Coach Corporation received orders for the first 150 buses and has already delivered a large portion of the order.

The Mack order is for a street car type bus, with a center-exit door, and a front-entrance door just ahead of the front wheel. The doors will each have a width of 46 in. to permit two streams of passengers to board or alight.

Material Prices

OCTOBER 2, 1931

Metals—New York

Copper, electrolytic, delivered, cents per lb.	7.00
Lead.....	4.23
Nickel, ingot.....	35.00
Zinc.....	3.95
Tin, Straits.....	22.20
Aluminum, 98 to 99 per cent.....	22.90
Rabbitt metal, warehouse	
Commercial grade.....	34.75
General service.....	29.00

Track Materials—Pittsburgh

Standard steel rails, gross ton.....	\$43.00
Track spikes, 1/2-in. and larger, per 100 lb....	\$2.70
Tie plates, steel, cents per 100 lb.....	1.95
Angle bars, cents per 100 lb.....	2.75
Track bolts, per 100 lb.....	3.90
Ties, 6m x 8m x 8 ft.,	
White Oak, Chicago.....	1.05
Long leaf pine, New York.....	1.00

Waste—New York.

Waste, wool, cents per lb.....	11.00
Waste, cotton (100 lb. bale), cents per lb.:	
White.....	6.50-9.00
Colored.....	5.50-8.00

Wire—New York

Bare copper wire, cents per lb.....	9.00
Rubber-covered wire, No. 14, per 1,000 ft....	\$3.75
Weatherproof wire base, cents per lb.....	11.00

Paint Materials—New York

Linseed oil (5 bbl. lots), cents per lb.....	8.20
White lead in oil (100 lb. keg), cents per lb..	13.25
Red lead in oil.....	14.75
Turpentine (bbl. lots), cents per gal.....	38.00
Putty, com'l grade, 100 lb. tubs, cents per lb.	5.50

Hardware—Pittsburgh

Wire nails, per keg.....	\$1.90
Sheet iron (24 gage), cents per lb.....	2.40
Sheet iron, galvanized (24 gage), cents per lb.	2.90
Auto body sheets (20 gage), cents per lb.....	3.10
Fender stock (20 gage), cents per lb.....	3.20

Bituminous Coal

Pittsburgh mine run, net ton.....	\$1.35
Central Ill. screenings.....	1.00
Kansas screenings, Kansas City.....	1.10
Big seam, Ala., mine run.....	2.15
Smokeless mine run, Chicago.....	1.90

Paving Materials

Paving stone, granite, 5 in., f.o.b.:	
New York—Grade 1, per thousand.....	\$120.00
Wood block paving 3 1/2, 16 lb. treatment, N.Y., per sq. yd., f.o.b.....	2.00
Paving brick, 3 1/2 x 8 x 4, N.Y., per 1,000 in. carload lots, f.o.b.....	50.00
Paving brick, 3 x 8 x 4, N.Y., per 1,000 in. carload lots, f.o.b.....	45.00
Crushed stone, 1-in., wholesale, f.o.b. per cu. yd.....	1.80
Cement, Chicago, in carload lots, without bags, delivered.....	1.95
Gravel, 1-in., cu. yd., wholesale, f.o.b.....	1.60
Sand, cu. yd., wholesale, f.o.b.....	1.00
Asphalt, in pkg. N.Y., f.o.b. ref., per ton....	16.00

Scrap—New York

Heavy copper, cents per lb.....	5.00
Light copper.....	4.15
Heavy brass.....	2.60
Zinc.....	1.50
Lead, heavy.....	3.00
Mixed babbitt.....	3.25
Battery lead plates.....	1.20
Cast aluminum.....	4.75
Sheet aluminum.....	8.25
Auto radiators.....	2.80
Tires, standard, mixed, per ton.....	\$3.00
Inner tubes, mixed, per cwt.....	\$1.20

Old Material—Chicago

Steel car axles, net ton.....	\$11.75
Cast iron car wheels, gross ton.....	9.75
Steel car wheels, gross ton.....	9.00
Leaf springs, cut apart, gross ton.....	10.00
Angle bars, gross ton.....	9.50
Brake shoes, net ton.....	6.00
Steel rails (short), gross ton.....	11.25
Relaying rails, gross ton (65 lb. and heavier)	24.50
Machine shop turnings, gross ton.....	4.25
Coil springs, per gross ton.....	10.25
Frogs, switches and guards cut apart, per gross ton.....	8.25

Conspectus of Indexes for September, 1931

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last Five Years	
				High	Low
Street Railway Fares* 1913 = 4.84	Sept., 1931 7.81	Aug., 1931 7.81	Sept., 1930 7.78	July, 1931 7.81	Sept., 1926 7.35
Electric Railway Materials* 1913 = 100	Sept., 1931 116	Aug., 1931 113	Sept., 1930 133	Dec., 1926 159	Aug., 1931 113
Electric Railway Wages* 1913 = 100	Sept., 1931 232.9	Aug., 1931 232.9	Sept., 1930 231.8	April, 1931 233.2	Sept., 1926 226.1
Electric Ry. Construction Cost* Am. Elec. Ry. Assn. 1913 = 100	Sept., 1931 167	† Aug., 1931 167	Sept., 1930 196	Nov., 1928 206	Aug., 1931 167
General Construction Cost Eng'g News-Record 1913 = 100	Sept., 1931 171.4	† Aug., 1931 171.4	Sept., 1930 199.6	Jan., 1927 211.5	Aug., 1931 171.4
Wholesale Commodities U. S. Bur. Lab. Stat. 1926 = 100	Aug., 1931 70.2	July, 1931 70.0	Aug., 1930 84.0	Sept., 1928 100.1	June, 1931 70.0
Wholesale Commodities Bradstreet 1913 = 9.21	Sept., 1931 8.49	Aug., 1931 8.79	Sept., 1930 10.42	Jan., 1928 13.57	Sept., 1931 8.49
Retail Food U. S. Bur. Lab. Stat. 1913 = 100	Aug., 1931 119.7	July, 1931 119.0	Aug., 1930 143.7	Dec., 1926 161.8	June, 1931 118.3
Cost of Living Nat. Ind. Conf. Bd. 1923 = 100	July, 1931 85.9	June, 1931 85.9	July, 1930 95.2	Nov., 1926 104.0	June, 1931 85.9
General Business The Business Week Normal = 100	Sept. 5, 1931 72.5	Aug. 8, 1931 73.4	Sept. 6, 1930 83.5	Oct. 6, 1928 117.6	Aug. 29, 1931 71.0
Industrial Activity Elec. World, kw.-hr. used 1923-25 = 100	Aug., 1931 97.3	July, 1931 97.9	Aug., 1930 105.3	Feb., 1929 140.4	Aug., 1931 97.3
Bank Clearings Outside N. Y. City 1926 = 100	Aug., 1931 66.0	July, 1931 68.6	Aug., 1930 86.9	Oct., 1929 111.8	Aug., 1931 66.0

*The four index numbers marked with an asterisk are computed by Mr. Richey. Fares index is the average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation

and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 115 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.
† Revised.

IN 1930-31

(JULY TO JULY)

5 , 5 0 0 , 0 0 0 , 0 0 0

**PASSENGERS CARRIED
WITH ONLY 9 FATALITIES**



*Most of the trolley-cars
are Peacock Staffless
Brake equipped . . . !*

How About Yours?

SAFETY - SPEED - CERTAINTY

National Brake Company

890 Ellicott Square, Buffalo, N. Y.

Canada:—Lyman Tube & Supply Co., Ltd., Montreal

The Ellicott Co., General Sales Representative, 50 Church Street, New York City



K 28

for 28° bevel mountings
 Sizes: 5", 6", 7", 8"
 and 9-10"

Modern pneumatic truck tires — regardless of make — need a modern rim which makes tire changing quick and easy.

Let your eye follow that arrow, and you will see how Goodyear builds the rim which meets this need — a split base rim with continuous ring and open end valve slot—a rim that takes the fight out of tire changing.

You can use Goodyear K Rims straight through your fleet — on large wheels or small ones. They mean greater speed in mounting tires or taking them off — as well as safety, lightness with strength, and are fully interchangeable. Find out all the advantages — and savings — specify K Rims — write to Rim Department, The Goodyear Tire & Rubber Company, Inc., Akron, Ohio.

"THE MAN WHO CHANGES THE TIRES LIKES 'K' RIMS"

GOODYEAR

K-28

RIMS

K-18

**"GOODYEAR TIRES
ARE THE ONLY TIRES
TO USE IN OUR TYPE
OF SERVICE"**

—says Tanner Motor Tours

Forty coaches comprise the sightseeing fleet of Tanner Motor Tours, Los Angeles, California. For 5 years, they have used Goodyear Tires exclusively



WHERE distances are great and safety must be combined with dependable performance . . . Goodyear Tires are the only tires for our type of service." *These statements are taken straight from a letter written by Tanner Motor Tours. "In your All-Weather Tread we get sure-footed safety that is so important, particularly over mountain roads. The Supertwist cord, too, gives extra resilience and vitality so that delays in our schedules have been practically unknown. That is why, for the past five years, we have been using Goodyear Tires exclusively."*

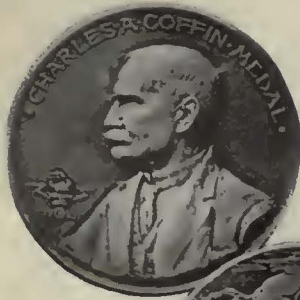
Isn't that a good reason why your fleet also should be on Goodyears?



THE GREATEST NAME IN RUBBER

GOODYEAR

IT PAYS TO SPECIFY GOODYEARS WHEN YOU ORDER NEW COACHES



MILWAUKEE WINS - - AND THERMIT ALSO



Wells Street, Milwaukee, between 28th Street and 33rd Street. This photograph shows excellent condition of track and pavement six years after laying.



Greenfield Ave., Milwaukee, nine years after laying of track and paving.

The

METAL & THERMIT

120 Broadway, New York, N. Y.

Pittsburgh

Chicago

Albany

So. San Francisco

Toronto

SCORES AGAIN!

7 out of 9

"MORE REVENUE FROM MORE RIDERS" *The Milwaukee Way!*

• This was the principal theme in the Milwaukee Brief! Everything possible to make riding attractive! A fare system to appeal to the pocket-book! Rolling stock that is modern and comfortable! . . . And track that is smooth riding and quiet.

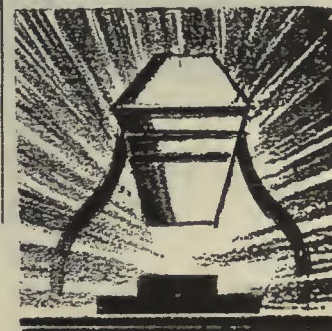
Milwaukee was one of the early users of Thermit! Since 1915, they have been steadily adding to the number of Thermit welded joints.

Now 70% of all track of this Company, located in paved streets, is Thermit welded.

One of the "accomplishments" cited in the Milwaukee Brief for the Coffin Award is their recent adoption of the new method—"Thermit-Welding-Under-Traffic." Here it what they say it does—(1) eliminates night-work; (2) obtains better workmanship in daylight; (3) decreases hazards of night-work; (4) effects savings by welding joints as soon as rails are cut-in to the track, instead of placing temporary paving, and re-opening at night. When rails are cut-in several days in advance of welding, the track foundation may be loosened and damaged before the welds are applied.

COFFIN AWARDS Since 1923 Users of Thermit Welding are marked with check ✓

✓	1923	CHIC., NO. SHORE & MILW. R.R.
	1924	NORTHERN TEXAS TRACTION CO.
✓	1925	PITTSBURGH RAILWAYS COMPANY
✓	1926	PENNSYLVANIA-OHIO ELECTRIC CO.
✓	1927	GRAND RAPIDS RAILROAD CO.
✓	1928	VIRGINIA ELEC. & POWER CO.
	1929	CHIC., SO. SHORE & SO. BEND R.R.
✓	1930	YOUNGSTOWN MUNICIPAL RY. CO.
✓	1931	MILW. ELEC. RY. & LIGHT CO.



CORPORATION

120 Broadway, New York, N. Y.

Pittsburgh Chicago Albany So. Francisco Toronto

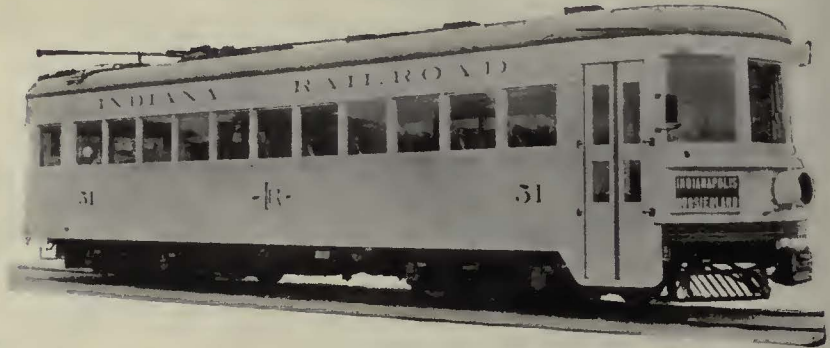
35 INDIANA SERVICE CORPORATION NEW LIGHT WEIGHT CARS

EQUIPPED WITH

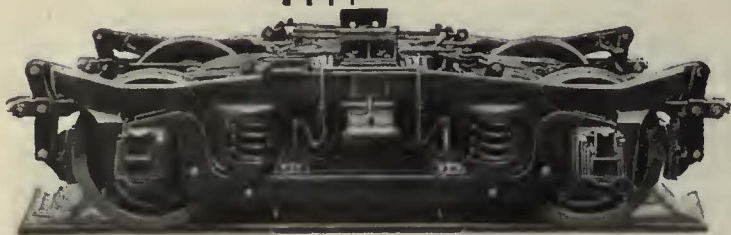
Commonwealth Trucks

"EQUALIZED SWING MOTION TYPE"

These high-speed interurban passenger cars are an outstanding example of modern engineering. They are equipped with Commonwealth light weight equalized swing motion trucks, the frame including pedestals, likewise the bolster and spring plank being integral steel castings.



Commonwealth trucks are a most important factor in making possible an unusually high-speed schedule. These trucks provide for the utmost in riding comfort, maximum of safety and lowest possible maintenance costs. Investigate their possibilities for your service.



GENERAL STEEL CASTINGS
CORPORATION

EDDYSTONE, PENNA.
GRANITE CITY, ILLINOIS

98,000 MILES PER EXIDE



"We are highly pleased with the service and economy made possible by Exide Batteries"—Reading Transportation Company. Let us show you how to get lowest cost per bus mile.

GIVE LOWEST COST PER BUS MILE

THAT is the average service Reading Transportation Company (Reading Railroad) get from their Exide Motor Coach Batteries—89 buses now in use—4,000,000 miles operated in the past year—proper maintenance an important factor.

The experience of the Reading Transportation Company is only one of the many proofs that Exides give lowest cost per bus mile. It's the built-in dependability, uniform rugged construction, plus proper maintenance that makes Exide Batteries cost least per mile. There are no weak spots in an Exide . . . rebuilding is not necessary. This battery is in your bus till it wears out, and it gives you reliable performance all the way.

Of course you want to keep maintenance figures from piling up. The question is, "How?" Our extensive engineering experience enables us to show you how to get lowest cost per bus mile. Don't hesitate to make your problem ours. We want to serve you as well as sell batteries. To show you that, while first cost is slightly more, Exides cost least in the long run. Write today for facts. No obligation.



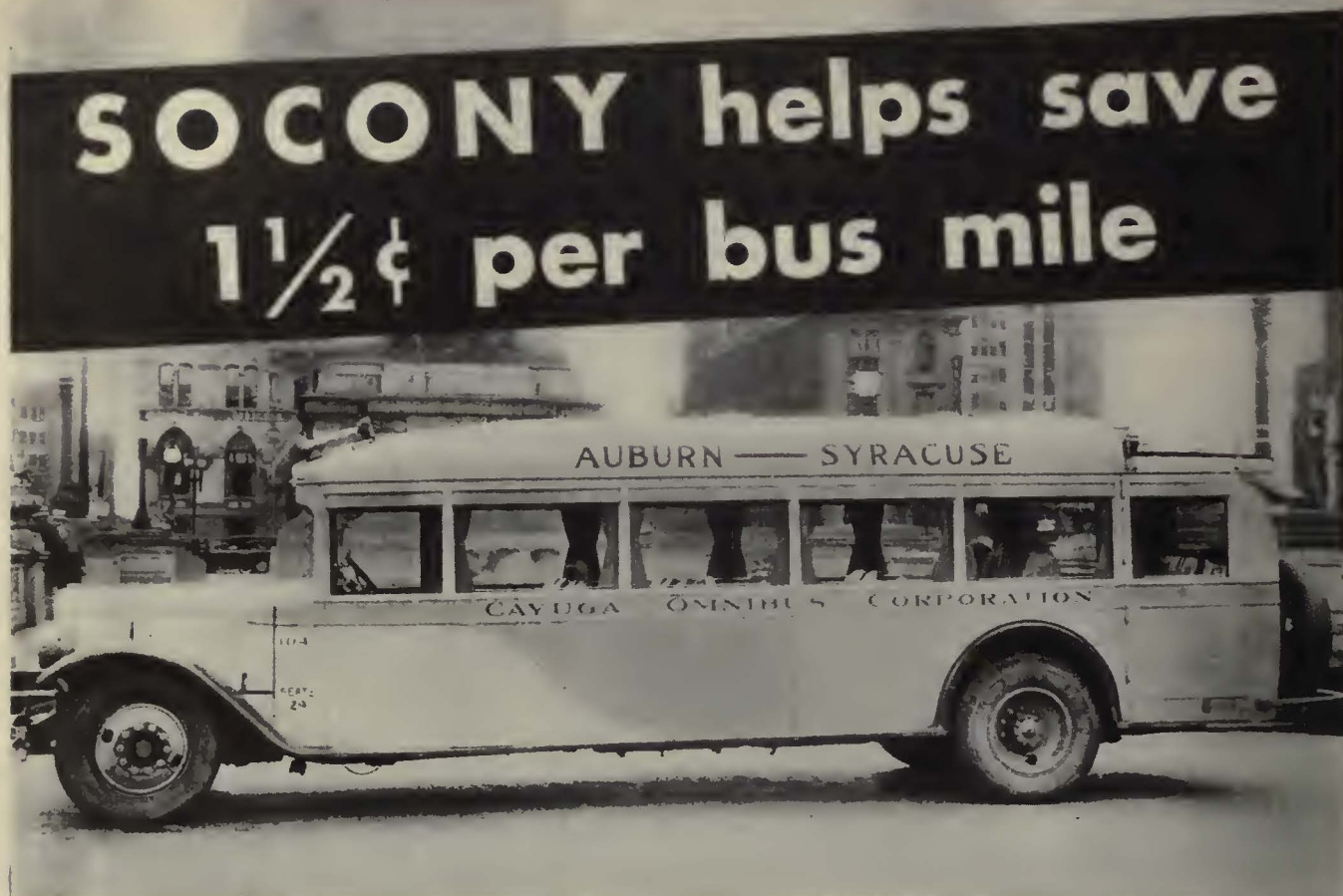
The Exide Motor Coach Battery—long-lived dependable, economical.

Exide

**MOTOR COACH
BATTERIES**

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
THE WORLD'S LARGEST MANUFACTURERS OF STORAGE BATTERIES FOR EVERY PURPOSE

Exide Batteries of Canada, Limited, Toronto



One of the Socony fueled and lubricated buses operated by the Cayuga Omnibus Corporation between Auburn and Syracuse, N. Y. This company also operates buses in Auburn and the surrounding territory.

FROM 22.3¢ per bus mile to 20.8¢ per bus mile . . . that's the reduction made in operating expenses since Socony has been fueling and lubricating the twenty-one buses of the Cayuga Omnibus Corporation operating in the city of Auburn, New York, and in the immediate vicinity. Also—the buses have turned in better service records with less time out for repairs

since Socony was put on the job, fulfilling the company's motto, "Intelligent Transportation."

For low-cost, efficient operation, you will find that Socony products fuel and lubricate your fleet most satisfactorily. That's so whether you operate six buses or sixty, and whether you run them ten miles a day or one hundred.

SOCONY

BANNER GASOLINE SPECIAL GASOLINE plus ETHYL 
SOCONY DE-WAXED MOTOR OIL

STANDARD OIL COMPANY OF NEW YORK



FROM CALIFORNIA TO SOUTH AFRICA . . .

MASTIPAVE

adds years of life to street car floors . . .

Durban, South Africa, says:* After 2700 miles, carrying 423,000 passengers, "no signs of wear whatever" . . . "maintenance cost nil" . . . "cars cleaned in one-third of the time" . . . "easier on conductors' feet" . . . "continuing to cover all cars."

In San Francisco a similar story. And wherever MASTIPAVE is used! Street cars, factories, railroads, schools, hospitals, offices. **Any** floor or stairway that must withstand heavy traffic. Will even outwear steel treads.

MASTIPAVE is very low in cost and extremely durable. Waterproof, rot-proof, vermin proof. Non-slip even when wet. Resilient, quiet. Write for free booklet.

** Name on request*

THE PARAFFINE COMPANIES, INC.
475 BRANNAN STREET, SAN FRANCISCO

THE COTT-A-LAP COMPANY
SOMERVILLE, NEW JERSEY

Offices in Principal Cities

Manufacturers of Pab-Cate, Pabco Multi-Service Paints, Varnishes, Lacquers and Enamels, Pabco Waterproofing Points and Compounds, Mastipave, Pabca 10, 15 and 20 Year Roofs, Malthoid Membrane Dampcourse, Pabcoband and Other Products

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**THE LOW-COST
LONG-LIFE
FLOOR COVERING**

• PABCO MASTIPAVE •

MORE *and* **MORE** **OPERATORS**



21-PASSENGER CITY TYPE COACH



21-25 PASSENGER PARLOR COACH

1-Prefer these sizes

2-Prefer Fargo Coaches in these sizes

More and more operators are showing a preference for these sizes on many routes for reasons of greater economy and greater adaptability. And more and more operators are selecting Fargo Coaches for the following reasons:

BECAUSE the City Type, with seats for 21 passengers and aisle and loading well space for upwards of 40 standees, provides the increased capacity needed for the peak hours.

BECAUSE circulating load features in the City Type assure rapid passenger movement.

BECAUSE the 21-25 passenger Parlor Coach, with reclining seats, provides ample capacity for average inter-city service.

BECAUSE these coaches . . . with a wheelbase of 172 inches . . . provide the greatly desired flexibility in traffic and the interior roominess usually available only with a much longer wheelbase.

BECAUSE each coach is modern through and through—with its economical 120-horsepower 8-cylinder engine that is readily accessible or quickly removable; full-floating worm-drive rear axle; 10" double-drop frame; unusually short turning radius; internal hydraulic 4-wheel brakes with booster; 10¾-gallon cooling system; and many other features whose advantages have been amply proved by exacting operators for hundreds of thousands of revenue miles.



FARGO MOTOR CORPORATION, DETROIT, MICHIGAN
DIVISION OF CHRYSLER CORPORATION

For low cost-per-mile For trouble-free service For Safety

It is significant that Bethlehem Wrought Steel Wheels are so widely used on electric railways. Significant, because there is no more severe service demanded of wheels than that resulting from today's higher speeds, and the much quicker starting and stopping of cars. Only wheels of high character can stand up under the extremely heavy traffic of modern cities and their suburbs.

Bethlehem Wrought Steel Wheels have strength, endurance and wearing qualities worked into them during the process of manufacture. Five distinct forging and rolling operations are required to make a Bethlehem Wheel. The forging gives the metal density and toughness. The rolling establishes a refinement of grain structure, with a corresponding increase in strength and ductility. Each wheel is carefully inspected at every step throughout the process of manufacture.

If you investigate these wheels you will learn, as so many other electric railway executives have learned: that for trouble-free service, for safety, for low cost-per-mile, Bethlehem Wrought Steel Wheels are unsurpassed.

BETHLEHEM STEEL COMPANY



General Offices: BETHLEHEM, PA.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Buffalo, Pittsburgh, Cleveland, Cincinnati, Detroit, Chicago, St. Louis.

Pacific Coast Distributor: Pacific Coast Steel Corporation, San Francisco, Los Angeles, Seattle, Portland, Honolulu.

Export Distributor: Bethlehem Steel Export Corporation, 25 Broadway, New York City

BETHLEHEM

Wrought Steel Wheels



Be Prepared . . . change to the correct winter grade of **KOOLMOTOR OIL** the perfect Pennsylvania Motor Oil

THIS Winter protect your heavy-duty, high-powered bus engine—and your profits—against the wear, tear and expense of hard starting. Prevent undue, costly strain on your batteries and starting mechanism by using KOOLMOTOR Oil—the ideal Winter lubricant.

This special *low cold-test* oil flows freely at the touch of the starter—distributes quickly

to moving surfaces—eliminates the drag of slow starting.

And remember the fact that KOOLMOTOR Oil *cools* as it lubricates. This cooling feature is equally as important to your hot running bus engines in Winter as in Summer—combustion temperatures are the same inside your engine irrespective of whether outside conditions are warm or cold.

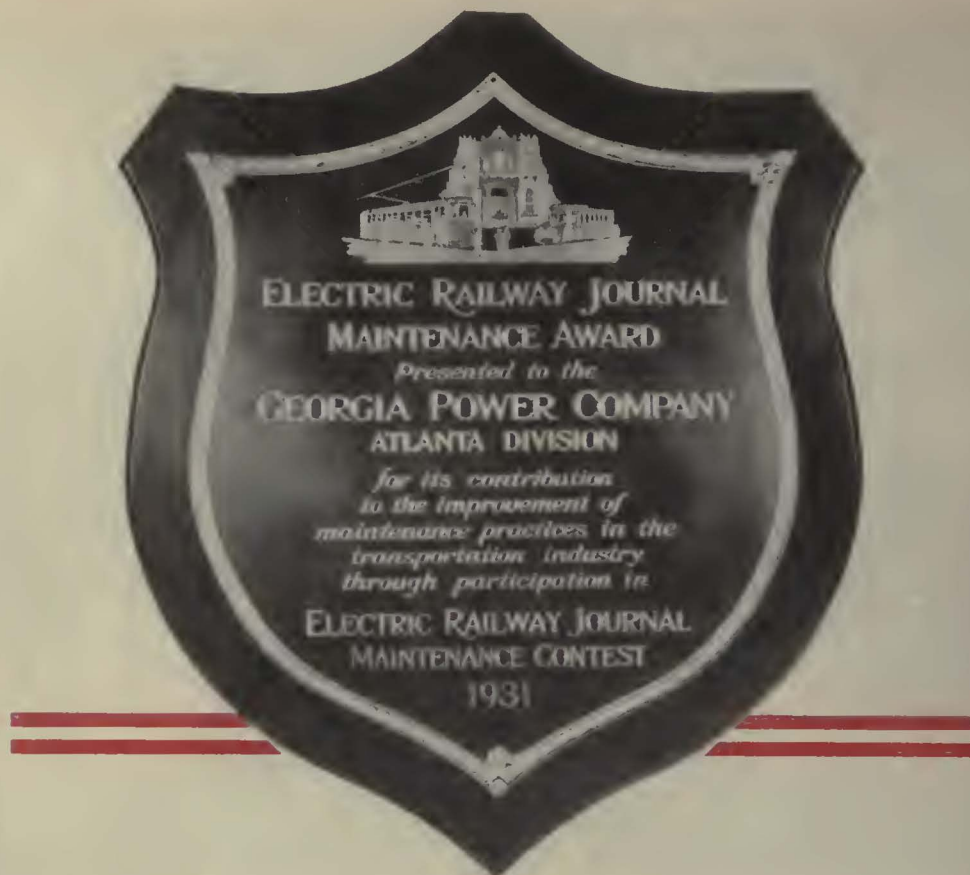
Cold days are coming—be prepared! Order your Winter's supply of KOOLMOTOR now.

Write to CITIES SERVICE
60 Wall Street • New York



Cities Service Radio Concerts
Fridays, 8 P. M., Eastern Standard Time, WEAJ and 36 Associated Stations on N. B. C. Coast-to-Coast Network—Cities Service Orchestra, Cavaliers and Jessica Dragonette.

Cities Service Oils and Gasolene



THE
NOVEMBER NUMBER
OF
ELECTRIC RAILWAY JOURNAL

will illustrate and describe the maintenance methods and equipment used by the Georgia Power Company in obtaining the remarkable results that won this Award.

Special articles in the November Number will be devoted to this subject, analyzing in detail the maintenance methods and practices, and the equipment used by the winning company, such as rolling stock and shops, way and structures, overhead lines, buses, materials, parts and supplies.

In the advertising pages of that Number, additional information will be found in the advertisements of leading manufacturers, displaying and explaining the details of their latest products.

The November Number will be mailed to subscribers November 5. Advertising forms will close October 23.

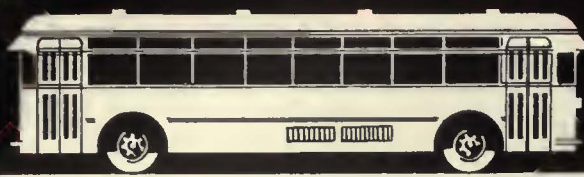
*Cuts and copy should be sent to Electric Railway Journal,
330 West 42d Street, New York City, N. Y.*

NEVER BEFORE . . .
Such a bus at such a price



Six Cylinder Model Weighing 5500 Pounds « « « \$3500 f. o. b. Kent, Ohio
MODEL "15" 17 PASSENGER





THE MOST TALKED ABOUT

TWIN COACH builds vehicles to meet a problem. This is the history of the institution and of the man, Frank R. Fageol. It is the secret of any success we have in the transportation field.

In 1922 there was a real demand for a low hung, swift moving coach for the development of commercial transportation on the great highway system which the private automobile had been instrumental in developing.

Thereupon Fageol presented his famous Safety-Coach, which really sponsored highway passenger transportation as we know it today.

In 1927 the Urban Street Railway executives were looking for a motor coach with body and loading arrangements similar to those of the rail trolley car upon which they had built their business for the previous 30 years.

Thereupon Twin Coach offered the successful and standardized 40 passenger Twin Coach with dual motors, today by far the largest seller in its class.

Right now scores of operators in the railway and inter-city bus field are seeking the other extreme, a thoroughly reliable small coach built of genuine motor bus parts and at a list price not to exceed \$3,500.00 fully equipped. They have been in many instances trying to meet their needs with converted general purpose automotive truck or pleasure car chassis, bearing locally built utility bodies.

Neither the patron nor the operator has been happy with such equipment.

Based upon the actual economics of the situation facing the operator and from the wealth of bus engineering experience we now offer for this recently arisen situation the Model 15 Twin Coach.

It is built really to fill the schedules of franchise lines where service must be rendered for policy reasons, whether there is a profit or not; it is built

to carry 17 seated passengers plus quite a few standees, providing for them roomy quarters, full head room, touring car riding comforts and quick passage due to surplus power and the maneuverability in traffic which comes with a 132" wheel-base and a 69" width—plus a driver out in front.

There is something about the low hung appearance of this unit that gives it a fascinating and inviting appearance as far as the prospective customers on the curb are concerned. It has but one step of entry, 12" in height, and the floor level inside the vehicle maintains this height, giving with the wide door an unusually quick loading and unloading arrangement.

The unit is built of the best materials we can buy, all metal with body sides and roof of duralumin. Powered with 6-cylinder Twin Coach designed engine (built by Hercules) mounted on rubber, it offers a tough resistance to hard service in outlying districts with questionable road surfacing. Furthermore it asks remarkably little in the way of maintenance, including gas and oil. In fact the unit shows quality manufacture in every appointment; even to hardware, interior trim, painting and seat structure.

We do not believe this vehicle could be built at the price except under a manufacturing policy like our own where we purposely build a standardized line of vehicles placing ourselves in a position to utilize materials purchased on the basis of interchangeability between models. Every part in this vehicle, except for proportion, has stood the test of service in the hundreds of Twin Coach units already on the road in gruelling "stop and start" service.

As remarked heretofore, in producing this unit we go from the extreme of our success with the large 40-passenger vehicle to the building of this new small transportation tool, because the success of our institution we believe always will lie in our ability and readiness to meet the situation facing the customer.



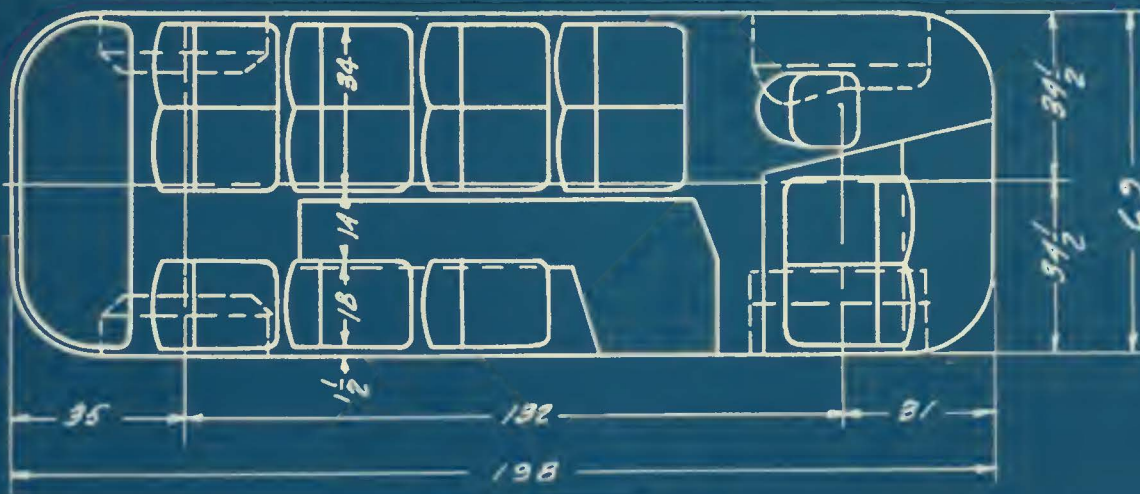
VEHICLE AT ATLANTIC CITY

MODEL "15"

17 PASSENGER



Seating Arrangement





General Specifications

All Twin Coaches Manufactured Under Patents Pending and Issued

Overall length with bumpers and visors.....	213 1/2"
Overall length without bumpers and visors.....	202 1/2"
Overall width.....	69"
Overall height (loaded).....	87 1/4"
Wheel Base.....	132"
Tread, Front and Rear.....	59 1/8"
Turning Radius, approx.....	21'
Body Overhang, Front.....	31"
Body Overhang, Rear.....	35"
Interior Head Room in Aisle.....	74"
Interior Head Room at Seats.....	65 1/2"
Road Clearance, minimum under rear axle.....	8"
Road Clearance, lowest point of body.....	10"
Maximum Body Clearance at Front End.....	11 3/4"
Maximum Body Clearance at Rear End.....	12"
Weight.....	5,500 lbs. (approx.)

GENERAL ASSEMBLY—Body and running gear structural framework all made out of steel, riveted together. Running gear consists of special shape brass steel channel cross members onto which spring brackets are mounted.

3/8"x1 1/4"x1 1/4" standard tee iron used for body structure extending from body rail to the roof and down to the other side in one piece, except at the end where short interconnecting members are employed. Window upper and lower headers consist of 3/8"x1 1/4"x1 1/4" angle iron, extended clear around body except that at the entrance and emergency doors the lower window headers are interrupted.

Body outside covering, including roof, roof corners and lower body, is of 1/8" thick heat-treated aluminum alloy sheet.

Flooring consists of 3/4" thick 7-ply Fir Plywood, specially treated for maximum serviceability. The floor is supported on body sides and at center by means of steel structural members. Floor finish consists of especially prepared plastic composition painted on. This gives a maximum durability and light weight, and is especially easy to maintain.

Glass is used clear around the body. The front corner sash hinge for ventilating purposes, while windshield glass is 1/4" laminated safety glass and stationary mounted.

Rear end full quarter corner glass is 1/4" plate, while rear end flat glass is 1/8" double strength, Grade "A," window glass.

The side windows are provided with heavy duty brass satin nickel finish lift sash, the detailed construction and installation of which is exactly the same as used on the Models 20, 30 and 40 coaches. The upper sash is interchangeable with the intermediate size of sash used on the Model 30.

The entrance door is just back of the right front wheel housing and consists of two leaf hinged door, one leaf of which is hinged out from each door post. The door construction consists of extruded aluminum covered by 1/8" thick heat-treated aluminum alloy sheet metal. The upper section of the door is paneled with 1/8" double strength window glass. Manual control is used for the door from the operator's seat.

EMERGENCY DOOR—Located on left side directly opposite service door, made out of dural structural members paneled on outside with heat-treated aluminum alloy sheet and equipped with raise sash on upper end to match other sash.

LIGHTS—Headlights, two Guide Tilt-Ray type 535 flush mounted.

Marker Lights, standard beehive 3" dia. mounted on each corner of roof.

Tail Light, Guide type 264 with Stop Light and License Plate Bracket built integral.

Interior Lights, Two, 5" frosted glass dome lights with 21 C. P. lamps.

Dash Light, one dash light at instrument panel.

BUMPERS—3/8" spring steel front and rear. These will be the same as delivery unit—(except wider).

VISORS—Sheet aluminum visors on front and rear ends.

ROOF DRAINAGE—Drip ledges provided above doors and windows.

INTERIOR FINISH—Hex. shape pilasters over window posts, between upper and lower window headers. 20 ga. sheet aluminum mounted to blocking with oval head wood screws above window upper headers. Provision for 11" advertising cards on each side.

SEATS—Seating capacity, 17 passengers, seated. Ample room in aisle for standees. Seats, chrome tan leather, semi-bucket type with sheet aluminum

backs and aluminum pedestals. Ample knee room provided throughout. Seating arrangement consists of four dual seats facing forward on left side. Three single seats facing forward on right side. One single seat facing toward rear over right front wheel housing and four passenger settee seats facing forward across rear end. Driver's seat at left front corner where maximum visibility is assured.

HEATING—Kysor Muffler Heater with two floor registers located under seats on left side.

Burgess Muffler used in back of Kysor heater muffler to get maximum silence in operation.

DESTINATION SIGN—Destination sign is located at front end over visor. Glass opening 5" high by 31 1/2" wide.

REAR VISION MIRROR—Rear vision mirror installation above driver, giving complete view of rear and interior.

PAINT SPECIFICATIONS—The same as on other coaches.

MECHANICAL UNITS—Springs—42" long, 2" wide, chrome vanadium steel. All springs are interchangeable. Large capacity rubber bushings used throughout requiring no lubrication. Snubbers consist of rubber block type clamped to springs with "U" bolts.

Front Axle—Timken drop-forged eye-beam section, No. 11706-2.

Rear Axle—Timken No. 51500 semi-floating gear type of conventional design. The standard ratio is 4 5/6 to 1.

Brakes—Four wheel internal expanding hydraulic brakes, 2 1/4" wide by 15" dia. Moulded brake lining and nickel cast iron drums. Emergency brake on transmission, manually controlled with hand lever at driver's right.

Steering Gear—Ross, Model 220 cam and lever type. Steering gear is located at left side ahead of front axle and connected to axle steering wheel with longitudinal ball joint type drag link. 18" wood steering wheel.

Engine—One Hercules, 6-cylinder engine at extreme front end center of body, housed off to give satisfactory dissipation of heat and minimum passenger and driver interference. Detachable "L" head aluminum piston No. 3 bell housing and with rubber mounting bushings pressed into sockets, cast integral in bell housing and gear case cover to provide the rubber cushioned four-point support. Engine has accessibility through top and motor housing and through removable shield on right front wheel housing. Bore and stroke, 3 3/4 x 4 1/4; 281.7 piston displacement; 33.75 N.A.C.C. rating; 73 H. P. at 2,800 R.P.M. 176' lbs. torque at 1,000 R.P.M. Force-Feed lubricating system through positive gear pump. External type oil filter. Zenith carburetor with Airmaze Cleaner. A C fuel pump, driven off camshaft. Delco-Remy Automatic Advance Distributor (the same as used on large coaches). D-R Starting Motor. D-R 6-volt generator.

Clutch—Extra large single disc type with J-M lining and nickel iron pressure plate. Oilless bronze pilot bearing. Clutch control consists of short remote linkage 2' pedal.

Self-operating Automatic Clutch optional at small additional cost.

Starter—Eclipse automatic.

Transmission—Brown-Lipe Model 30-C, equipped with heavy duty gears. Ratio 3.3 in low, 1.68 to 1 in second and 1.1 in high and 4.45 to 1 in reverse; equipped with standard speedometer drive take off and propeller shaft emergency brake. **Free-wheeling unit on rear of transmission.** Free-wheeling housing carries the emergency brake spider. Transmission shift control by means of conventional lever bent forward slightly to reach driver's seat.

Drive Shaft—Cleveland Steel Products No. 285 series with SKF self-aligning roller type midship bearing and SKF midship bearing housing in drive line (the rear drive shaft is the same as used on delivery unit).

Chassis Lubrication—Alemite throughout.

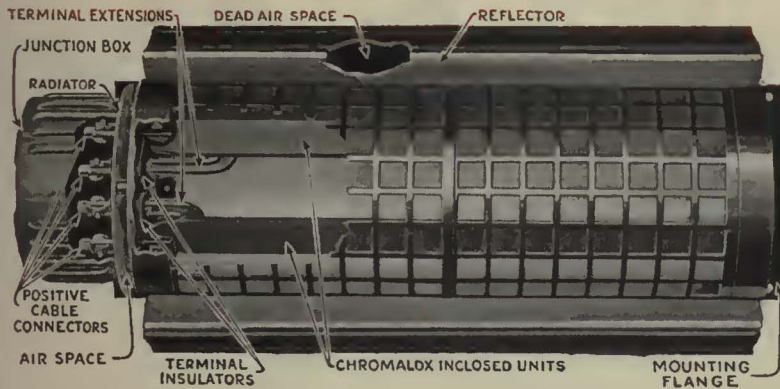
WHEELS—Twin Coach cast wheels, spoke type made by Dayton. Hubs cast integral front and rear. **TIRES**—Heavy duty balloon 7.50 x 18.

RIMS—Goodyear type "K." **SPARE TIRE CARRIER**—At rear end in vertical position against body panel, substantially mounted. **HORN**—6 volt vibrator type. **WINDSHIELD WIPER**—Folberth heavy duty, mounted on windshield side post. **BATTERY**—Exide, 3XER, 6 volt, rubber case with folding lift handles mounted at right front corner, very accessible. **SPEEDOMETER**—Driven from back of transmission. Stewart-Warner head mounted on instrument panel in front of driver. Flexible cable drive.

TWIN COACH CORPORATION, KENT, OHIO



Two Great Advances in Car Heating Equipment



“UTILITY”
Reflector
TYPE
Car Heater
WITH
Chromalox
Enclosed Units

- Gives Full Use of Electrical Energy Input.
- Directs Maximum Amount of Heat to Lower Part of Car.
- Heats the Feet and Not the Seat.
- The Greatest Improvement Ever Made in Electrical Car Heaters.

“UTILITY-ARCOSTAT” Temperature Control

- Regulates Within One Degree Fahrenheit of Any Predetermined Temperature.
- Permanent Operating Point.
- Highly Sensitive.
- In Actual Service, Through Two Heating Seasons, of 1197 Arcostats Tested and Examined, Only One Out of the Entire Lot Failed to Function 100 Per Cent.

Write at once for full information



Railway Utility Co.

Makers of Heating and Ventilating Equipment for Electric and Steam Railway Cars, Trackless Trolleys and Buses

2241 Indiana Avenue

Chicago, Illinois

FOUR MILLION MILES -



**ONLY
5 road delays!**

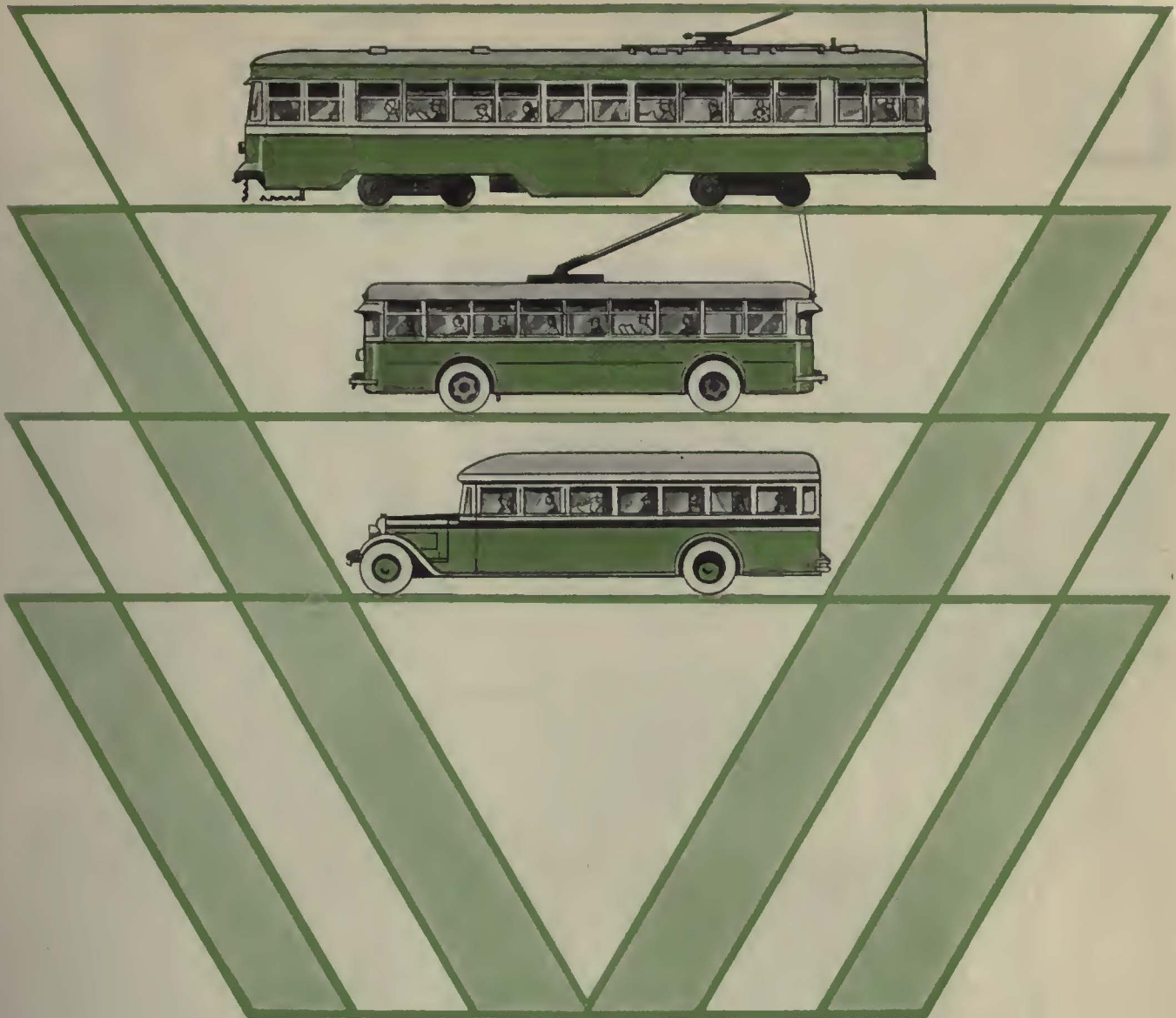
11,400 miles a day. Four million miles a year! Every one of these miles in the South, where summer heat puts an extra strain on tires. Yet under these gruelling conditions, the Camel City Coach Company, operating a fleet of seventy-five buses—HAD ONLY FIVE ROAD DELAYS FOR THE FOUR MILLION MILES! But let Mr. J. L. Gilmer, President of the Atlantic Greyhound Lines, Camel Coach Division, tell you about it:—"Even under the most severe conditions of road and weather," says Mr. Gilmer, "we have found Firestone Balloons, plus Firestone service, an unbeaten combination. As you can imagine, our adoption of Firestone has proven a very considerable operating economy in addition to increasing the traveling comfort of our passengers and the punctuality of our schedules."—Firestone Balloons for your trucks or buses SAVE you money; REDUCE your road delays. Your Firestone dealer nearby will be glad to tell you the whole story. When purchasing new equipment, be sure to ask for Firestone Balloons, Tubes, Rims, Batteries, Brake Lining and Accessories



Firestone

B U S B A L L O O N S

◀◀ LISTEN TO THE VOICE OF FIRESTONE EVERY MONDAY NIGHT OVER N. B. C. NATIONWIDE NETWORK ▶▶



Long-lived strength
unfailing efficiency
lowest center of gravity
permanent silence
these are combined only in
TIMKEN WORM DRIVE
for cars, trolley buses, coaches



THE TIMKEN-DETROIT AXLE COMPANY, DETROIT, MICHIGAN

LEA D E

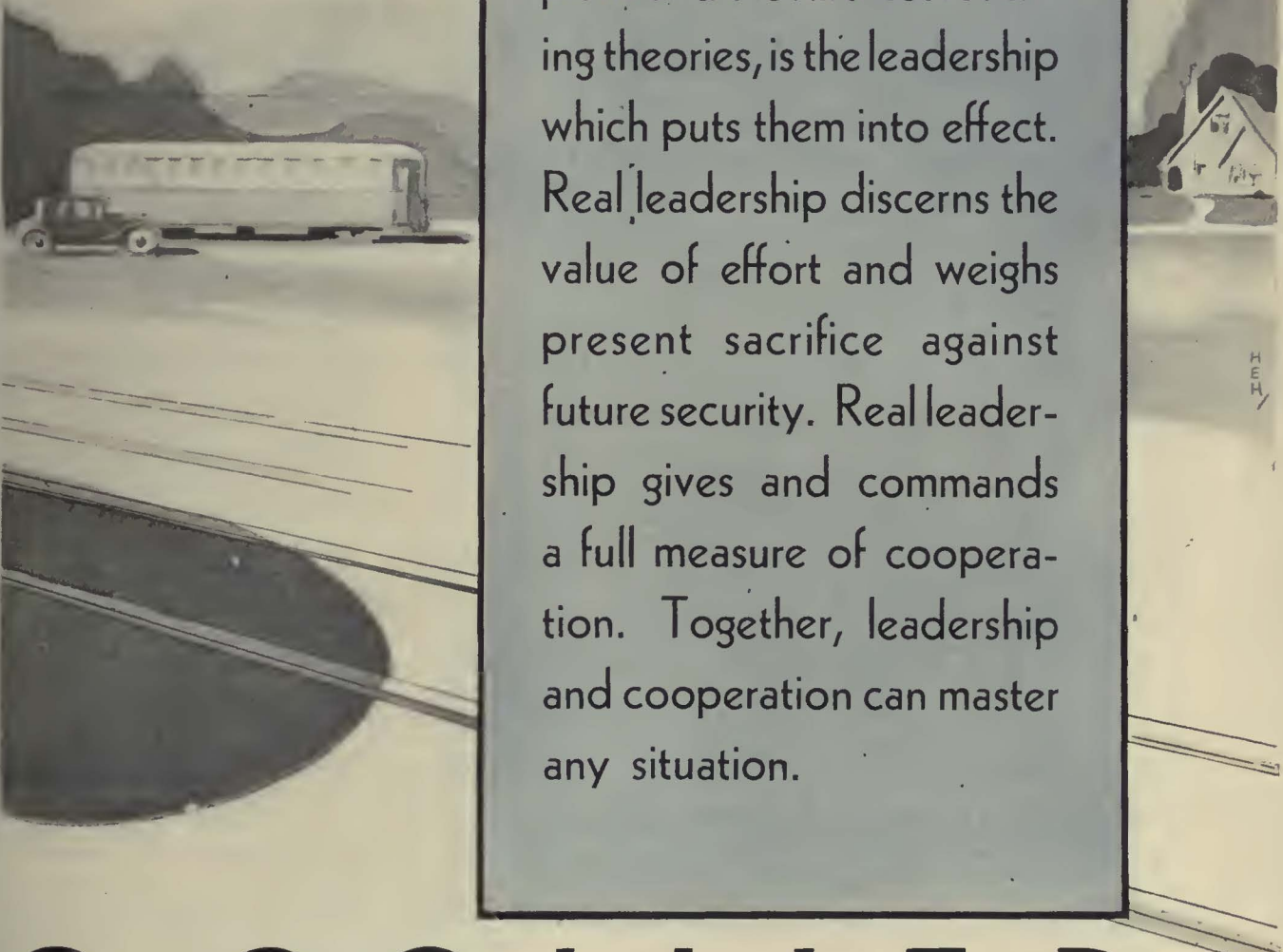


CAR CARD ADVERTISING
ALMOST EVERYWHERE

A graphic illustration on a dark rectangular background. It features a globe of the Earth with a train track orbiting it. The track is depicted as a series of parallel lines that curve around the globe, with several small train cars positioned on it. The text "CAR CARD ADVERTISING ALMOST EVERYWHERE" is printed in a bold, sans-serif font above the globe.

BARRON

R S H I P

An illustration of a bus and a house. The bus is on the left, and the house is on the right. The bus is a long, white vehicle with a dark roof and wheels. The house is a small, white building with a dark roof and a chimney. The background shows a landscape with hills and a sky. The illustration is in a simple, sketchy style.

Better than the best laid plans and the furthest reaching theories, is the leadership which puts them into effect. Real leadership discerns the value of effort and weighs present sacrifice against future security. Real leadership gives and commands a full measure of cooperation. Together, leadership and cooperation can master any situation.

G. C O L L I E R INC.

NEW YORK CITY



The Responsibility of the Railroad Equipment Manufacturer

Every railroad equipment manufacturer realizes the responsibility that rests on his shoulders. He must supply equipment that will enable the railroad to operate economically, with a minimum of repairs and replacements and with absolute safety. No manufacturer will assume this responsibility without a great amount of experience behind him. In addition he must maintain a constant series of laboratory experiments to improve his product and to keep abreast of operating conditions. His raw material must be of the best and this material, as well as every step in his process of manufacture, must be carefully checked, inspected and supervised. Many manufacturers continue to inspect their equipment even after it is placed in service. Thus manufacturers are able to stand behind the things they make, and to accept the responsibility for them. The Standard Steel Works Company, because of their adherence to these principles, take pride in accepting their responsibility with assurance. Their products are safe and long-lived.



STANDARD STEEL WORKS COMPANY

GENERAL OFFICES & WORKS: BURNHAM, PENNA.

CHICAGO

NEW YORK

PHILADELPHIA

ST. LOUIS

AKRON

PORTLAND

SAN FRANCISCO

Interurban cars weigh
12,990 lbs. less

"ALUMINIZED"

Power Savings alone
will absorb the extra
cost in 31 months



REG. U. S. PAT. OFF.

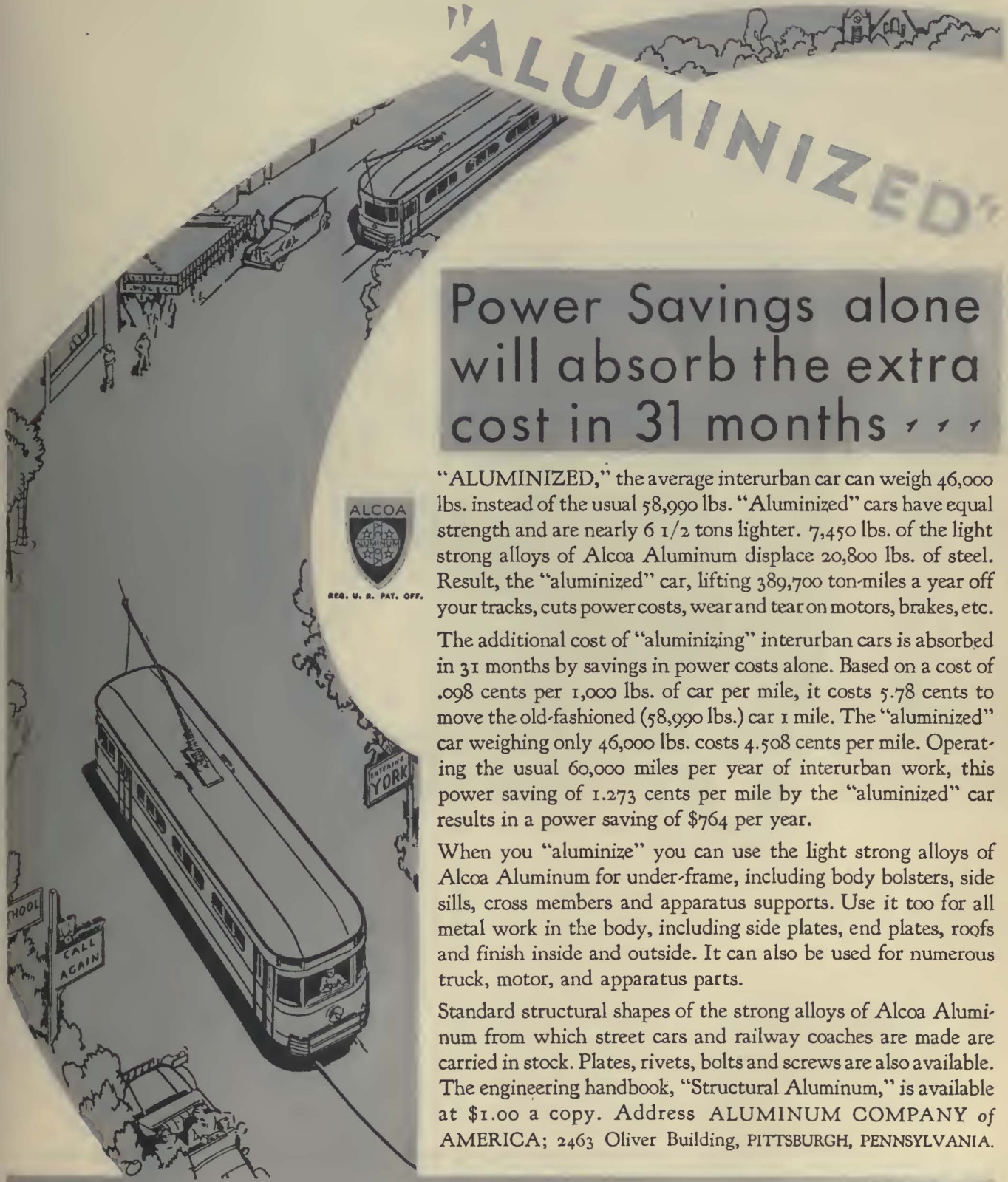
"ALUMINIZED," the average interurban car can weigh 46,000 lbs. instead of the usual 58,990 lbs. "Aluminized" cars have equal strength and are nearly 6 1/2 tons lighter. 7,450 lbs. of the light strong alloys of Alcoa Aluminum displace 20,800 lbs. of steel. Result, the "aluminized" car, lifting 389,700 ton-miles a year off your tracks, cuts power costs, wear and tear on motors, brakes, etc.

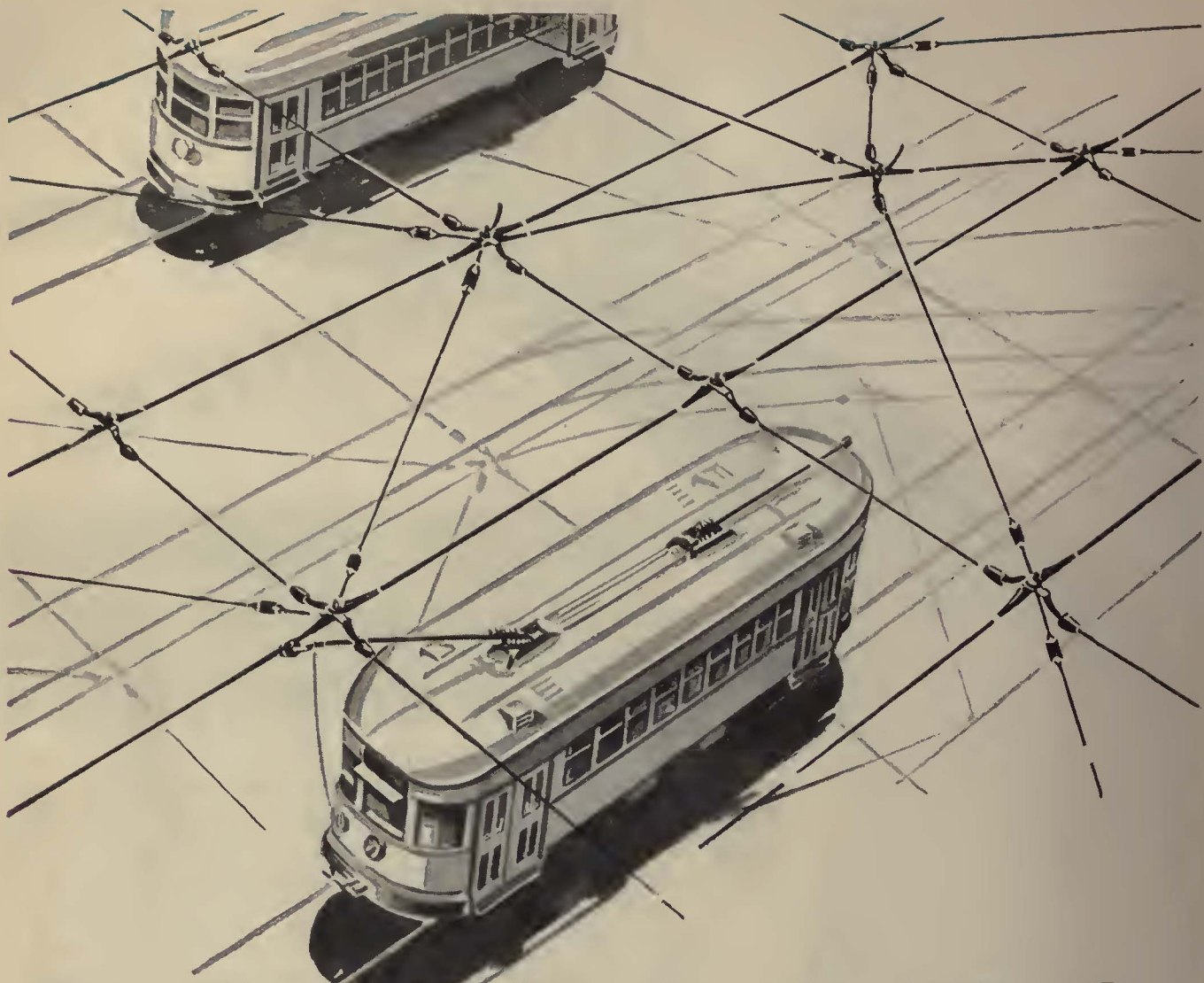
The additional cost of "aluminizing" interurban cars is absorbed in 31 months by savings in power costs alone. Based on a cost of .098 cents per 1,000 lbs. of car per mile, it costs 5.78 cents to move the old-fashioned (58,990 lbs.) car 1 mile. The "aluminized" car weighing only 46,000 lbs. costs 4.508 cents per mile. Operating the usual 60,000 miles per year of interurban work, this power saving of 1.273 cents per mile by the "aluminized" car results in a power saving of \$764 per year.

When you "aluminize" you can use the light strong alloys of Alcoa Aluminum for under-frame, including body bolsters, side sills, cross members and apparatus supports. Use it too for all metal work in the body, including side plates, end plates, roofs and finish inside and outside. It can also be used for numerous truck, motor, and apparatus parts.

Standard structural shapes of the strong alloys of Alcoa Aluminum from which street cars and railway coaches are made are carried in stock. Plates, rivets, bolts and screws are also available. The engineering handbook, "Structural Aluminum," is available at \$1.00 a copy. Address ALUMINUM COMPANY OF AMERICA; 2463 Oliver Building, PITTSBURGH, PENNSYLVANIA.

ALCOA ALUMINUM





ROEBLING

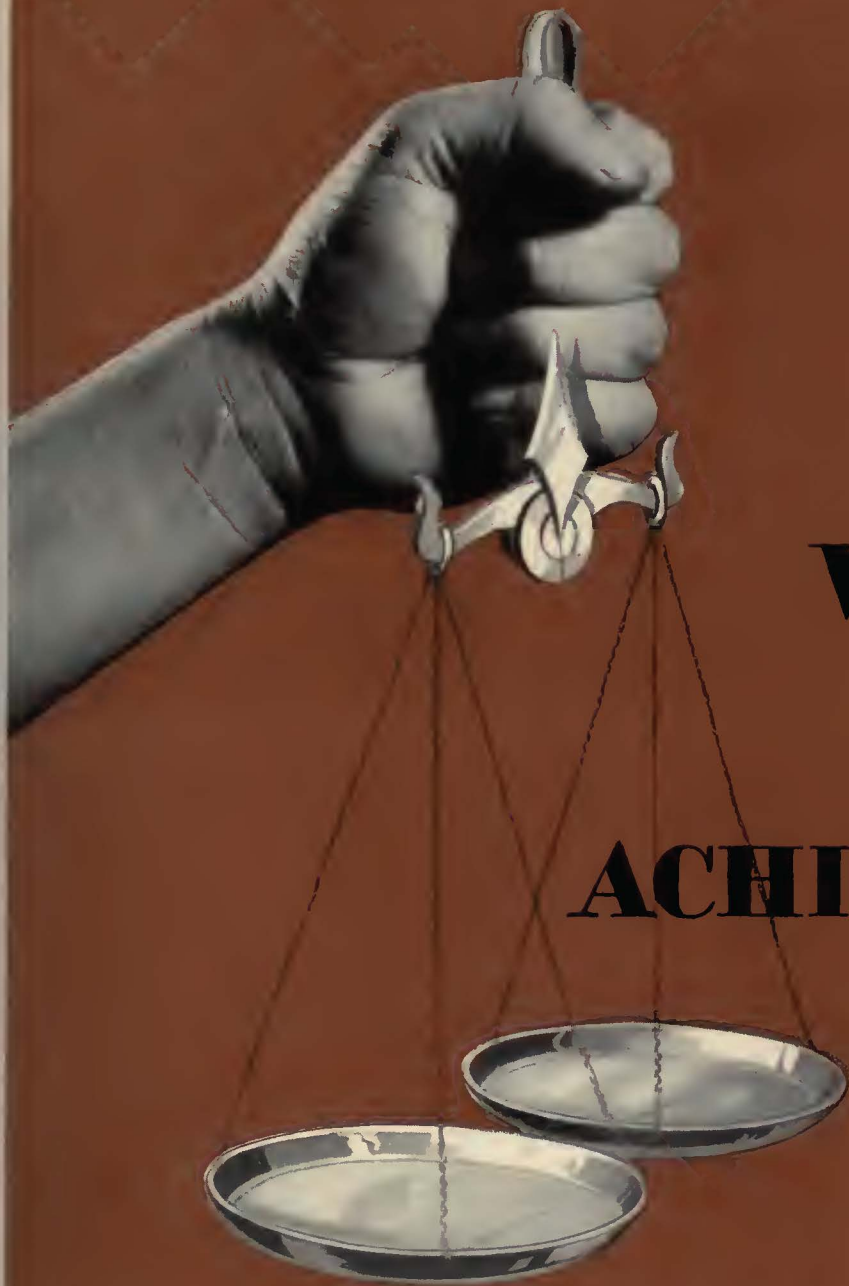
TROLLEY AND CONTACT WIRE is an important Roebing product and hundreds of miles of it span the country. Yet it is merely one of many types of Roebing Electric Wires and Cables serving electric railways everywhere.

Locomotive wire, bond wires, pantograph cable, power cables, parkway cables, railway signal wires and cables—these are simply a few of the Roebing Wires and Cables made for electric railway service. There is hardly an electric wire and cable need that cannot be satisfied by the complete and diversified Roebing Line. Your inquiry for further information and prices would be welcomed by any Roebing office listed.

Railway Signal Wires and Cables » Parkway Cables » Power Cables; Paper, Cambric, Rubber; Braided or Leaded » Car Wire » Locomotive Wire » Bronze Trolley and Contact Wire » Copper Trolley and Contact Wire » Copper Transmission Strand » Guy Wire and Strand » Bond Wires » Ground Wires » Welding Cable; Trailing and Electrode Holder » And a wide variety of other Wires and Cables.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.
 Atlanta Boston Chicago Cleveland Los Angeles New York
 Philadelphia Portland, Ore. San Francisco Seattle Export Dept., New York, N. Y.

ELECTRICAL WIRES AND CABLES



WEIGH
these
ACHIEVEMENTS



PRESENT business conditions have created many new and perplexing problems for the motor coach industry. To successfully cope with the changed operating conditions, vehicle improvements that

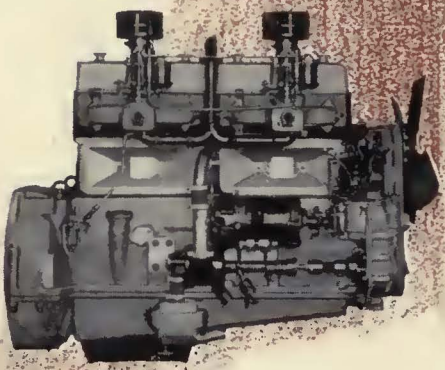


**QUICK-REMOVABLE
POWER PLANT . . .**

*Two men can remove and replace an entire power plant assembly, including radiator, engine, clutch and transmission as a unit, in the same amount of time ordinarily required to remove a single accessory.
Available in Type V, Type 250 and Type 40.*

ENGINES . . .

Four engines of basically similar design but of different displacement and power range have been developed, insuring maximum interchangeability of parts, reduced inventory charges and simplified maintenance.

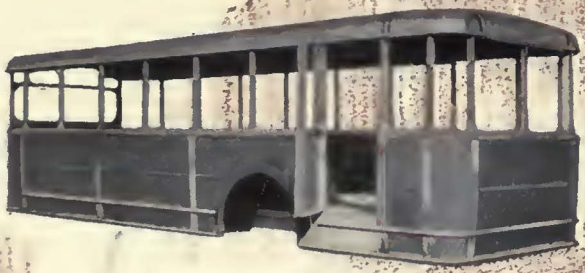


BRAKES . . .

The new Yellow duplex brakes, consisting of four brake shoes, simultaneously actuated by dual air brake diaphragms provide larger brake areas, insure more efficient braking, more uniform wear, longer lining life and less maintenance.

ALL-METAL BODIES . . .

Constructed of standardized and interchangeable parts and sections, precision built over jigs and fixtures, simplifies upkeep, reduces inventory requirements, provides exceptional light weight with greater strength, longer life and more revenue possibilities. Standard on Models Z-29, Z-38, Type 40 and Type 44.



will attract additional revenue, increase dependability of service and reduce costs are essential. At a time when any curtailment of extensive research and engineering development might be judged excusable, Yellow Coach has put more impetus than ever behind the pro-

duction of new and improved

equipment and advancements

in mechanical design. The

urge to strive constantly for

perfection...to make today's

achievements superior to those

of yesterday . . . has been

responsible for many recent

developments of great im-

portance to the progress of



TYPE V . . .

Parlor and city service coaches of intermediate capacity featuring new standards of performance and earning power.

Equipped with either 130 or 115 h.p. engines which are interchangeable. Complete power plant removable in 7½ minutes.



THE IMPROVED "250" . . .

A universally satisfactory 33 passenger transcontinental type coach, refined to still higher peaks of performance, reliability, long life and low-cost maintenance. Complete power plant removable in 10 minutes.

TYPE 40 . . .


An entirely new conception of light weight, low cost mass transportation. 150 h.p. "616" engine mounted in rear, removable in 15 minutes. Forty passenger capacity.



TYPE 44 . . .

All the design improvements of the gas mechanical coach, Type 40, incorporated in a trolley coach of 44 passenger capacity.



highway transportation.  **Yellow Coach** has confidently continued its development work to insure the future prosperity of the industry and to justify the proud distinction of serving year after year as the leading producer of motor coaches.

A Coach for Every Class of Service

TYPE	WHEEL-BASE	PASS. CAPACITY		CYL.	ENGINE DISPLACEMENT
U	185"	16	Low High Headroom Parlor Coach	6	331
U	185"	21-23	City Service Coach	6	331
U	185"	21	Observation Parlor Coach	6	331
U	215"	25	City Service Coach	6	331
W	185"	16	Low/High Headroom Parlor Coach	8	353
W	185"	21-23	City Service Coach	8	353
W	185"	21	Observation Parlor Coach	8	353
W	215"	25	City Service Coach	8	353
V	225"	25	Observation Parlor Coach	6	468
V	225"	29-30	City Service Coach	6	468
V	225"	29	All Metal City Service Coach	6	468
V	225"	29	Observation Parlor Coach	6	525
Z	225"	29	All Metal City Service Coach	6	525
Z	240"	38	All Metal City Service Coach	6	616
250	250"	33	Observation Parlor Coach	6	616
40	213"	40	All Metal City Service Coach	6	616
44	213"	44	All Metal City Trolley Coach		Electric drive 35 or 50 h.p. motors

Gas electric drive and double deck equipment also available.

GENERAL MOTORS TRUCK CO., Pontiac, Mich.
Subsidiary of Yellow Truck & Coach Mfg. Co.



say the car buyers

Test after test has definitely proved that the new Texaco System of car-journal lubrication saves money. It has been proved through years of actual service on a number of important roads. Many buyers of rolling stock in the electric railway field are now specifying this system for all new cars. Those now in operation are rapidly being equipped. • The Texaco System, which includes the application of Texaco Oil Seals and the use of Texaco Lovis Oil as major factors, gives more effective lubrication than had before been thought possible. The savings are surprising. • Detailed facts and figures are available to any interested railway engineer. Write The Texas Company and ask to have a Texaco lubrication engineer call and show you exactly what has been done on other roads—or better yet, let him arrange with you for conclusive tests on your own cars. Find out what this Texaco System will do for you.

THE TEXAS COMPANY, 135 East 42nd Street, New York City



TEXACO lubricants



that qualify for **ANY** service

No matter how exacting your service conditions may be, Carnegie Wrought Steel Wheels will more than measure up to your requirements. They are built to withstand the stress of modern traffic—peak loads, rapid acceleration and emergency stopping. The rolling and forging process by which they are manufactured imparts to the steel exceptional strength and endurance—exceptional safety.



Carnegie Wrought Steel Wheels have long been accepted as the standard of excellence under railroad passenger cars, where the service is severe and where utmost safety precautions are taken. Under electric cars they render the same safe, trouble-free, economical service. Before you invest in wheels, investigate the many advantages of Carnegie Wrought Steel Wheels.

CARNEGIE STEEL COMPANY · PITTSBURGH, PA.

Subsidiary of United



States Steel Corporation

91

CARNEGIE
WROUGHT STEEL WHEELS

EVIDENCE OF SERVICEABILITY IN TROLLEY POLES

STRENGTH BY SPECIAL HEAT TREATMENT

STRENGTH BY HIGH QUALITY OF STEEL

STRENGTH DUE TO SPECIAL REINFORCEMENT


STRENGTH TO MEET ALL SERVICE CONDITIONS

THE first requirement in trolley poles is adequate and lasting strength, which must be provided without excessive weight. Economy in operation of the car, efficiency in service, and safety to the public will depend on the fulfillment of this demand.

The heat-treating and other processes under which NATIONAL-SHELBY Trolley Poles are made, fully develop the potential qualities of the special, high-grade steel which has been chosen for superior strength.

The design of these poles gives complete balance, obviates undue weight, and puts maximum reinforcement where it is most needed. Every pole, before leaving the mill, undergoes the most thorough tests and inspections, to make sure that it is free from defect. Write for complete information.

NATIONAL TUBE COMPANY • Pittsburgh, Pa.

Subsidiary of United  States Steel Corporation

NATIONAL *SHELBY* SEAMLESS POLES

**The SAFETY CAR
CONTROL EQUIPMENT**

*—will wake up
your Drowsy Cars*

IT IS surprising how easily old cars may be given new life and energy . . . They can be converted into Safety Cars—which are safer, and **FASTER**, especially when equipped with the Relay Valve and the Self-Lapping Brake Valve . . . These devices assure very quick build up of brake cylinder pressure and unusually flexible control of this pressure.

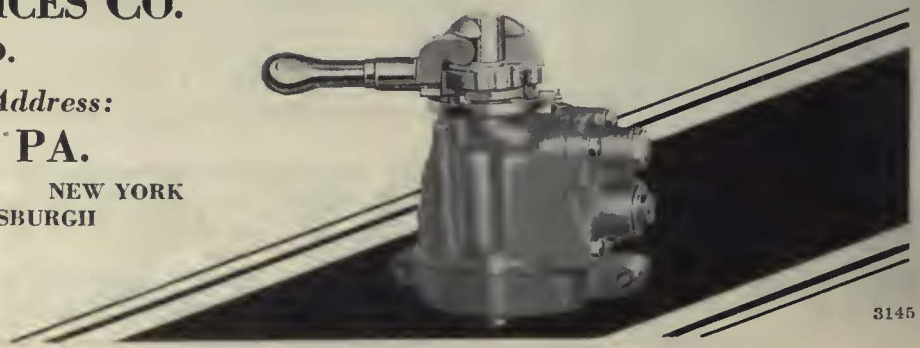
SAFETY CAR DEVICES CO.

OF ST. LOUIS, MO.

Postal and Telegraphic Address:

WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK
WASHINGTON PITTSBURGH



DAVIS "ONE-WEAR" STEEL WHEELS



What Does
It Cost
After You've
Bought It?

This is the question to ask
about wheels.

With the Davis "One-Wear" Steel
Wheel the first cost is the last.

Contour conditioning and all its
attendant expense never troubles
the Davis Wheel.

Special composition steel triple heat
treated, provides unique qualities
that are characteristic only in the
Davis Wheel and make them truly
"One-Wear."

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS

THEY WERE USING 1910 BOLTS ON 1931 MACHINERY



Design and materials had kept pace but obsolete, costly bolts were still used. An interesting R B & W case history

A PURCHASING AGENT for an R B & W customer asked us for prices on a type of bolt we had not made for his industry for years. We went to see what he intended to use the bolt for, and encountered a mechanical anachronism not without a vestige of humor.

A certain piece of equipment had been improved every few years, with the exception of the bolts, which remained the same type of 20 years ago, much too heavy for current requirements, and very expensive to make. The bolt had

been designed in the days before cast iron flanges were replaced by the more ductile pressed steel flanges now in use, and when other parts of the equipment were cruder than now. But no one had thought to modernize the bolt design.

Of course the customer appreciated the suggestion of the R B & W Engineering Service that a standard



bolt would serve the purpose and cost considerably less.

Has your bolt and nut design kept pace with other improvements? Does this offer an opportunity for constructive cost cutting and improved value of your products? Make the R B & W Engineering Service your Bolting Material Counsel.

RUSSELL, BURDSALL & WARD BOLT & NUT CO.

ROCK FALLS, ILL.

PORT CHESTER, N. Y.

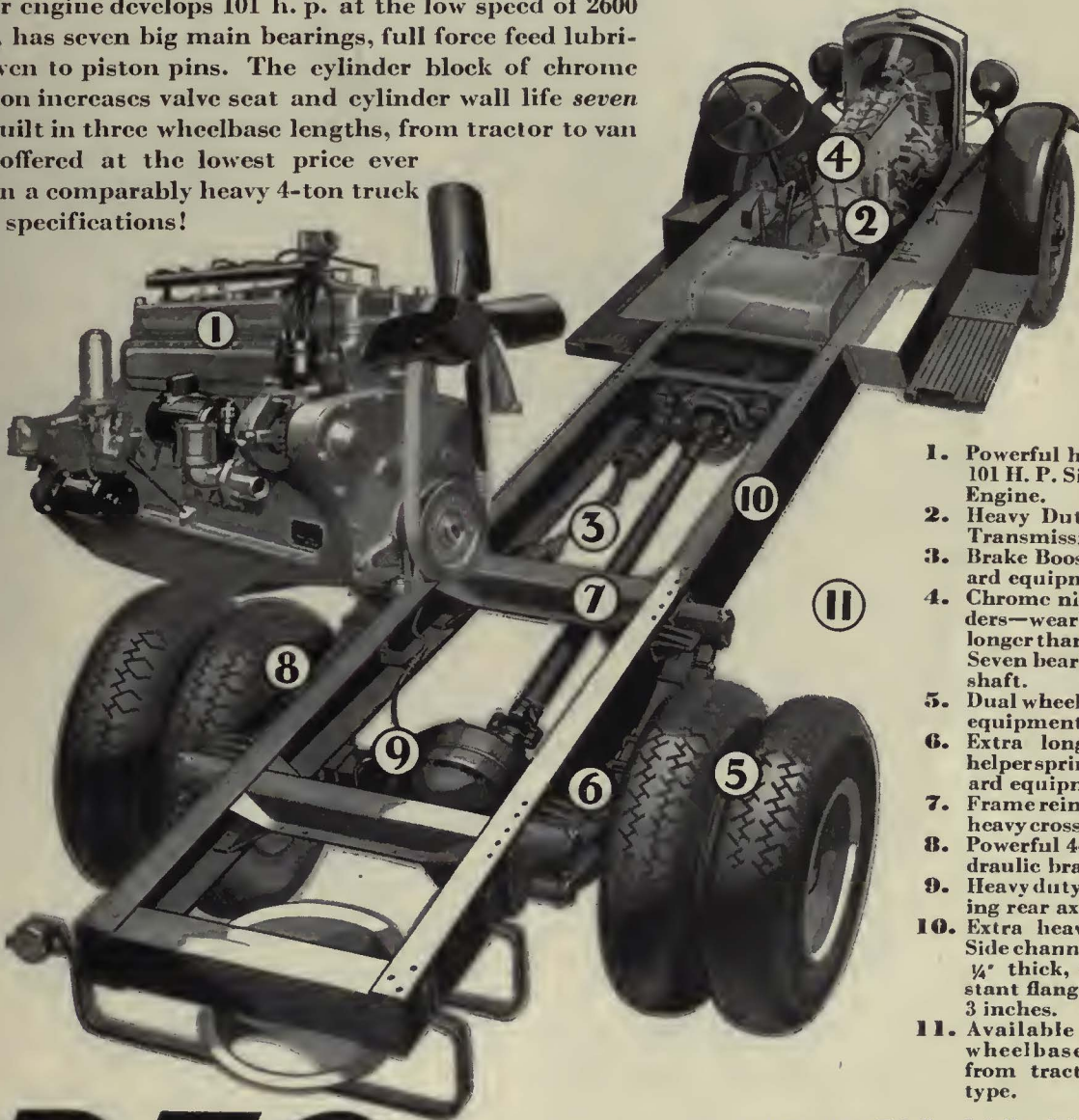
CORAOPCLIS, PA.

Sales Offices at Philadelphia, Detroit, Chicago, San Francisco, Los Angeles, Seattle, Portland, Ore.

THE NEW REO ^{BIG} 4 TONNER

A Truck Built to Do YOUR Job

The new Reo Big Four-Tonner is a heavy truck for heavy work, massively constructed at all vital points. It is engineered for *safe* and *profitable* high-speed travel. The Big 4-Tonner engine develops 101 h. p. at the low speed of 2600 R. P. M., has seven big main bearings, full force feed lubrication even to piston pins. The cylinder block of chrome nickel iron increases valve seat and cylinder wall life *seven times*. Built in three wheelbase lengths, from tractor to van types — offered at the lowest price ever placed on a comparably heavy 4-ton truck of equal specifications!



1. Powerful heavy duty, 101 H. P. Six Cylinder Engine.
2. Heavy Duty 4-speed Transmission.
3. Brake Booster standard equipment.
4. Chrome nickel cylinders—wearing 7 times longer than grey iron. Seven bearing crankshaft.
5. Dual wheels standard equipment.
6. Extra long springs; helpersprings, standard equipment.
7. Frame reinforced by 7 heavy cross members.
8. Powerful 4-wheel hydraulic brakes.
9. Heavy duty full-floating rear axle.
10. Extra heavy frames. Side channels 10" deep $\frac{1}{4}$ " thick, with constant flange width of 3 inches.
11. Available in three wheelbase lengths from tractor to van type.

REO MOTOR CAR COMPANY
LANSING - TORONTO

150-inch wheelbase chassis . . . \$2800
170-inch wheelbase chassis . . . \$2875
190-inch wheelbase chassis . . . \$2950
f. o. b. Lansing

REO

BIG 4 TONNER

\$2800

REDUCES COST
32¢ PER 1000 CAR MILES
WITH NEW LUBRICANT



High speed train running sixty miles an hour.

FLYING over the rails . . . at sixty and sometimes seventy miles an hour . . . the trains of one large high speed electric railway system* had long been subject to excessive bearing failures.

For the past ten months this company has operated all cars with L. C. Motor Journal Oil. A recent check up for this period of operation showed practically complete elimination of hot boxes. It discloses a saving of waste consumption for the first five months of \$1,001.00 and \$497.00 saved in journal brasses consumption. A total saving of nearly 32 cents per thousand car miles has been accomplished.

On other high speed lines and in ordinary

street car service Standard Oil Company (Indiana) lubricants and service have proved equally successful. In practically every instance marked savings have been made in power and waste consumption with an attending increase in the life of bearings and a reduction in bearing temperatures.

You will find it profitable to investigate L. C. Motor Journal Oil. Our engineers will be glad to furnish information and data. Address your request to the Electric Railway Division.

*Name on request.

STANDARD OIL COMPANY
(Indiana) (1209)

910 So. Michigan Avenue

Chicago, Illinois

L. C. MOTOR
JOURNAL OIL

THE IDEAL YEAR AROUND MOTOR JOURNAL OIL FOR ELECTRIC RAILWAY SERVICE

THERE . . . and back
the same way

*Karpen Comfort
sells the round trip*



KARPEN

It's the Seating that Counts



No. 308



No. 13

THE KARPEN SAFE-T-GRIP



Patent Applied For

SafeT Grip



No. 318



No. 100



A GOOD seat brings the rider back the same route. The seat is the "point of contact" between the rider and the transportation. It influences in a large measure the choice of the return trip. It's the seating that counts . . . Make this test yourself, the next time you decide on seat-

ing for bus, street car or interurban, for new construction or replacement. Compare Karpen comfort with other seating. Judge its eye-value for your transportation. And remember the most important factor of all—Karpen has been building good transportation seating for 37 years.

S. KARPEN & BROS.

Transportation Seating Dept., Chicago

New York

Michigan City, Ind.

Los Angeles

KARPEN

It's the Seating that Counts

THERE'S A FLUTED STEEL POLE FOR EVERY TYPE OF SERVICE



In Los Angeles, Union Metal Poles support trolley span wires, street lights and distribution lines.

TWENTY-FOOT Fluted Steel Poles for trolley span wire support—sturdy thirty-footers for distribution lines—double thick steel for unusually heavy loading—fifty and sixty-foot poles for cross-country lines. In short, strength and height to meet every pole requirement . . . And for city streets, where appearance is especially important, ornamental pole bases can be supplied in a wide variety of designs.

The application of Union Metal Poles is almost unlimited.

Wherever wires are strung overhead, Fluted Steel Poles can do the supporting job, and do it efficiently.

Union Metal Poles are made in one piece from high grade steel, welded with a vertical seam and then cold-rolled. In poles up to forty feet in height there are no horizontal joints to collect moisture and hasten corrosion . . . Fluted Steel Poles take standard fittings, are easily adaptable to unusual requirements and will last for years without heavy upkeep expense.

THE UNION METAL MANUFACTURING CO., General Offices and Factory: CANTON, OHIO

Sales Offices: New York, Chicago, Boston, Los Angeles, San Francisco, Dallas, Atlanta • Distributors: Graybar Electric Company, Inc.; General Electric Merchandise Distributors. Offices in all principal cities.

Abroad: The Canadian General Electric Co., The International General Electric Co., Inc.



UNION METAL



DISTRIBUTION POLES

Is it good engineering ?



. . . to court failure in time or to insure success from the start?

Competent engineers claim that there are eleven movements possible in an ordinary paved track structure resulting from as many more contributing causes, each one of which may cause the failure of the structure. These men recognize that even with the most careful engineering and construction, it is impossible to assure against such failure.

With DAYTON TIES, however, only 2 of these 11 movements are possible—*deflection between supports and rail vibration* . . . of these 2, the first permits the DAYTON TIE to exercise its full function, while the second is com-

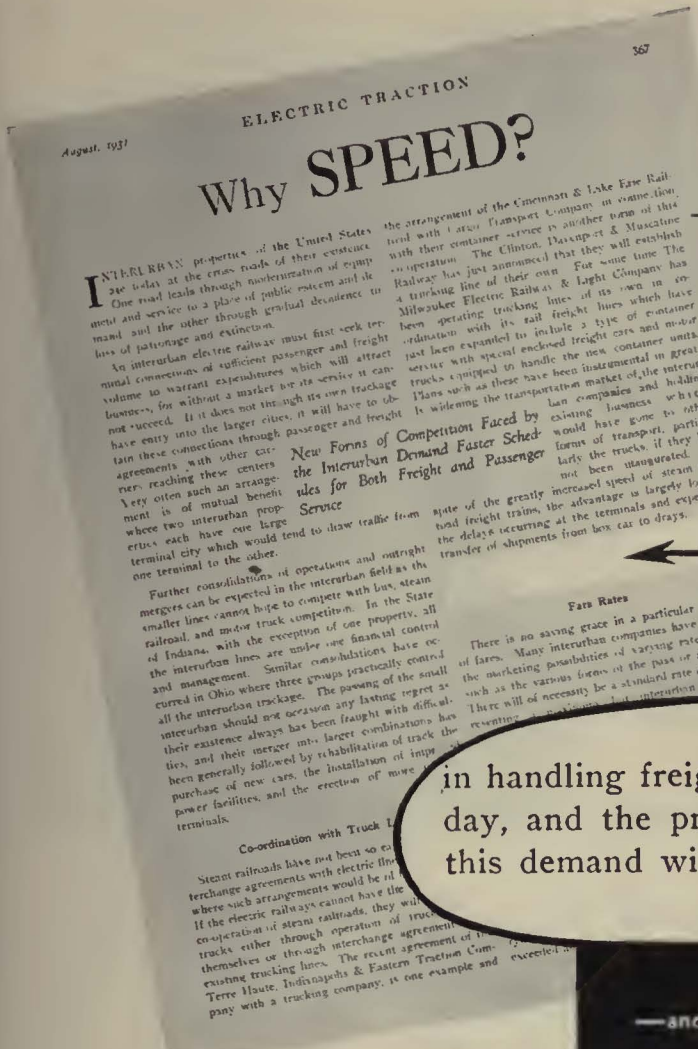
pletely absorbed in the Dayton asphalt cushion tie block.

The varying traffic conditions of 20 years have yet failed to reveal the slightest rail movement or substructure disintegration where DAYTON TIES have been used.

Is it good engineering—is it sound economy to court failure in time or to insure success at the start—Isn't the answer obvious?

THE DAYTON MECHANICAL TIE CO.
DAYTON, OHIO

The better tie . . . without an alibi



— WE REPEAT —

“Why SPEED?”

Speed in handling freight shipments is of vital necessity today, and the progressive interurban which caters to this demand will profit by it.

—and the progressive interurbans which consult with our engineers as to how "Union" Automatic Signals will permit them to attain such increased speeds with safety, will also benefit thereby. There is no obligation.



1881



Union Switch & Signal Co.



1931

SWISSVALE, PA.

Milwaukee and Pittsburgh

believe in offering
bargains for
passengers ...

**New Bus Pass
Sells Widely**
Many Using 15-Cent
Ticket; Rush Is Ex-
pected to Continue

With the institution Thursday night of a new evening pass on the Wisconsin-Prospect, Washington and Sherman bus lines, the Electric Co. experienced a rush—far larger than anticipated. The buses on these lines carried 550 more passengers than normal, it was announced by R. H. Pinkley, vice president. A larger patronage is expected Friday night, if the heat continues, and to meet it the company will put on additional buses.

*Statistics prove they
get the passengers*

15¢ PAS TIME PASS
Good for unlimited riding on any one weekday evening after 6:00 P. M. and all day on SUNDAY

One Child
(5 to 11 years)
FREE
with each passholder

MILWAUKEE CITY LINES
Wisconsin - Prospect
Wisconsin - Sherman
Wisconsin - Washington

WISCONSIN MOTOR BUS LINES

Pittsburgh Railways Co.—WEEKLY PASS
State Road, McKeesport
OCT 4 to OCT 10th, 1931
Good from 4:00 A. M. Sunday until 10:00 P. M. the following Sunday
Passenger showing this Pass is permitted to ride on State Road and McKeesport between Station St., Wilmer and State Road and McKeesport. Seven day good show on State Road and McKeesport.
This Pass is good only for one rider and is to remain in possession of rider.
"NOT GOOD ON SPECIAL TRIPLET CAR"
No. W. 00000
PRICE \$1.00
Commercial Manager

Pittsburgh—featured in a former Globe advertisement has achieved similar results. Write for our experience on this subject of passes.

Quoted from "The Business Week"

The necessity of maintaining street railway traffic has mothered many merchandising innovations. Outstanding are the "bargain fares" which the Milwaukee Electric Railway & Light Company has introduced. The weekly pass has proved very popular. It costs \$1.00, is transferable and is good for any number of rides. Around 50% of revenue now comes from this source, says "Electric Railway Journal." The 10c. cash fares account for 16%, while the 6-trip tickets, worth 50c. bring in 17% of receipts. More people go home for lunch from downtown, and short-haul traffic has increased. Wide use of the pass has increased speed of operation.

Last Christmas a 75c. pass was put on sale, and about 3,000 were bought each week.

Later a 75c. shopper-theatre pass was introduced and is still being used. This ticket is good from 9 a.m. to 4 p.m. and after 7 p.m. weekdays, after 9 a.m. Saturdays and all day Sundays. On an average, about 1,800 shopper-theatre passes are in use weekly.

"Pastime Pass" This summer an attractive 50c. night pass was put into effect to induce people to take interurban rides for recreation. Another innovation was the 15c. "pastime pass," which with an additional cash payment of 10c. is good for unlimited riding in the evening on de luxe city buses.

GLOBE TICKET COMPANY PHILADELPHIA

FACTORIES: Philadelphia, Los Angeles, Cincinnati, Pittsburgh, Boston, New York, Baltimore, Cleveland, Atlanta, St. Louis, Des Moines

Globe TICKETS...TRANSFERS...PASSES

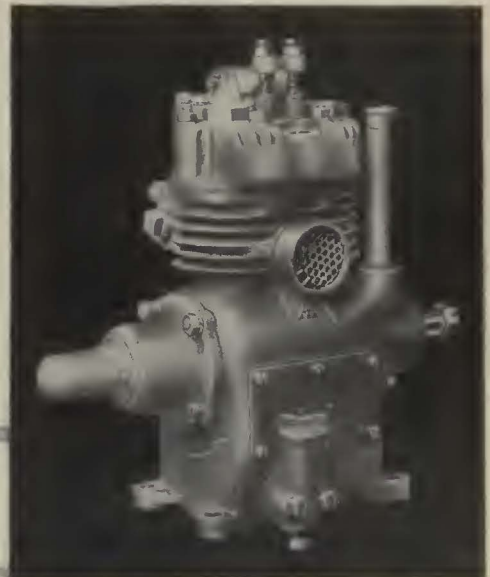


BRAKES and the modern TRAILER TRAIN

No need to stress the fact that trailer train operation is a rapidly growing, decidedly economical form of modern highway transportation . . . Likewise there is little necessity to explain the obviously indispensable place brakes by Bendix-Westinghouse hold in the success of this important branch of highway commerce

★ Universally accepted as the standard control for modern heavy-duty transport units, Bendix-Westinghouse Automotive Air Brakes, in their unchallenged success, are merely maintaining a confidence born of a manufacturing background of more than a half century ★ Lightning quick, powerful, traditionally dependable, Bendix-Westinghouse control is something more than just a brake . . . This modern equipment assures constantly perfect equalization of braking pressures, greatly lengthens periods between adjustments, increases lining life, provides an automatic safety feature in case of a break-away, at any point, in train operation and makes every truck or tractor a potential trailer carrier ★ Write today for more specific information regarding the countless advantages of modern Air Brake Control . . . Address BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY at Pittsburgh, Penna.

6296



BENDIX ★

WESTINGHOUSE

AUTOMOTIVE ★ AIR ★ BRAKES

“I’ll see it through
if you will!”



“**T**HEY tell me there’s five or six million of us—out of jobs.

“I know that’s not your fault, any more than it is mine.

“But that doesn’t change the fact that some of us right now are in a pretty tough spot—with families to worry about—and a workless winter ahead.

“Understand, we’re not begging. We’d rather have a job than anything else you can give us.

“We’re not scared, either. If you think the good old U. S. A. is in a bad way more than temporarily, just try to figure out some other place you’d rather be.

“But, until times do loosen up, we’ve got to have a little help.

“So I’m asking *you* to give us a lift, just as I would give one to you if I stood in your shoes and you in mine.

“Now don’t send me any money—that isn’t the idea. Don’t even send any to the Committee which signs this appeal.

“The best way to help us is to give as generously as you can to your local welfare and charity organizations, your community chest or your emergency relief committee if you have one.

“That’s my story, the rest is up to you.

“I’ll see it through—if *you* will!”

—Unemployed, 1931

THE PRESIDENT’S ORGANIZATION ON UNEMPLOYMENT RELIEF

Walter S. Gifford

Director

COMMITTEE ON MOBILIZATION OF RELIEF RESOURCES

Owen D. Young

Chairman

The President’s Organization on Unemployment Relief is non-political and non-sectarian. Its purpose is to aid local welfare and relief agencies everywhere to provide for local needs. All facilities for the nationwide program, including this advertisement, have been furnished to the Committee without cost.

**BY THIS SIGN
YOU WILL
KNOW THEM**



TRADE MARK

**SYMBOL OF A COMPLETELY
OWNED OPERATION FROM
TREE TO LOADED CAR**

This Warranty Mark signifies Dense Long Leaf Yellow Pine, correctly seasoned and uniformly graded, and it is branded on every piece of Jackson stock.

Selling Agents

GEORGE G. LEAVETTE	F. B. MERRITT
Room 416	Room 1560
25 Broadway	First National Bank Bldg.
New York City	Detroit, Mich.

JACKSON LUMBER Co.

Manufacturers

Lockhart, Alabama

A CROSSETT WATZEK GATES INDUSTRY

Illinois Resurfaces 63²³/₁₀₀ MILES WITH BRICK



(Above) Completed brick resurfacing of worn concrete by Illinois State Highway Department on Route 4 south of Springfield. This gives the highest type highway at low cost.

(Inset) Worn slab being prepared for curb and brick resurfacing.

Photos by courtesy of Division of Highways, State of Illinois

ILLINOIS began a brilliant chapter in highway economy this year, by widening and resurfacing worn concrete roads with brick.

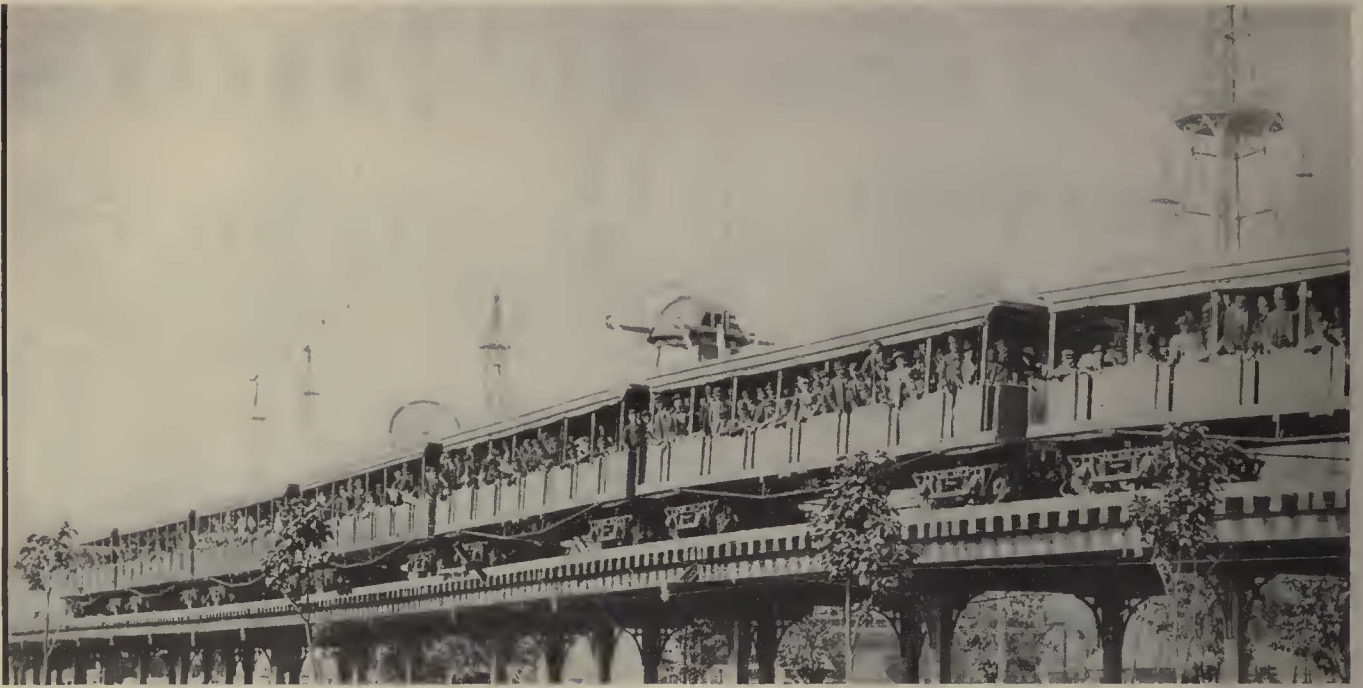
A total of 63.23 miles constituted the initial program.

Thus, slabs that have not too far approached the end of their usefulness are being saved for many years to come. *Brick* pavements built 30 and 40 years ago are in constant use today, although not nearly so well constructed as these Illinois brick resurfaced sections.

The economy and sound judgment in resurfacing with brick is apparent. The worn concrete—unsatisfactory as a pavement—will make a good base on a subgrade that has received its full settlement. Mastic cushion and bituminous filled brick surface prevent transmission of cracks. Weather and traffic will have no effect on the brick surface. The existing slab has been transformed into a low-maintenance road extraordinarily well suited to all traffic.

Highway engineers, officials and taxpayers will find much of interest in this Illinois work.

Further information on resurfacing with brick may be had by addressing the National Paving Brick Association, 1245 National Press Building, Washington, D. C.



FIRST ELECTRIC TRAIN ~ 1893

THE first electric train was operated in Chicago in 1893 at the World's Fair. Mr. J. S. Doyle, now of the Interborough Rapid Transit Company of New York, supervised the installation of the wiring on this train and used Okonite wire and Okonite and Manson tapes throughout. This train was the forerunner



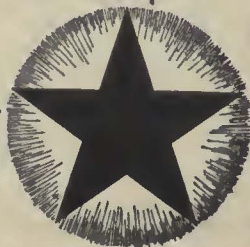
**ALL
ISN'T
GOLD . . .**

THE thought contained in that old saying "All is not gold that glitters" may well be applied to trolley wheels.

It takes the finest in materials and workmanship to produce Kalamazoo Trolley Wheels. They always provide ample conductivity and resist the wear caused by pounding against trolley cars.

Let us tell you why we have supplied continuously for over 25 years, many of the country's leading Electric Railways.

THE STAR BRASS WORKS
Kalamazoo
Michigan



KALAMAZOO



TUCOLITH

Long Wearing

Even the rough brogans of stamping workmen do not injure the hard, tough surface of Tucolith floors.

6 REASONS WHY

Tucolith is the popular flooring material for cars and busses.

- | | |
|---------------------|-------------------|
| 1. Long Life | 4. Fireproof |
| 2. Attractive | 5. Sound Deadence |
| 3. Non-Slip Surface | 6. Sanitary |

TUCO PRODUCTS CORP.
30 CHURCH ST., NEW YORK
PEOPLES GAS BLDG.
122 S. MICHIGAN AVE., CHICAGO



of all of the heavy traction lines in the world — subway or elevated. Even as they demanded the best of wire and tape in 1893, so do their successors today. Thus Okonite is found wherever severe operating conditions exist,

THE OKONITE COMPANY

Founded 1878

THE OKONITE-CALLENDER CABLE COMPANY, INC.

Factories: Passaic, N. J.

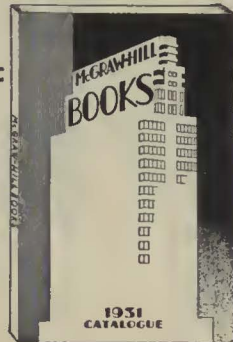
Paterson, N. J.



Now Ready!

YOUR
FREE COPY
of the
New 1931
Catalogue of

McGRAW-HILL BOOKS
on Engineering and Business



HERE is the key to the latest, most authoritative and practical information for reference and study in your field. In the more than 1500 books described in this catalogue will be found the latest advances, vital new data, methods of leading concerns in all lines, the cream of experience, the knowledge of experts—the information that leads to success today. Furthermore it shows how to place your book-buying on an easy budget basis. Get the books as you need them—pay for them by the month as you use them.

Send for your free copy today!

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York City.

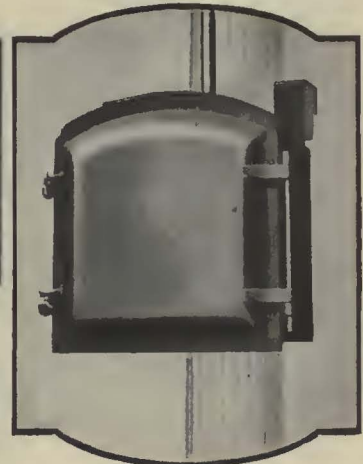
Send me the new 1931 McGRAW-HILL CATALOGUE of Engineering and Business Books. This catalogue is to be sent entirely without cost.

Name

Address

City and State..... E. 10-31

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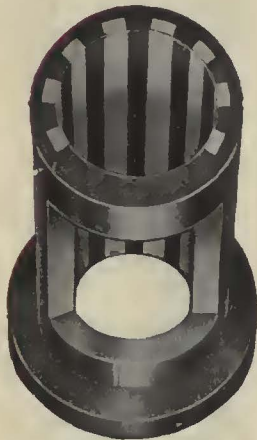
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NATIONAL ELECTRIC RAILWAY SPECIALTIES

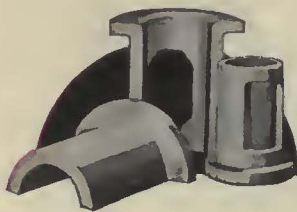


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Our products have been thoroughly tested to meet your requirements. This saves you the trouble of frequent tests to attain satisfactory results. In our long contact with the industry we have had every variety of problem to solve. Let us give you the benefit of this experience.



The "Vigne" Bimetallic Armature Bearing



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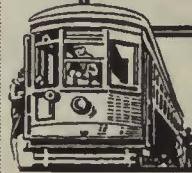
—the car curtain and upholstery material that pays back its cost by many added years of service. Since 1897 there has been no substitute for Pantasote.

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—the only panel board made in one piece. It is homogeneous and waterproof. Will not separate, warp or blister.

*Standard
for electric railway cars
and motor buses*



*Samples and full
information gladly
furnished.*

The PANTASOTE COMPANY, Inc.
250 Park Avenue NEW YORK

*November
Issue Closes
October 23rd*

Early receipt of copy and plates will enable us to serve you best—to furnish proofs in ample time so changes or corrections may be made if desired.

ELECTRIC RAILWAY JOURNAL

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SPECIAL CARBON STEEL
HEAT TREATED

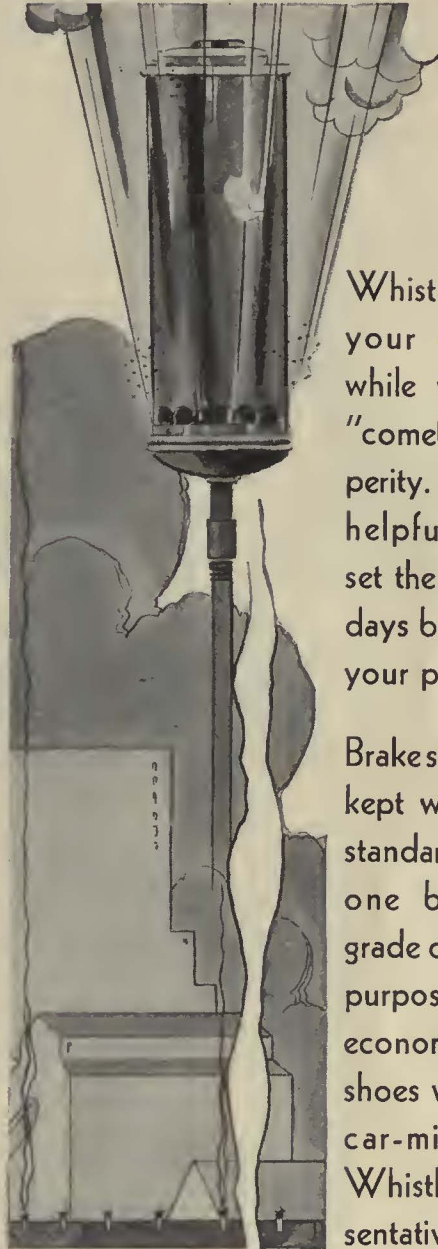


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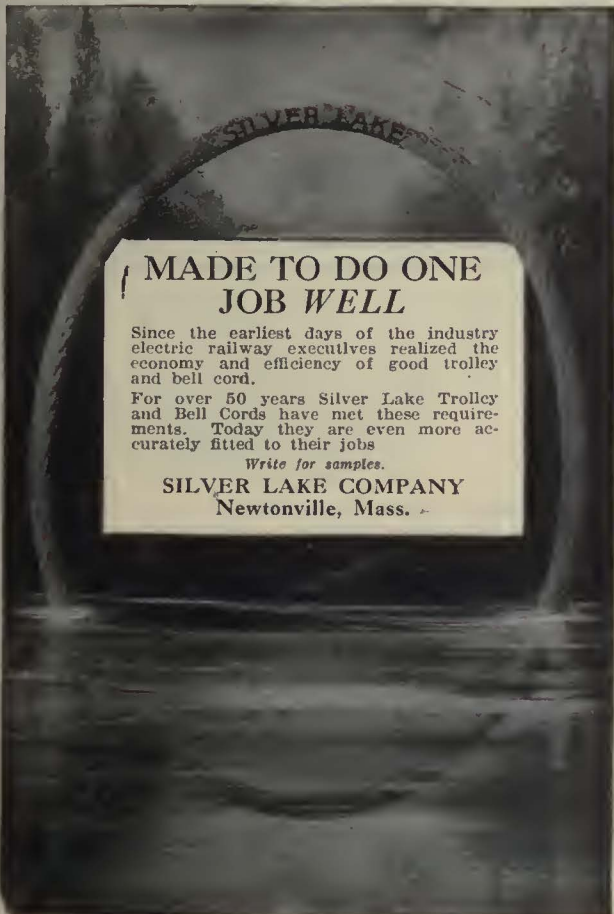
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Brake shoe costs can be kept well in hand by standardizing on the one best type and grade of shoe for every purpose. There's no economy in low priced shoes which raise your car-mile costs.

Whistle for our representative who will be glad to furnish you with facts and figures.

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Closes October 23rd

Early receipt of copy and
plates will enable us to serve
you best—to furnish proofs
in ample time so changes or
corrections may be made if
desired.

ELECTRIC RAILWAY JOURNAL

Every Wire Welded



Erico
Type CAEH
Bond

All wires exposed to the welder's arc, a large area of welded contact is secured with a minimum of weld metal. The hook holds the terminal just right for quick, sure application.

Well Bonded Rails are Efficiency Insurance

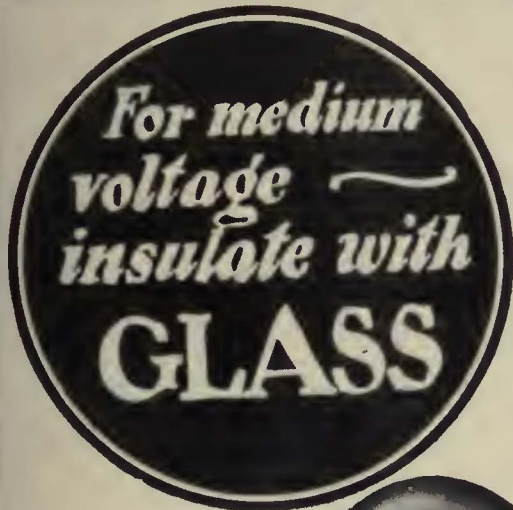
Speed, efficiency and economy — rail bonds have a lot to do with all three—are important equipment.

With Erico bonds you are assured track return circuits of maximum capacity throughout the life of the track. Whatever your track construction there is an Erico Rail Bond to fit your requirements.

Write us for full information.

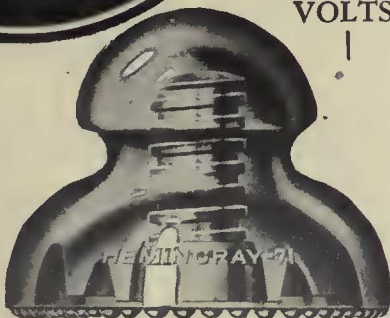


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2070 E. 61st Place, Cleveland, Ohio



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HEMINGRAY GLASS COMPANY
General Offices and Factory Muncie, Indiana

BEST
UP
TO
15,000
VOLTS

- ELECTRIC CAR-HEATERS
- THERMOSTATIC CONTROL
- STEAM HEATERS FOR BUSES
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- SAFETY SWITCHES
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BUS operators can't afford to run the risks of frozen radiators . . . tied-up rolling stock, costly repairs! Some safeguard against freezing must be taken . . .

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Follow the recommendations of anti-freeze compound manufacturers who advise a thorough cleaning of the cooling system before the use of their product. At only a fractional part of the cost of any anti-freeze solution you may use, Oakite materials will give the thorough preliminary cleaning needed to assure maximum protection during the winter months.

An Oakite material circulated through the cooling system removes every trace of oil, dirt and grease. The job is easily and quickly done . . . a few minutes now may save hours of trouble later.

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Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada

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Industrial Cleaning Materials and Methods

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EMPLOYMENT : BUSINESS : OPPORTUNITIES : EQUIPMENT—USED or SPECIAL

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Positions Wanted, 5 cents a word, minimum \$1.00 an insertion, payable in advance.
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Over 6000
 other men
 in the
 Electric
 Railway
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 will see
 this page

Then—isn't this
 the logical place to
 advertise any busi-
 ness wants you
 may have of inter-
 est to Electric
 Railway men?

**EMPLOYMENT
 BUSINESS**

or

**EQUIPMENT
 OPPORTUNITIES,
 Etc., Etc., Etc.**

DISMANTLING?

Let us handle this for you. We specialize in buying and dismantling entire railroads, street railways, industrial and public service properties which have ceased operation. We furnish expert appraisals on all such properties.

Consult us also about New and Relaying Rails—all weights and sections. You will like our service.

The Perry, Buxton, Doane Company

(Capital \$1,000,000.00)

Boston Office, P. O. Box 5253, Boston, Mass.

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FOR SALE

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2—4-motor Freight Cars, each equipped with Westinghouse 557, 150-hp. Motors, HL control, automatic air brakes.

1—300 kw., 33,000/445 volt, 60 cycle, 600 volt, D.C., Westinghouse Automatic Substation.

2—500 kw., 33,000/445 volt, 60 cycle 600 volt, D.C., Westinghouse Automatic Substations.

1—500 kw., 33,000/445 volt, 60 cycle, 600 volt, D.C., Westinghouse Portable Automatic Substation.

10—Standard Interurban Box Cars.

Terms can be arranged.

FS-258, Electric Railway Journal, 520 No. Michigan Ave., Chicago, Ill.

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ARMATURE winder, electrician, 15 years' experience; references furnished; go anywhere on short notice. PW-248, Electric Railway Journal, 883 Mission St., San Francisco, Cal.

WANTED position as working foreman, either night or day, twelve years' experience. Handy with carpenter tools. Can wind armatures, and do all kinds of wiring. PW-259, Electric Railway Journal, Tenth Ave. at 36th St., New York.

POSITION VACANT

TRACK foreman wanted, familiar with special track work on high-speed electric lines. If you desire such a position insert an advertisement in the Searchlight Section of Electric Railway Journal.

FOR SALE

10 Double Truck
 Four Motor Shear

Snow Plows
 First Class Condition

Also 85

Cleveland Fare Boxes

Prices Reasonable

Eastern Massachusetts

Street Ry. Co.

Boston

650,000 SAFE... *quick*... *quiet* STOPS



STOPS at high speed—stops at low speed—stops with the brakes hot—stops with them cold—25,000 miles of stops through the congested traffic of a busy eastern city. And this set of Johns-Manville Brake Blocks is still in good condition, ready for thousands of miles more of cost-free operation.

Test a set of J-M Brake Blocks on the toughest route your buses travel. Notice the high speeds, the smoother, quicker stopping, the safer braking they permit. Watch how they reduce upkeep costs. Check up on the thou-

sands of miles additional service they give you—notice how shop lay-ups for adjustments are reduced—how road delays are eliminated. J-M Brake Blocks increase tire life. They spare the brake drums, cut the risk of accidents and lessen the fatigue of drivers.

J-M Brake Blocks have been designed to stand up under high speed, heavy duty operation—and they do. Made of asbestos, of uniform structure throughout, their gripping power remains positive and constant at all stages of wear. Every fleet owner



concerned with keeping costs down should investigate this modern tested friction material. Address: Johns-Manville, New York, St. Louis, San Francisco, Cleveland, Chicago, Philadelphia, Montreal.

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Bus & Car Insulation

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AN EXHIBIT OF PROGRESS

THE Brill Convention Exhibit presented many new developments, the results of continued efforts to provide equipment measuring up to the highest standards of performance and maintenance.

PHILADELPHIA & WESTERN HI-SPEED CAR

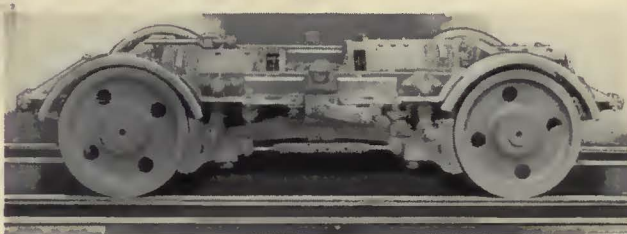
After extensive wind tunnel tests, which demonstrated the power economies possible, this highly stream-lined car design was developed. Equipped with four 100 H.P. motors, it weighs only 52,400 lbs.



Aluminum alloys principally used in construction

NEW BRILL 90-E WORM-DRIVE TRUCK

This low-level, light-weight truck has inside-hung, high-speed motors and worm-type drive for smooth, comfortable and quiet operation.



Low unsprung weight features new 90-E Truck

NEW DESIGN FOR BRILL TROLLEY BUSES

Both the new Brill "30" and "40" Trolley Buses are of a new simplified design. One is equipped with a single 50 H.P. motor and the other has two motors. An improvement in equipment installation practice is evident in both vehicles. The requirements of both the smaller and larger communities were given consideration in both the design and equipment.



One of five Brill 40-passenger Trolley Buses for Peoria

THE J. G. BRILL COMPANY PHILADELPHIA

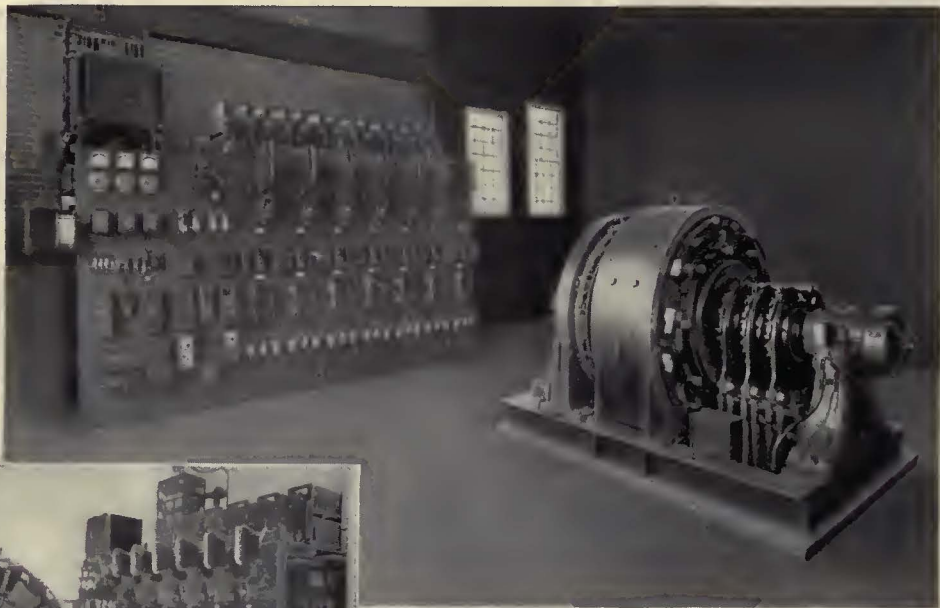
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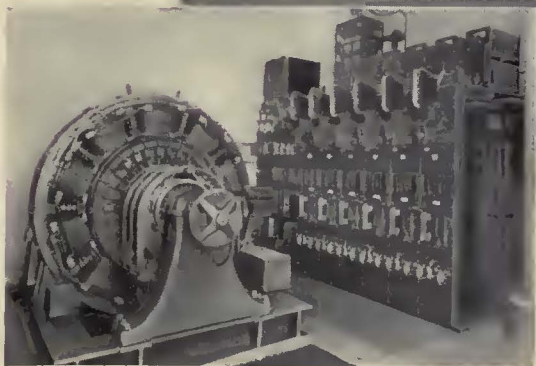
THE J. G. BRILL COMPANY OF OHIO - CLEVELAND
THE J. G. BRILL COMPANY OF MASSACHUSETTS - SPRINGFIELD

CARS - TRUCKS - TROLLEY BUSES

Omaha's street railway *modernized* its power supply with G-E automatic equipment



Interiors of two G-E equipped automatic substations operated by Omaha and Council Bluffs Street Railway



Exterior of one of the substations

BY ESTABLISHING nine automatic synchronous-converter substations, completely G-E equipped, the Omaha and Council Bluffs Street Railway Company has realized these principal advantages:

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Saving in power

(a) through improved distribution

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Improved voltage regulation resulting in faster acceleration and higher schedule speeds

Better public relations due to modern equipment and better morale of car operators

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SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES