

ELECTRIC RAILWAY JOURNAL



Okonite Tapes

Make Dependable Joints

OF unvarying quality—made to the highest standard, OKONITE TAPES can be depended upon to give a service that will be thoroughly satisfactory for years to come. Their use means permanence and economy on your lines.

“Okonite” Tape (Splicing) “Manson” Tape (Friction)
Dundee “A” & “B” Tapes (Friction)

Illustrated Booklet “Splices & Tapes for Rubber Insulated Wires” on Request

The Okonite Company
The Okonite-Callender Cable Company, Inc.



Factories: PASSAIC, N. J.

PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
Birmingham San Francisco Los Angeles Seattle



Pettingell-Andrews Co., Boston, Mass.
F. D. Lawrence Electric Co., Cincinnati, O.
Novelty Electric Co., Phila., Pa.

Canadian Representatives:
Engineering Materials Limited, Montreal
Cuban Representatives:
Victor G. Mendoza Co., Havana

Write
to our nearest
office for
samples and
booklets.





13 new cars placed in service by the Youngtown Municipal Railway combine many advanced features. Seats are cushioned and leather covered. Automobile type dome lights provide restful lighting. All control equipment is concealed. Battleship Linoleum covers the floors. These cars have a capacity of 44 passengers and are operated as one-man cars, replacing much heavier two-man cars.

-in Youngstown The Car of a New Day!



SUPPOSE YOU lived in Youngstown. Suppose each evening as the whistles blow and surging masses are homeward bound, the door opened to a clean, inviting car like this. Suppose, inside, you could settle back in a leather-covered cushion seat, and read your paper in comfort, while silent, nimble motors speed you safely homeward—

Wouldn't YOU ride the trolleys?

Youngstown people DO ride. Bright, modern cars invite them; cars that combine the comforts of the private automobile with the safety and convenience of trolley operation;

cars that attract riders because they are attuned to modern tastes.

For this is a new day. The people who live in modern homes—who enjoy every modern convenience—who own modern automobiles, these people can buy and will buy MODERN transportation—in Youngstown or in Your Town!

Discuss your problems with the Westinghouse Representative.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

Sales Offices in All Principal Cities of
the United States and Foreign Countries



1926

Westinghouse

X87853

The new cars are completely equipped with Westinghouse 508-A motors, 25 hp. each, and Type K control.



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London, England

Vol. 67
No. 18

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Service to Industry

ON PAGES 42-43 of this issue is another of the McGraw-Hill full-page advertisements that are being published in prominent daily newspapers in important industrial centers and in magazines devoted to the publishing business.

This particular advertisement is of special interest to readers of ELECTRIC RAILWAY JOURNAL. It pictures in a striking way the resources back of the JOURNAL. It dramatizes the fundamental basis on which McGraw-Hill publications have been built—service to industry.

With 125 editors traveling 700,000 miles a year through industry and with 542 special news correspondents scattered over the world, ELECTRIC RAILWAY JOURNAL together with its associated publications draws on this wide contact and experience in interpreting industrial developments.

You, Mr. Railway Operator, are one of the 220,000 subscribers who read 10,000,000 copies of McGraw-Hill papers annually. Back of the pages of the JOURNAL are the enormous resources of this unique organization built on an ideal. Like other McGraw-Hill publications it is devoted to the upbuilding of its industry and points the way toward bigger opportunity for its readers.

McGRAW-HILL PUBLISHING COMPANY, INC.

Tenth Avenue at 36th Street, New York, N. Y.

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American Machinist

Chemical and Metallurgical Engineering

Coal Age

Engineering and Mining Journal-Press

Ingenieria Internacional

Bus Transportation

Electric Railway Journal

Electrical World

Industrial Engineer

Electrical Merchandising

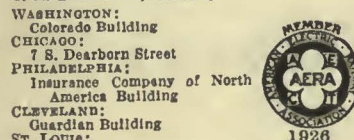
Radio Retaining

Journal of Electricity

(Published in San Francisco)

American Machinist—European Edition

(Published in London)



WASHINGTON:
Colorado Building

CHICAGO:
7 S. Dearborn Street

PHILADELPHIA:
Insurance Company of North America Building

CLEVELAND:
Guardian Building

ST. LOUIS:
Star Building

SAN FRANCISCO:
883 Mission Street

LONDON:
6 Bowyer Street, London, E. C. 4
Member Associated Business Papers, Inc.
Member Audit Bureau of Circulations

The annual subscription rate is \$4 in the United States, Canada, Mexico, Alaska, Hawaii, Philippines, Porto Rico, Canal Zone, Honduras, Cuba, Nicaragua, Peru, Colombia, Bolivia, Dominican Republic, Panama, El Salvador, Argentina, Brazil, Spain, Uruguay, Costa Rica, Ecuador, Guatemala, Chile and Paraguay. Extra foreign postage to other countries \$3 (total \$7 or 28 shillings). Subscriptions may be sent to the New York office or to the London office. Single copies, postage prepaid to any part of the world, 20 cents.

Change of Address—When change of address is ordered the new and the old address must be given, notice to be received at least ten days before the change takes place. Copyright, 1929, by McGraw-Hill Publishing Company, Inc.

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SAVING THE RAIL SAVES THE RAILWAY

The only way—

It is a pleasure to quote Mr. Nels C. Rasmussen, Supt. of Railways, Wisconsin Valley Electric Company:

“ It is through the pleasing appearance as well as comfortable, speedy and safe transportation that we will get our message across to the public, and that only in this way can we expect to get patrons enough to make our industry profitable. ‘Master Mechanic’ wonders where the money to improve equipment is to come from. It is by the improvement of equipment and track that patronage is going to be increased, but occasionally we find some executive who thinks he must either curtail service or cut down the appropriation for maintenance of equipment as soon as the seasonal drop in patronage occurs.

Such men are losing track of the fact that we are at a dawn of a new era in transportation. The standard of living in our country, we are told, is constantly ascending to higher levels. If that is so it holds true equally well in transportation. ”

Never was better advice offered. Indeed, “comfortable, speedy and safe transportation” is the only kind salable at a profit today. And only on well-maintained track can rail transportation be comfortable, speedy, safe and silent at the same time. Such track is readily available. The equipment here shown produces it.

*Now is the time to order
for early spring delivery.*

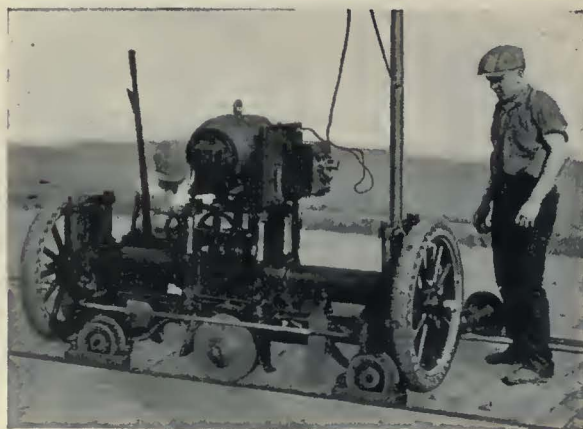
Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

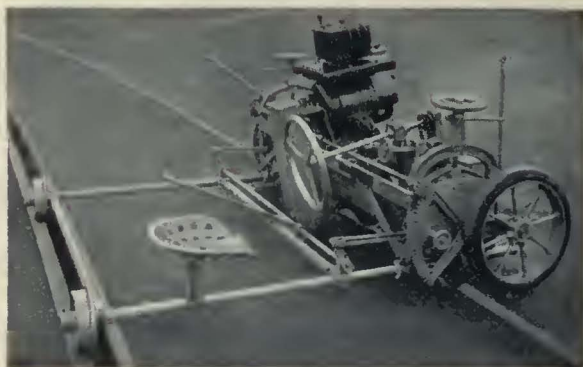
AGENTS:

Chester F. Gailor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
H. F. McDermott, 208 S. LaSalle St., Chicago
Equipment & Engineering Co., London
P. W. Wood Railway Supply Co., New Orleans, La.
Frazar & Co., Japan

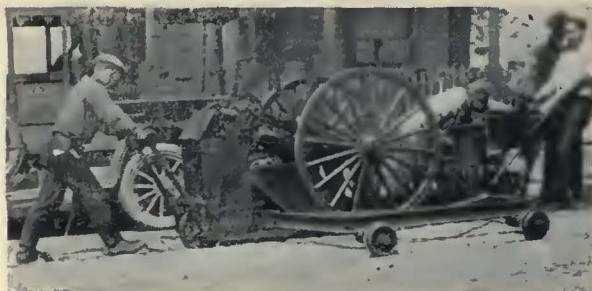
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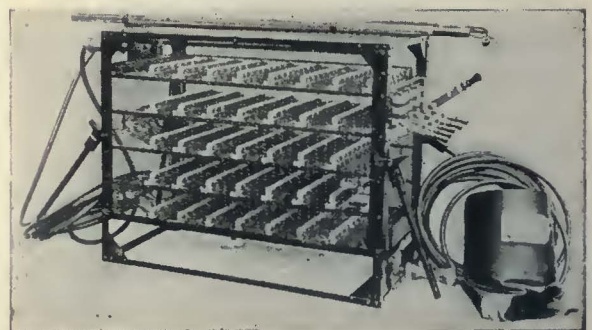
“Imperial” Track Grinder



“Improved Atlas” Rail Grinder



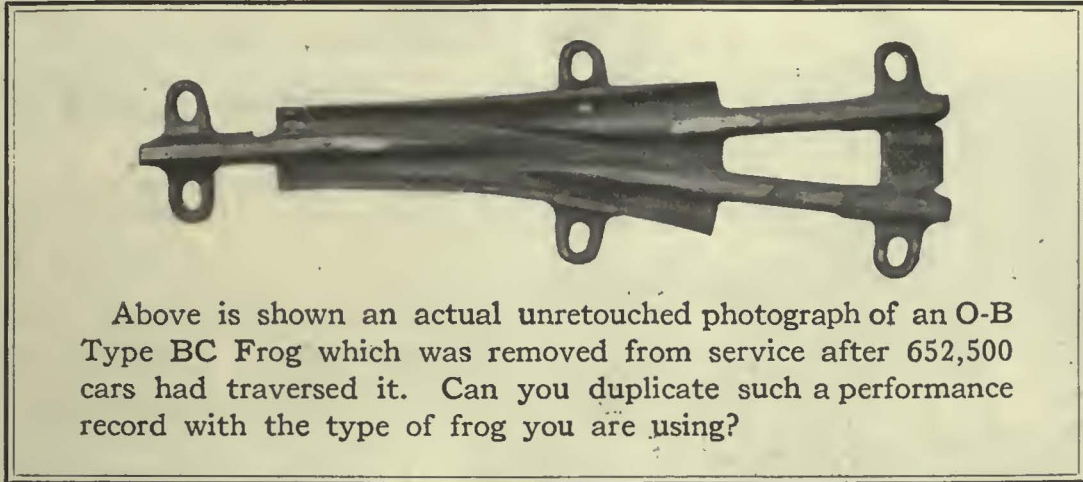
Reciprocating Track Grinder



“Ajax” Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

Do You Get Such Service as this from Trolley Frogs?



You can with O-B Type BC Frogs

MORE than half a million car passes is by no means an exceptional service record for O-B Frogs. The average tests on five big properties was within a few thousand of the half million mark. Many individual O-B Type BC Frogs have gone way past this figure.

The big reason for long life is in the liberal height of the runners and their extended overlap at the center of the frog, which prevent the wheel flanges from running on the pan. There's no jump, no arc, and an easy *smooth* transition all the way through, on the straight or on the angle.

Your trolley frog replacements will be fewer and farther between, when you standardize on O-B Type BC Frogs.



Ohio Brass Company, Mansfield, O.,
Dominion Insulator & Mfg. Co., Limited,
Niagara Falls, Canada

6SB



Ohio Brass Co.

PORCELAIN INSULATORS LINE MATERIALS RAIL BONDS CAR EQUIPMENT MINING MATERIALS VALVES

Safeguard—

operation of those
new cars!



Provide real safety by means of Golden Glow Headlights on the industry's twenty-eight thousand new cars.

The *glass reflector* projects a soft golden beam that easily penetrates fog, dust, rain, mist and the natural darkness of night.

And they wear indefinitely.

Send for full information.

ELECTRIC SERVICE SUPPLIES Co.

PHILADELPHIA
17th and Cambria Sts.

NEW YORK
50 Church St.

CHICAGO—Illinois Merchants' Bank Bldg.

PITTSBURGH
1123 Bessemer Bldg.

BOSTON
88 Broad St.

SCRANTON
316 N. Washington Ave.

DETROIT: General Motors Bldg.

Lyman Tube and Supply Co., Ltd., Montreal, Toronto, Vancouver

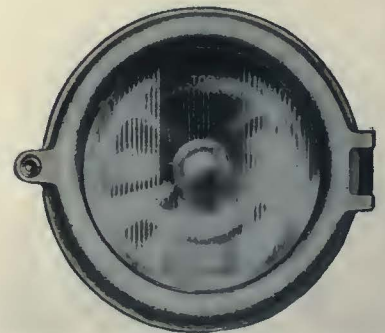
GOLDEN GLOW HEADLIGHTS



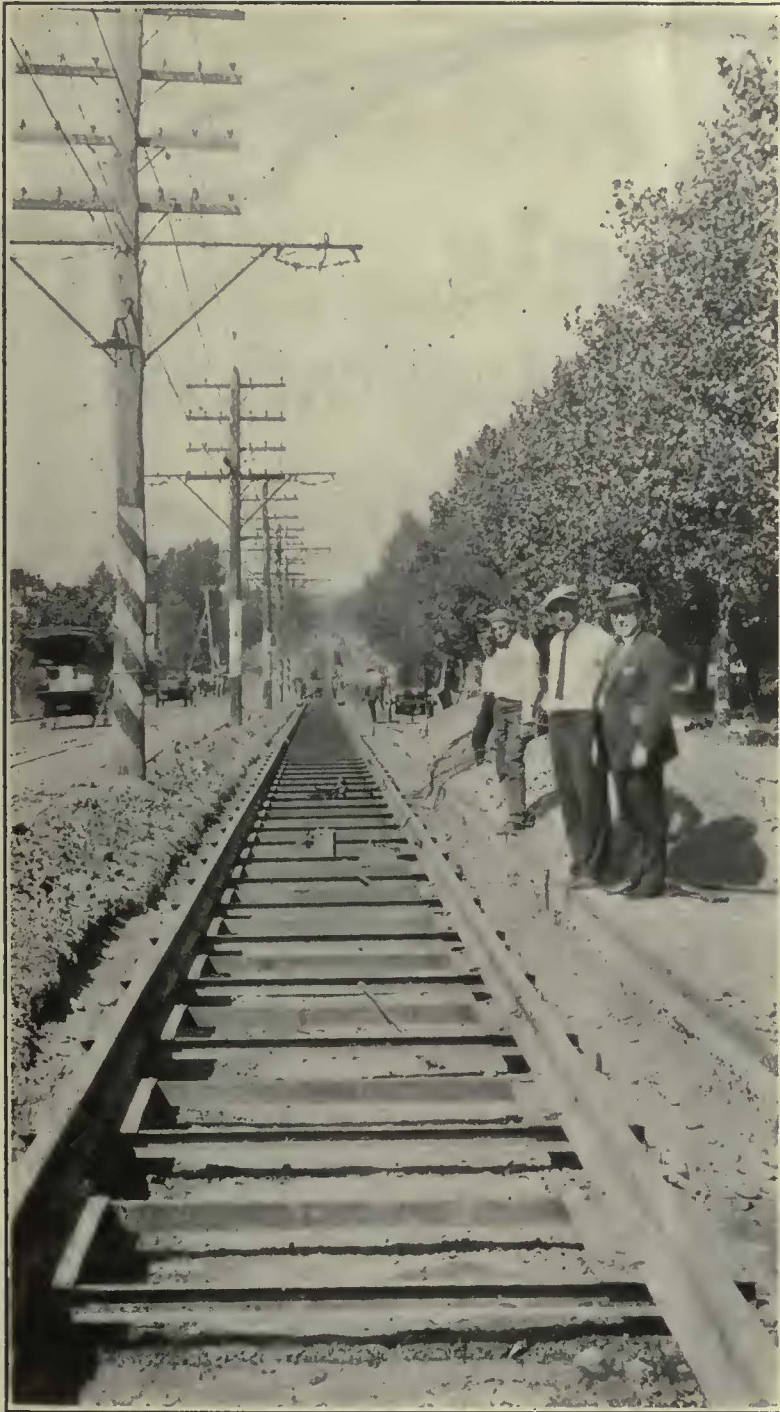
Dash Type for Railway Cars

The Golden Glow reflector will not scratch, tarnish or corrode. It is a permanent reflector and easy to keep clean.

Golden Glow Headlights are made in various styles and sizes to suit any requirements—for either cars or buses.



Golden Glow Headlights for
Railway Cars



Lay, Align and Surface Track for 43 cents a foot

A detail of the savings with Steel Twin Tie Construction is in the efficiency possible in the above operations.

The definite reasons for this saving, as compared with the cost with wood ties (often as much as twice this figure) are as follows:—

30 Per Cent. less tie weight to handle 880 Twin Ties as compared with 2,640 wood ties, each of approximately the same weight.

30 Per Cent. fewer rail fastenings than spikes of the jaw and key type which are quick, safe and simple.

No gauging required. Twin Ties come punched to exactly your rail and track gauge.

Labor of aligning reduced by Twin Tie construction method of blocking rail to approximate line, before fastening on ties.

This and many other advantages of Twin Tie Construction will save money on your 1926 track work.

Let us quote and send detailed track cost figures from 1925 work.

The International Steel Tie Company
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track—Permanent Foundation

Signals

and their Diversified Applications.

Have you more than scratched the surface to uncover available means of protecting and speeding up your traffic, and are you experiencing delays or perhaps accidents which might be eliminated by the use of one or more of the following means?



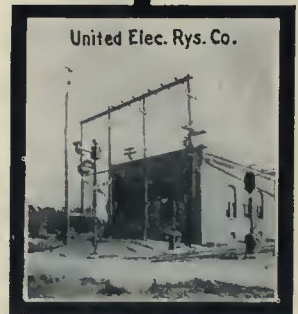
1.—Automatic semaphore or color light block signals, controlled by continuous track circuits.



2.—Electro-pneumatic, electric, electro-mechanical, or purely mechanical interlocking systems at terminals or at grade crossings with other railway lines.



3.—Highway crossing protective devices of flashing color light, wig-wag and audible types or combination of same.



4.—Remotely controlled switches at outlying sidings.



A statement of your problem places you under no obligation and if it appears to our engineers that your conditions can be improved by installation of our materials, we shall be glad to furnish complete details.



Electric Railways which are large users of Union automatic signal and interlocking systems are:

Chicago, Lake Shore & South Bend Ry. Co.
Chicago, South Bend & Northern Indiana Ry.
Kansas City, Clay County & St. Joe Ry. Co.
Washington, Baltimore & Annapolis Elec. R. R.

Interstate Public Service Co.
Pacific Electric Ry. Co.
Illinois Traction System
United Elec. Rys. Co.

Scranton & Binghamton R. R. Co.
United Railways & Elec. Co.
San Francisco-Sacramento R. R.
Northern Texas Traction Co.



Union Switch & Signal Co.



SWISSVALE, PA.

The Versatile Material—



WABCO Packing Cup



WABCO Cylinder Head Gasket



WABCO Triple Valve Gasket



WABCO Hose Coupling Gasket

By a process distinctively our own—developed through years of study, research, and experiment—we have perfected a special composition, called WABCO, which has proved to be superior to leather and ordinary rubber for gaskets and packings in air brake apparatus.

This material is unique in its ability to resist elements which have been found more or less destructive to all other materials used for the purpose. It has the basic characteristics of being compact and uniform, tough, durable, and will not become spongy and sticky as ordinary rubber does.

Furthermore, since the entire process is under our control, we are able to vary the physical content and treatment of WABCO material to make it suitable for a diversity of purposes, giving it the desired degree of toughness, resiliency, and resistance to destructive elements, such as oil, grease, and high temperatures.

WABCO products are graded into four general groups. Each group is manufactured under specifications adapted to provide the best combination to meet the exact requirements of the packing or gasket.

Ask our nearest district office for complete and specific information.

WESTINGHOUSE TRACTION BRAKE CO.

General Office and Works: WILMERDING, PA.

WESTINGHOUSE TRACTION BRAKES



Both illustrations show Super Service Welding Cable at the Albany Welding, Boiler and Machine Shop.



Vulcanized in steel molds under tons of pressure it withstands all kinds of abuse.

“Far Superior to other types of rubber sheathed cables”

“**W**E have used it on all manner of jobs such as welding steel tanks, steamboat boilers, and various emergency jobs. I am pleased to say that today the cable is in perfect condition, and apparently good for some years to come.

“The braided cables which we formerly used are not to be compared with your special Super Service Welding Cable, and we also find this product far superior to other types of rubber sheathed cables which we have used.”

This statement is taken from a letter from Mr. Ray Gaul, president of the Albany Welding, Boiler and Machine Shop, after his Super Service Welding Cable had been in use for three years.

You can't beat Super Service for wear, and its extreme flexibility eliminates the need for splicing on a separate length of wire for the electrode holder.

If you have never used Super Service get a length today and try it out.

ROME WIRE COMPANY

Mills and Executive Offices: Rome, N. Y.

Diamond Branch: Buffalo, N. Y.

New York—50 Church Street

Boston—Little Building

Chicago—14 E. Jackson Blvd.

Detroit—25 Parsons Street

Cleveland—1200 West 9th Street

Los Angeles—J. G. Pomeroy, Inc., 336 Axusa Street

San Francisco—J. G. Pomeroy, Inc., 51 Federal Street

SUPER SERVICE

CORDS and CABLES

2542

A ROME WIRE PRODUCT



TIMES SQUARE, NEW YORK CITY



FACILITATING TRAFFIC

WHEREVER National Pneumatic Door Operating Equipment is used on surface cars, subway or elevated cars, traffic is facilitated through the rapid interchange of passengers and a reduction in the standing time. A stationary car congests the traffic and produces no revenue. National Pneumatic Equipment not only saves money for the transportation agency but is welcomed by the public and by the authorities who are responsible for traffic movement.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

MANUFACTURED IN

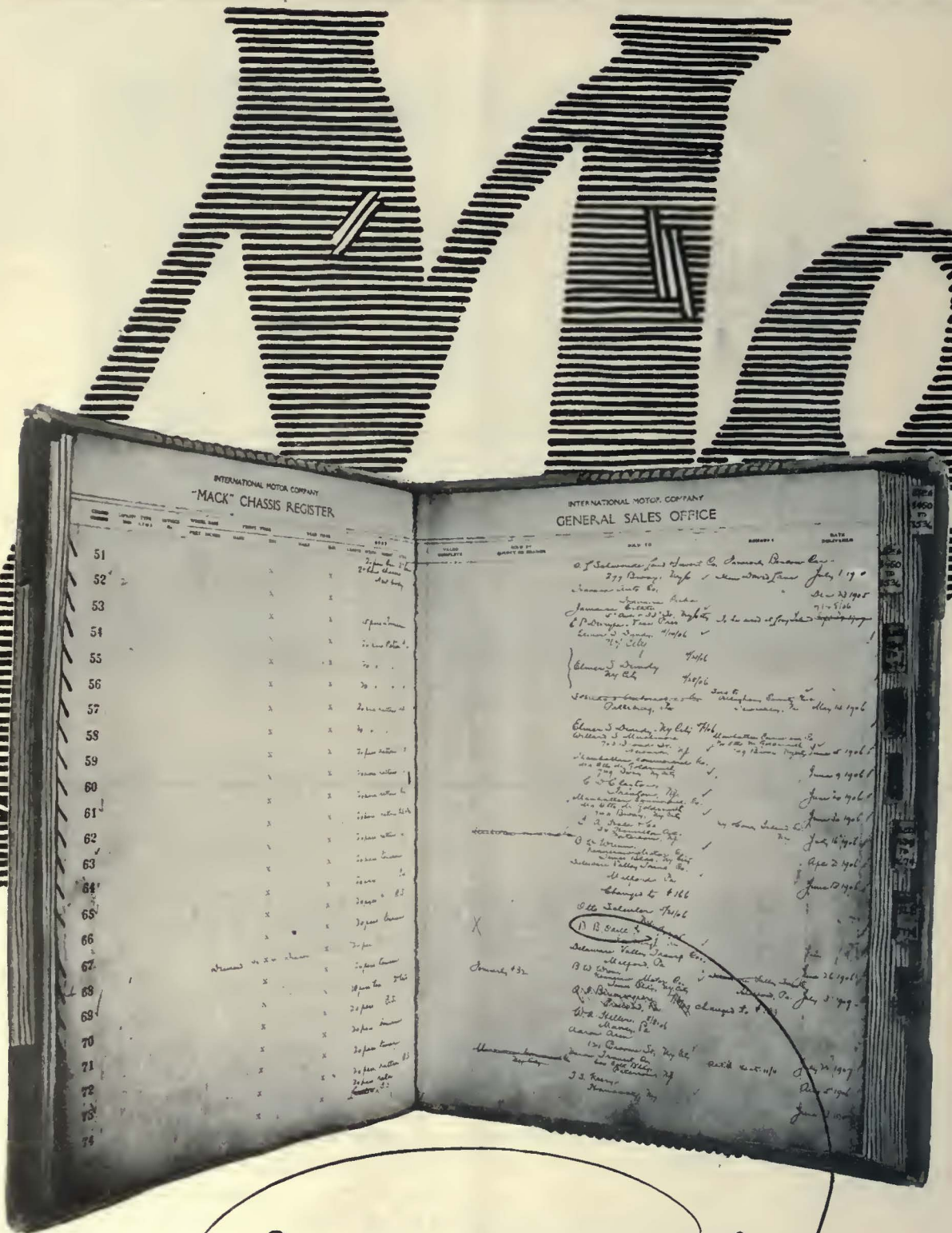
TORONTO, CANADA, BY

PHILADELPHIA

CHICAGO
518 McCormick Building

Railway & Power Engineering Corp., Ltd.

1010 Colonial Trust Building



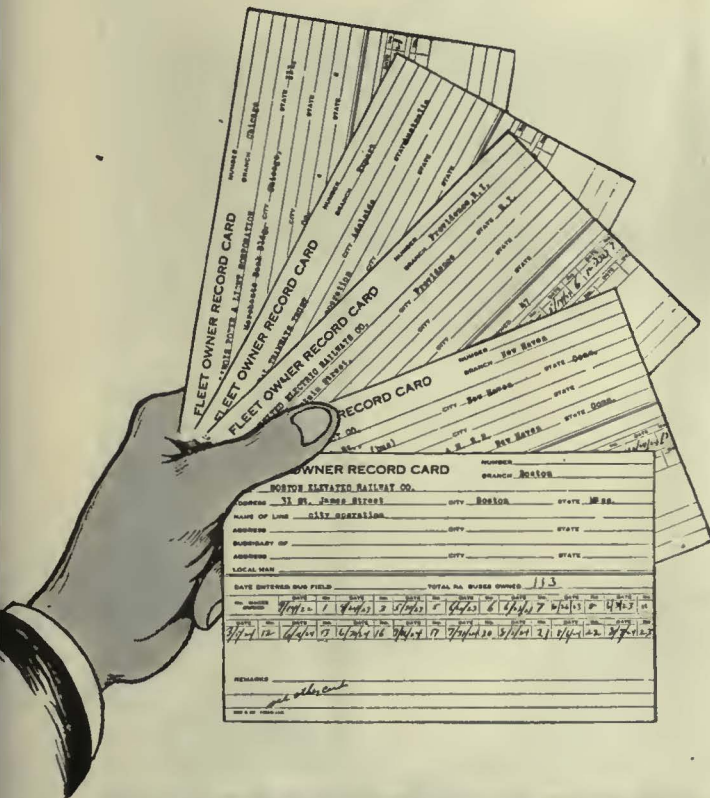
B. B. Odell Jr.

Away back in 1905 the name of B. B. Odell, Jr., appeared as a Mack customer on the pages of this old Mack ledger. Today, acting for the Newburgh City and Suburban Railway, Inc., the same name appears as a customer for Mack Buses.



What's behind
the Bus you buy?

Better records and better products



Times have changed. Just as Mack methods of keeping records have graduated from old entries in a ledger to the modern way of indicating sales transactions on a Fleet Owner Record Card, so has the design of the Mack Bus kept pace with the needs of modern transportation.

Better records and better products have developed in the Mack organization side by side. The business records used by Mack twenty years ago are as inadequate today as the early Mack buses when compared to Mack's latest models. Good in their time, both have outgrown the requirements of their day.

One thing is certain. As transportation methods establish new standards, Mack will meet them—with the right engineering design and with the right business records to keep track of all transactions and better serve fleet owners.

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 Broadway, New York City

Over one hundred direct MACK factory branches operate under the titles of: "MACK MOTOR TRUCK COMPANY," "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION," and "MACK TRUCKS OF CANADA, LTD."



International

For the Man Who Must Explain Pole Performance

DISTINCT advantages to be gained by the use of Creosoted Pine Poles are as follows:

Greatest Strength — Longer Life }
 Low Annual Cost — Fine Appearance
 Decay Proof — Lower Construction Costs
 Fire Resistant — Low Maintenance
 Resistant to White Ant Attacks

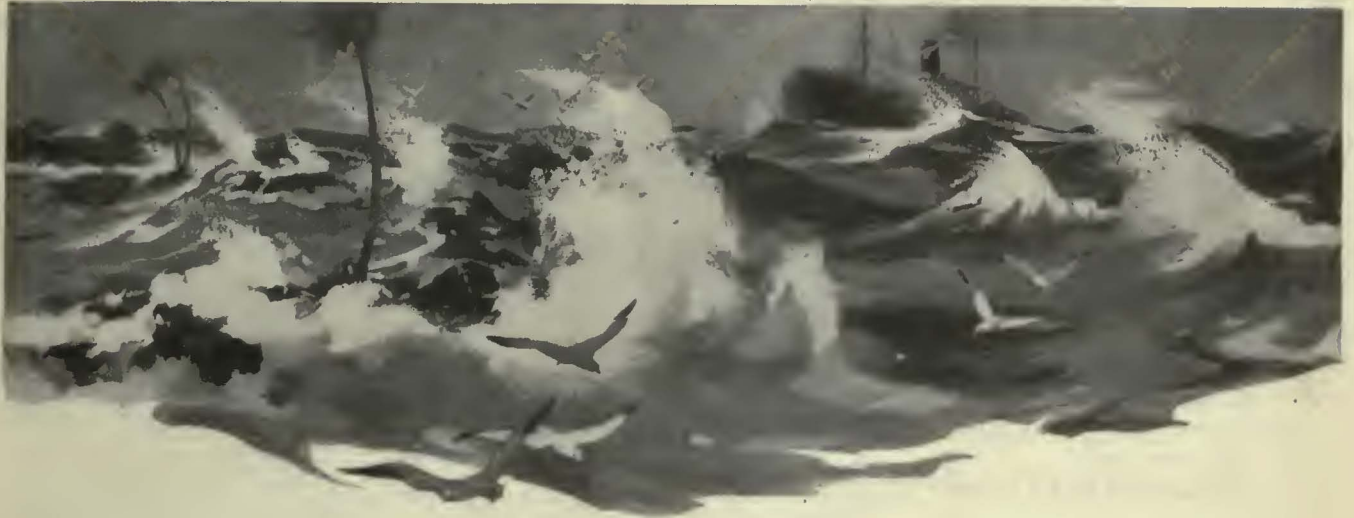
When you specify *International* Pine Poles, you are assured of sound timber — expert manufacture — uniformly deep penetration of high grade preservatives, plus an assurance of quality. And back of all this, an institution that stands for the best in timber preservation and that has fifty years of experience to back up its good work.

Every International Pole is permanently identified by this International Dating Nail.



International Creosoting & Construction Co.

General Office—Galveston, Texas
 Plants: Texarkana, Texas Beaumont, Texas
 Galveston, Texas



Multiply It By A Million

AN inoffensive piece of coral is too small to notice. But multiply it enough times and coral reefs hundreds of miles long are formed. The harmless individual has now developed into a real obstacle.

Considered by itself the removal, turning and replacement of one wheel seems insignificant.

But multiply that operation a million times and an appalling maintenance problem develops.

Expensive shops must be built, and skilled men assigned to run them; while revenue traffic becomes congested with needless movement of company material.

Control this situation before it gets out of hand.

If the wheels on your cars are Davis "One-Wear" Steel Wheels there is no wheel maintenance to be considered. Once under the cars they stay under.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

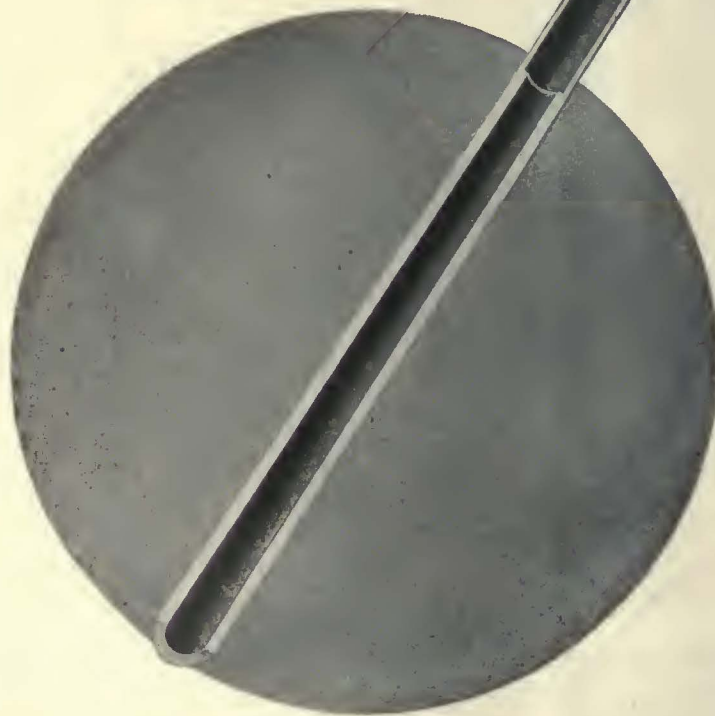
ST. LOUIS

"NATIONAL" SHELBY

SEAMLESS STEEL

TROLLEY POLES

Reinforced where reinforcement is needed, without adding superfluous weight or sacrificing resiliency.



THE standard "NATIONAL-SHELBY" Poles are made from 13-gage material, as years of practical experience have shown that a lighter gage may fail by local injuries, and a heavier gage simply adds to the weight of the pole without increasing its strength to a corresponding extent. The theoretical requirement for a pole of minimum weight points out a method for increasing the strength of the pole without a proportionate increase in the weight. This method consists of the use of a reinforcement at the base end, and on the inside of the 13-gage member.

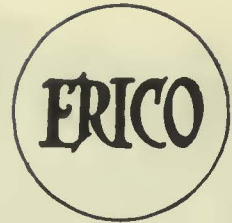
These poles are made by improved methods of manufacture, particularly in the method of inserting the reinforcement. The reinforcement is integral with the body of the pole, which adds materially to its efficiency.

Ask for Booklet—The "SHELBY" Seamless Cold Drawn Steel Trolley Pole.

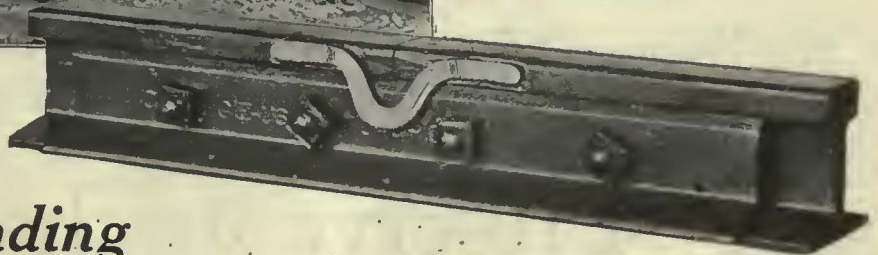
NATIONAL TUBE COMPANY, PITTSBURGH, PA.
GENERAL SALES OFFICES: FRICK BUILDING

DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul
Pacific Coast Representatives: U. S. Steel Products Co. San Francisco Los Angeles Portland Seattle
Export Representatives: U. S. Steel Products Co. New York City



The Type SR Bonding Outfit installing Brazed Bonds on the head of rail.



***Inexpensive,
reliable bonding
on the head, web, or base of the rail***

Heretofore much of the expense of rail bonding has been due to interruption to traffic during the bonding operation. Not only have car schedules been upset, but much of the time of the bonding crew has been wasted simply waiting for traffic when they should have been applying bonds. The expense involved in delayed schedules and wasted time is, of course, hard to figure, but it can be readily seen that by eliminating this item, the cost of bonding could be greatly reduced and the time involved materially lessened.

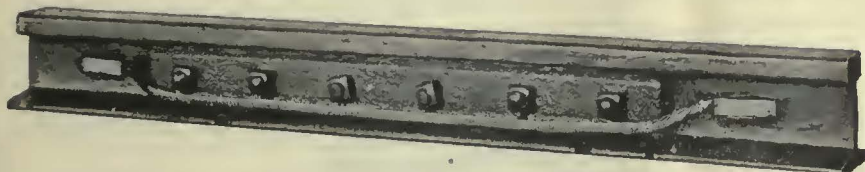
The light weight and convenient size of each element of the Type SR Bonding Outfit permits almost instant removal of the equipment. Where headway is short, the equipment can be kept off the track except when moving from joint to joint. The only part that engages the rail during the appli-

cation of Brazed Bonds is the Welding Furnace, which can be removed from the rail instantly, with one hand. By proper manipulation of the Welding Furnace, bonds can be installed in one and a half to two minutes. A crew of three men, with the Type SR Bonding Outfit, can install as high as twenty bonds per hour.

Two interchangeable rail mountings can be furnished for the Welding Furnace. The Standard mounting has adjustments for bonding either the head, or the web of the rail. The Type B Base Mounting inclines the Furnace to install bonds on the top of the base of the rail. The latter method is ideal for cross and special bonding. Where extensive head of rail bonding is required, time will be saved by using an extra Welding Furnace equipped with Type B Mounting for installing cross and special bonds on the rail base.

There's really no good reason why you should pay MORE for bonding LESS sure than Brazed Bonding—is there? We will be glad to send data and prices, without obligation, to whomever you request.

The Electric Railway Improvement Co., 2070 East 61st Place, Cleveland, Ohio.



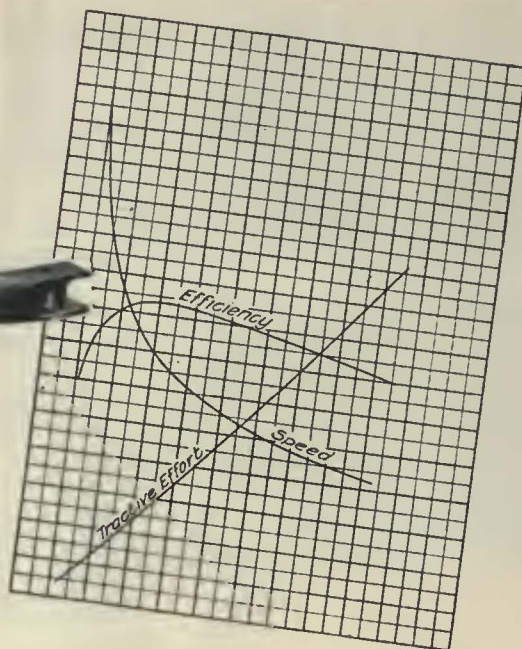
Type E Brazed Bond for bonding around the joint, or around special work. This bond is also applicable to installation on the top of the rail base.

Concealed Brazed Bonding is simple. Type EC Bonds are made for any bolt spacing, and in balanced or unbalanced conductors to clear almost any fish plate.





Your G-E Railway Motor



Preserve its characteristics

To obtain the best commutation, the brushes for a railway motor should be selected with full knowledge of the motor characteristics.

Only the General Electric Company possesses complete design data pertaining to your G-E Motors. The brushes recommended for them by G-E motor experts will insure the best service—and at lowest cost.

Preserve the characteristics of your G-E Motors and you guarantee continued successful operation. To do this, G-E Brushes, of *original equipment quality*, are essential.



What is true regarding the importance of proper brush selection in preserving the characteristics of your G-E Motors applies with equal emphasis to the purchase of all motor parts. The only safe procedure is to specify G-E Renewal Parts for G-E Motors.



For
Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of *Street Railway Journal* and *Electric Railway Review*

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 67

New York, Saturday, May 1, 1926

Number 18

Readjustment to Permit Financing Through Holding Company

FINANCING to the extent of \$65,000,000 done recently by the Associated Electric Company, the largest and most important subsidiary of the Associated Gas & Electric Company, has been attracting attention in the investment field. Included among the properties controlled are several electric railways. The new issue consisted of 5½ per cent convertible debentures sold to yield more than 5.90 per cent. The proceeds are intended to retire various high-rate securities and effect a substantial saving in the aggregate annual interest charges. The refunding constitutes the first step in the simplification of the capital structure of this group of properties. Incidentally the amount of outstanding issues retired under the new financing was \$35,846,970, this sum including \$5,873,620 of preferred stock. Interest in the operation and its success centers, however, in the purposes behind the issue. Perhaps the most important point is that the makers of the new instrument intend in the future that the operating companies of the Associated group will raise money through the holding company and will not themselves go into the market.

Just how far, if at all, the basic ideas behind the new issues are applicable in the electric railway field is a matter for the financial technician to decide, but it does appear that some of the ideas behind the new issue are in keeping with the suggestions made last year by the advisory committee of the American Electric Railway Association appointed to inquire into the question of financing. The changes suggested by the committee contemplated in some instances a major financial operation. That, of course, was for the extreme case where possible earnings were out of line with the then existing financial structure. These are the rare cases. There are others, however, in which the applications of the principles set forth by the committee can be made a continuing process.

The Pittsburgh Railways furnishes an example of this kind. That company, for instance, came out of receivership with much the same myriad of separate companies that went in, but that company, continuing the plan of eliminating subsidiary corporations where practicable, closed out or merged last year with other subsidiaries sixteen companies. Moreover, the process of retiring bonds is being kept up unremittingly. During 1925 sinking fund retirements totaled \$1,210,600, bond retirements \$219,000, and total redemptions \$1,621,200. Doubtless there are other similar instances, but this one comes to mind in connection with the work of digesting the report of the company for publication in a recent issue of the JOURNAL.

It will not do to dismiss the matter by saying that Pittsburgh is now operating under an agreement that insures to it favorable terms for financing. Many electric railways enjoy an excellent credit rating. They enjoy it because they deserve it. All of them should.

But before they do, many of them will have to undergo the drastic financial rearrangement which the committee prescribed for them. The readjustment isn't easy to accomplish. The committee made that plain. Whether or not any of the principles embodied in the Associated Electric financing offer suggestions, such readjustments in finances and in corporate structure as are needed can be carried out. Pittsburgh proves it.

Far-Sighted Transportation Planning Has Made Real Co-ordination Possible

BOSTON is proverbial for the difficulties encountered by strangers in finding their way about. In so far as this condition really exists, it results from the narrow and winding character of the streets in the business district. The local transportation system, on the other hand, has been laid out along lines that are essentially simple and easy to understand. While the actual execution of plans has been hampered by certain physical handicaps and has deviated somewhat from the ideal, results have been attained that are well worth study by any transportation man not already familiar with them.

Subway, elevated, surface car and bus services have been co-ordinated in the city and neighboring towns by the Boston Elevated Railway, as told elsewhere in this issue in an article by Edward Dana, general manager of the system. In a general way, it may be said that east-west and north-south rapid transit lines have been built along the routes of heaviest travel, extending as far as justified by the volume of traffic. Surface car lines radiate from the rapid transit termini into the outlying districts. These surface car lines also serve important intermediate areas where traffic does not warrant rapid transit train operation. By placing the tracks in reserved strips in the centers of the streets and operating three-car multiple-unit trains, service approaching that of the subway and elevated lines is attained on the surface. Downtown the street cars have been placed underground in subways built at great expense, thereby gaining advantages in directness of route and speed of operation that would be impossible on the narrow streets of that district.

During the last few years the bus has been added to the transportation facilities provided by this company. Its development has been rapid. At present the company is operating 190 buses on 25 routes. Bus traffic represents about 7½ per cent of the total carried by the system in the outlying districts. The bus has replaced the street car on some light traffic routes. Crosstown routes have been established connecting the radial rapid transit and surface car lines. More recently, bus service has been extended into the downtown business district to take the place to some extent of the cars which have been placed underground.

The narrow, winding streets which in the first place

hampere surface transportation in the end necessitated the construction of the subways, which to some extent ignore rambling routes and follow directly the lines of travel. The advent of the bus has made it possible to round out the local transportation system by taking care of certain kinds of traffic the volume of which was not large enough to justify rail operation. It would be going too far to say that the present transportation system in Boston is perfection, but it undoubtedly furnishes a noteworthy example of co-ordinated subway, elevated, surface car and bus service.

Competition Has Tangible Advantages for the Individual

COMPETITION for prizes has been looked on for ages as one of the best means of building character. Under the spur of the contest much more thought and effort will be given to the preparation of plans and perfection of methods than when only the dull routine of everyday affairs is considered. As a means to an end, then, a well-organized contest has a very decided value. Nor is it necessary to be the winner in order to get great benefit out of participation. Every contestant is the better for having taken part.

Competition demands extra thought, extra time and often extra expense on the part of the individual. The sacrifice is often looked on merely as a labor of love, with little hope for any reward save the satisfaction of work well done. But sooner or later it is bound to pay in a more material sense. Take the case of the men who have been active in the past Coffin Prize contests. Many of them were little known in the industry before they entered their companies in the lists. Few stood out in contrast to others. Today several of these men have taken a new and commanding position in the field. They have absorbed a new enthusiasm, a new comprehension of their work. In a number of cases this has led to a very tangible reward in promotion by their own organizations to more important positions. Others have obtained increased recognition in their old positions.

These are elements that should be taken into account by any manager who has doubt in his mind as to his ability to make a good showing in the Coffin Prize competition. The decision to enter is fraught with no danger whatever. For the individual who plans the campaign and places his company in the competition there is most certainly a reward in sight—not only the intangible one of personal satisfaction, but recognition from his superiors and from men in the field generally.

The Product Is Judged Rather than the Means

SOME there are who think they have discovered a royal road to riches. That is evidenced by the large number of persons who visit Monte Carlo each year. A similar tendency toward a gambling spirit may be noted in the case of certain transportation men who, having failed as street railway operators, believe that they can turn to the bus and retrieve their losses. Without giving proper thought to the correct locations to place it, or as to its proper use, they plunge ahead with the feeling that the word "bus" by itself will at once be the open sesame to greatly increased traffic and reduced expenses. Nothing could be more fallacious.

Whether the transportation vehicle be run on rails

or on rubber, there are certain laws which govern the operation and which must be observed. Transportation is the product delivered. While there may be a small gain in the number of passengers carried at first when buses are installed, due to the novelty and the curiosity of the public, after the newness is worn off the appeal must be that of good transportation, just as it had to be with the street car.

In the long run, just as much transportation sense is needed to get the public to ride buses as should have been used to get them to ride cars. The bus, of course, has an inherent advantage in that an error in routing can be corrected at less expense than when rails have been laid. It is necessary, however, for the operator to discover whether the routing has been decided on correctly and whether the schedules are fitted to the traffic if satisfaction is to be given to the riding public. And, of even greater importance, the public must have the knowledge that its wishes are being given consideration, no matter what vehicle is used.

Safety Zones Present and Future

SHOULD the next census contain an enumeration of developments which have shown great increases during the last few years, it will undoubtedly include safety zones, along with automobile registration, Florida real estate activity and bootlegging.

For many years a very few raised platforms near the foot of Market Street, San Francisco, were practically the sole examples in this country of space reserved in the street for electric railway waiting stations. It is necessary to mention this fact only to disclose the difference between past and present conditions. Now, raised platforms for the safeguarding of persons boarding or alighting from street cars are common from Newark, N. J., to New Orleans, La., and from Jacksonville to the Pacific Coast. Their desirability is generally acknowledged for all situations where the traffic is considerable and the street on which tracks are laid is wide enough to accommodate platforms of this kind. In Detroit some of these platforms even have roofs so that persons waiting for the cars will be sheltered from the weather. There has also been a very great increase of substitutes on the street for these raised platforms, such as areas protected by permanent or movable posts, illuminated hemispherical guards and even painted lines. Indeed, there is hardly a city now so small but that has in its principal street at least one stopping point with some kind of protection for electric railway passengers.

With the merits of the safety zone generally accepted, there are some who believe the public should be guarded even further, and in Detroit it has been suggested that underground passageways be constructed between curb and island platforms to eliminate the dangers of crossing on the surface of the street. Still another plan is a co-ordinated service of buses and trolleys in which the buses would stop every block or two and carry passengers to and from the express stations of the electric railway in the center of the streets.

These proposals indicate a prevailing impression that in busy streets persons passing between car and curb run considerable danger of being injured by vehicles. Indeed, this hazard is usually strongly emphasized by nearly every bus advocate in arguments as to the relative merits of the bus and electric car in city service.

Actually, the danger of such a passage is usually very slight. Pedestrians crossing from one curb to the other run twice the risk because they have twice as far to go, so that if the trip half way across the street to the safety zone is as dangerous as some persons would have us believe, the trip across the entire street should be prohibited.

As a matter of fact, there is no great danger from either kind of crossing, if made at the proper time. Whether a busy intersection is protected by traffic officer or signals, cross traffic must be permitted at intervals, and it is then that pedestrians are able to make the passage. When there are superhighways without grade crossings, as suggested for Detroit by D. L. Turner, there is time to make provision so that pedestrians may cross on a separate level from vehicular traffic. But that time is far distant in most cities.

Cheap Taxicab Era Ends in New York

EXPERIENCE during the last year and a half has taught the taxicab operators in New York City that the 20-cents-a-mile rate does not produce sufficient revenue to afford them a living. When this low rate was first established, few impartial observers thought that it would be a success. An editorial in this paper for Aug. 2, 1924, predicted that it would prove unprofitable. That prediction has now come true. On May 1 the rates of several companies are to be increased to 35 cents for the first mile and 25 cents for each succeeding mile.

Thus ends another dream of doing a street railway transportation job with some other type of vehicle. It was thought in certain quarters that the taxicab rate of 20 cents a mile with no extra charge for additional passengers would take away a considerable volume of traffic from the established transportation agencies. A group of four people, it was said, could travel just as cheaply by taxi as by street car. The unsoundness of this theory from an economic point of view is evident to any one who compares the relative operating costs of the two types of vehicle. No noticeable loss of traffic has been sustained by the electric railways during the low-rate period. Now the taxicab operators themselves have discovered the mistake in their reasoning and raised the fare. The much-maligned street railway is left without a competitor in providing cheap surface transportation.

That Vanishing Automobile Saturation Point

WE WHO are interested in increasing the business of local transportation agencies have long been anticipating the saturation point of sales in the automobile industry. Ten years ago, in common with most of the automobile industry men themselves, it was generally felt that the saturation point was just around the corner. Years went by, but sales continued to increase. Then it was thought that soon there would be one car in every family, and that surely would be the saturation point. Now there seems some basis for thinking that perhaps there is no saturation point. Instead of one car it is getting so there is a whole "gasoline alley" for each family. Father has his limousine. Mother has her Victoria coupé. Brother has his playboy and sister her brougham. Junior has his flivver—and no one stays at home.

While this vanishing saturation point has been flitting just over the horizon, we are now suddenly given the final blow when we read in Henry Ford's new book that "with our present capacity of 2,000,000 a year we are able to meet the needs only of our present owners if they should each buy a new car every six years."

Ponder that!

The miracle of it all is that the total number of riders on the street railways is higher every year—at least the trend is upward. There is also a natural stabilizing force working against the increased use of individual cars. You may keep on multiplying the number of automobiles sold, but the amount of parking space available is practically fixed. As this becomes less and less adequate to take care of the demand and as the streets and highways become increasingly congested, more and more of the automobile owners tend to revert back to common carrier agencies. But to build regular patrons from occasional riders, it certainly does behoove the railways to concentrate on improving service. More is expected of them than was ever the case before the advent of the automobile.

Regulation by Taxation Is Unsound

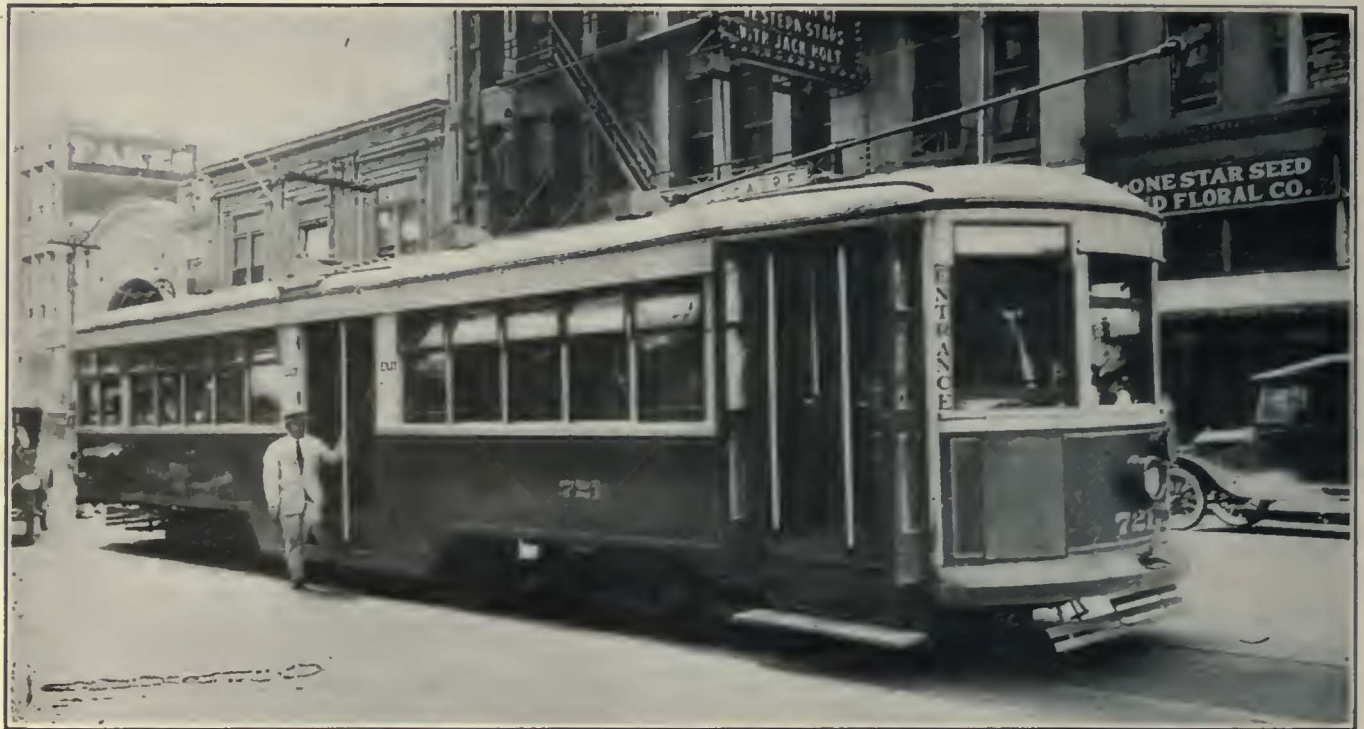
"COMMON carrier motor vehicles should pay a fair and reasonable tax for the use of the highways, but regulation should not be attempted through taxation." Here, in the words of Ralph Budd, president of the Great Northern Railway, speaking recently in Kansas City before a meeting of the American Society of Civil Engineers, is a principle worthy of most careful consideration.

Such a viewpoint may well be adopted by every transportation executive. Loading the bus down with taxes is not the right form of regulation. The transportation man who advocates heavy taxes for buses is indeed living in a glass house. Transportation as a whole now carries an undue and unfair tax burden. Many electric railway companies pay more in taxes than they earn in net revenue. There is a tendency in the public mind to look with favor on any proposal to increase taxes on a public utility company.

Although there has been much competition between buses and electric railways under most inequitable conditions from the standpoint of taxation, it is a short-sighted expedient to advocate heavier taxes for buses as the remedy of the situation. Such a policy makes more difficult the problem of getting relief for the railways. Regulation should be by other means than taxation.

Relief for the railways should be approached on a different basis. Taxing the bus heavier will not result in lightening the burden of the railway. Experience during the past few years has shown that when a bus competitor is heavily taxed, the taxes come along with his buses when he is absorbed to form a co-ordinated system.

In the sense that transportation is a public benefit, present heavy tax loads on electric railways are definitely a burden on the public. That is the basis on which the local transportation tax situation must be approached and presented to the public. For one transportation agency to favor increased taxes on another because they are temporarily in competition weakens the whole case before the public. Therein lies the wisdom of Mr. Budd's statement.



Exterior of Peter Witt Car Used in Dallas. Thirty More Will Be Purchased in Compliance with the New Ordinance

Dallas to Spend \$1,500,000 in Service Extensions

Arbitrary Fixed Fare Theory Broken in New Franchise Amendment that Establishes a 7-Cent Fare—Company Will Spend More than \$1,000,000 This Year for New Cars, Track and Paving, and Nearly \$500,000 to Retire Temporary Loans for Work Completed or Under Construction

DALLAS, TEX., has broken another fixed fare theory of bygone days. On April 7 the City Commission passed an ordinance establishing a 7-cent fare with five tokens for 30 cents to remain in effect until changed by order of the commission. It is of particular interest to the Dallas Railway that the people of that city and its commission established in this ordinance a rate basis that recognizes a fair return on a fair valuation, without regard to the 5-cent fare which was established in the 1917 franchise, which in turn will open the doors of investment channels so as to allow the company to make the extensions and improvements much needed to provide adequate service in this fast-growing metropolis of the South.

Of immediate value to the city is the agreement of the company to follow out the program of expenditures equaling nearly \$1,500,000, outlined by Supervisor of

Public Utilities John W. Everman. This budget includes nearly a half million dollars for the repayment of notes and car trust securities covering expenditures for improvements and cars purchased during the last two years by the company in anticipation of the final settlement of this franchise. Some of this money was borrowed from the company's reserves.

More than \$1,000,000 remains to be spent in accordance with the program that is given in the table on page 751.

Thirty new Peter Witt cars, similar to those now in operation, will be purchased immediately, and 50 other cars will be rebuilt for one-man operation. This requires the installation of safety devices, including rear door exits equipped with a treadle device. It is planned to expend an additional amount in excess of the franchise budget in the construction of several new cars in the company's



Interior View of Dallas Peter Witt Car



Exterior of Earlier Type of Car, 50 of Which Will Be Changed Over for One-Man Operation. Complete One-Man Safety Features Will Be Used and Automatic Treadle Equipment Will Allow Rear Exit Operation

shops. The plans for these cars are now being developed.

Of particular interest is the construction of 5.43 miles of new track as extensions to six different rail lines into territories that have been served in the immediate past by buses. This is one of the earliest replacements of this kind that has been made in line with the theory generally adopted in recent years that the bus is useful to serve new territory as a forerunner to the railway

extension. The buses thus replaced will be used as further extensions or on new routes as conditions warrant.

Something over \$400,000 will be used for paving projects on car line streets that will be repaved by the city during the year. Approximately \$115,000 will be used to rebuild three railway lines which are a part of Everman Plans one, two and three.

Partly due to extensions and partly to improve the present overhead distribution system \$35,000 will be spent for new feeders and equipment. Since the company purchases direct-current power no new substation equipment is contemplated in this budget.

In the event that the estimates for work to be done prove more than necessary the company has agreed to expend any moneys so saved for further extensions and betterments as may be directed by the supervisor of public utilities.

Since the passage of the new fare ordinance the company officials and staff have been busy with the details of the work to be accomplished in the next few months.

For several years the company has operated on a flat 6-cent fare granted for brief periods of a year or eighteen months at a time. These fare grants have

ANALYSIS OF EXPENDITURES AT DALLAS

Equipment:	
Pay balance due on car trust certificates for 30 new cars in March, 1924	\$137,484
Purchase of 30 new Peter Witt cars.....	450,000
Re-equipping 50 double-truck cars with modern appliances for one-man operation	50,000
Total equipment expenditures	\$637,484
Power:	
New electric feeders and improvements in distribution system	35,000
Way and Structures:	
Extension of track on six lines. Service heretofore rendered by buses, but traffic thus developed now renders rail extensions advisable	194,000
Rebuilding track on three lines	115,000
New paving required by city	434,814
Total way and structures.....	\$743,814
Contingencies	50,000
Grand total	\$1,466,298



Interior Views of a Two-Man Car Changed Over for One-Man Operation. Dallas Plans to Change Over 50 of These Cars

been given in exchange for certain improvements agreed to by the company and have been the basis for the three Everman plans. While this has helped to give the company a much-needed increase in gross revenue, uncertainty of the continuance of the higher fare* precluded the possibility of permanent financing. Both the city and the company suffered from this condition.

It is felt by the management that this amendment will make possible the issue of bonds to cover the major portion of these new expenditures, and of preferred stock to cover the balance, on a favorable basis because of the stability thus offered by this new amendment.

It is yet somewhat of a conjecture as to the relative

split between full 7-cent fares and 6-cent tokens. The proportion of full fares immediately following the increase averaged about 39 per cent of all revenue fares. It will naturally take several months to determine what the ratio of full fares to token fares will ultimately be. Children and school students are entitled to half rates according to the franchise. The school tickets must be purchased at the company's office on certificate from the proper school authorities stating that the applicant for such reduced rate transportation is a bona fide student of a recognized school. Reduced fare tokens are sold by the conductors or at the company's offices in lots of five for 30 cents.

Abstract of Dallas Railway Ordinance Adopted April 7, 1926

Now, therefore, be it ordained by the board of commissioners of the city of Dallas:

Section 1. That from and after midnight of the day and date this ordinance becomes effective and subject to and in accordance with the terms, provisions and conditions of the aforesaid franchise ordinance of 1917, and upon conditions that the railway company does and performs promptly and with reasonable diligence, those things required to be done by it by the above recited report of the supervisor, and as and when ordered and required by the board of commissioners and supervisor of public utilities of the city, except that instead of agreeing to furnish from time to time \$1,000,000 of new money as required by said report of said supervisor, the railway company shall furnish and pay said \$1,000,000 into the treasury of the railway company before the acceptance of this ordinance by the railway company, the railway company is hereby authorized to charge and collect rates and fares in accordance with the schedule hereinafter set forth until such time as the board of commissioners, after a hearing had upon its own motion, or upon application of said railway company, shall by ordinance or resolution change said rates, said schedule of fares being as follows:

1. A maximum fare of 7 cents for all persons twelve years of age or over, provided five tickets or tokens shall be given for a cash payment of 30 cents.

2. The fare for children between the ages of five years and twelve years shall be 3 cents to be dropped into the box on the car.

3. Students not above seventeen years of age of institutions of learning as defined in the general laws of the state of Texas relating thereto, shall be carried for the half fare provided for by the state law upon the presentation of tickets to be provided and purchased at the Dallas Railway Company's office by persons exhibiting identification certificates and entitled to such reduced fare.

4. That children of five years of age or less when attended by passengers above said age shall be carried free on the cars of said railway company.

5. That all tickets or tokens issued under the former rate by the railway company and which are unused and in the hands of bona fide owners shall be honored by the said Dallas Railway

Company and its conductors and operators until all such tickets or tokens have been used, as a cash fare under the rate herein authorized.

Section 2. That the railway company shall issue tickets or tokens in convenient amounts under the rates herein authorized and place the same on sale in accordance with the directions of the supervisor, and unless otherwise directed by the supervisor, such tickets or tokens shall be required to be kept for sale to each passenger by each conductor on cars having conductors and by the motorman on cars having only motormen.

Section 3. Free universal transfers shall be issued by the Dallas Railway Company in the manner and in accordance with regulations now in force.

Section 4. Out of said \$1,000,000 new money so to be placed by the railway company in its treasury before accepting this ordinance as hereinbefore provided, the reserves provided for by said franchise ordinance of 1917, and now depleted as by said supervisor's report set out, shall be replenished. For the purpose of doing the things required of it, the aforesaid report of the supervisor and this ordinance, the railway company shall use that portion of the aforesaid million dollars not necessary to replenish said reserves, the money out of said \$1,000,000 used to replenish said reserves and likewise any money in said reserves immediately prior to the acceptance hereof, and that may accumulate in said reserves during the doing of the work required of said railway company by aforesaid report and this ordinance, and not immediately required for other purposes, for which said reserves were created. If aforesaid moneys are not sufficient to do all the things required by said report to be done, then said railway company shall and does by the acceptance of this ordinance, agree to furnish such additional new money as shall be required to complete said things to be done by it as aforesaid. Said additional new money shall be furnished as and when the board of commissioners or supervisor shall direct or require. If the cost of doing the things to be done by the railway company under said report is less than \$1,450,000 the railway company by the acceptance hereof obligates itself to expend the difference between such cost and \$1,450,000 in making such other and further extensions, betterments, improvements, re-

pairs and replacements not included in aforesaid report, as the board of commissioners or supervisor may direct, and if the said \$1,000,000 together with the reserves now on hand and hereafter accumulated to the date when said work is completed, do not amount to as much as \$1,450,000, then said railway company by the acceptance hereof, agrees to furnish such amount of new money as with said \$1,000,000 and said reserves will make the sum \$1,450,000. The amount to be allowed said railway company for property value for the furnishing of the above mentioned new money and doing the things required to be done by aforesaid report, shall be determined by said franchise ordinance of 1917.

Section 5. Nothing herein shall be construed as waiving, modifying, altering, changing, enlarging, diminishing or abrogating as to the city, the railway company, or any other person or corporation, the several terms, provisions, covenants and conditions of said franchise ordinance of 1917, save and except that until otherwise ordered by the board of commissioners as herein provided, the railway company shall be authorized to charge and collect the fares herein specified.

Section 6. The ordinance passed on Jan. 19, 1925, extending the 6-cent fare for a period of eighteen months, and all other ordinance and parts of ordinances in conflict herewith are hereby expressly repealed.

Section 7. This ordinance shall not become effectual unless and until the railway company shall within ten days from date hereof file its written acceptance of the terms and conditions hereof and obligate itself to be bound thereby and shall before the filing of such acceptance place in its treasury the sum of \$1,000,000 in new money.

Section 8. The urgent demand for increased street car facilities and the street paving improvements and the great improvement specified in such supervisor's report in order to provide adequate transportation facilities for the people of Dallas, creates an urgency and an emergency in behalf of the public peace, health and safety that requires this ordinance to become effective immediately; and it is, therefore, accordingly hereby ordained that this ordinance shall become effective immediately upon its passage as in the charter in such cases made and provided. Passed April 7, 1926.



Every Automobile Driver on Entering Birmingham on Any of the Principal Highways Must Pass Two Signs Like This

Campaign for More Traffic Brings Results in Birmingham

The Direct Method of Advertising Included the Use of Newspapers, Billboards, Car Signs and Moving Picture Reels—Coincidentally Efforts Were Made to Improve the Service in Many Ways—Trainmen Enlisted as Ride Salesmen

NO DOUBT exists in the minds of the officers of the Birmingham Electric Company of Birmingham, Ala., that the special campaign for traffic which it has been conducting during the past eight months has brought results. Strictly speaking, the campaign has been broader than one for mere business only. It has included equally strenuous and effective efforts toward improved public relations, particularly in the direction of acquainting the public with the problems of public utility operation, of making them realize that the purpose of the company and of its officers is to serve them, and bringing the residents of Birmingham into partnership in the enterprise. This latter purpose has included the sale to customers of a certain amount of 7 per cent preferred stock. The company now has more than 3,000 stockholders among the citizens of Birmingham.

But action by the company has not ended with the sale of this stock. Coincidentally there has been a strong effort to improve service in every way possible, to convert automobile users into passengers and to bring home to the public the fact that the Birmingham Electric system is being operated by citizens of Birmingham for citizens of Birmingham.

CHANGING THE AUTO DRIVER INTO A RIDER

The good roads about Birmingham and the practical absence of snow in winter encourage the use of private automobiles to a great extent. One feature in the cam-


campaign to change the private automobile user to a car rider when he uses his car in preference to the trolley is a series of large billboards placed at points on the highways entering the city where they will attract the attention of the automobilist. All of these boards carry the slogan "Use the Street Cars," coupled with some other injunction, changed from time to time, like "save the difference," "avoid parking troubles," "they are safe," "they are reliable," "save time, worry and expense," "avoid traffic troubles."

Altogether there are 21 billboards used for this purpose. Two of them are 10 ft. x 50 ft.; the others are 10 ft. x 24 ft. There are nineteen additional painted boards of similar type, using a red background with white letters. The larger billboards are illuminated at night. Every automobilist entering town on any of the principal highways must pass two of these boards.

In its regular advertising space which it carries in the daily papers in Birmingham, as well as in all the weekly papers published in the county, the company has also given considerable space to the private auto user. In these advertisements the trouble in securing parking space has received attention, as two of the advertisements reproduced illustrate.

Dash and window signs are used extensively for the same purpose. With single-end cars the dash signs are carried on the right-hand side of the car in front and rear. The lettering is similar to that used on the billboards. A popular window sign is a series of narrow

Introducing
T. G. Brabston



Superintendent
of
Transportation

Mr. Brabston has been connected with this Company since September, 1899. He is in direct charge of Transportation and on him has been placed the great responsibility attached to public transportation in this District of approximately 225,000 inhabitants.

This Department, with its organization of about 725 men, is endeavoring to give first class railway service, to keep accidents down to a minimum and to in general make the Birmingham street railway system the best in the South. Mr. Brabston appreciates receiving suggestions with respect to the affairs of his department. His day telephone number is Main 3705—telephone No. 41.

Birmingham Electric Company

Introducing
A. Taurman



Superintendent
of Equipment,
Ways and
Structures

Mr. Taurman has been in charge of the Company's rolling stock, equipment and structures for the past five years. Before coming with this Company he, for many years, held a similar position with the Virginia Railway & Power Company, in Richmond, Norfolk and Petersburg, Virginia.

In Mr. Taurman's department there are some six hundred employees engaged in the maintenance of street cars, tracks, service trucks and other equipment.

There are approximately three hundred street cars required in the service. Each day these cars must be washed, inspected and such repairs, as needed, made. The track crews are kept busy, continuously throughout the year, building up and improving the roadways. It is also necessary, that some sixty-five service trucks, used in connection with the rendering of gas and electric service, be kept in shape for daily use. Mr. Taurman is anxious for this equipment to go into daily service in such perfect shape that our patrons will suffer the least possible inconvenience from its operation.

Should you, at any time, feel that you would like to make some criticism or suggestion in connection with this branch of the service, Mr. Taurman would be glad if you would take the time to call or confer with him. His telephone is Main 214.

BIRMINGHAM ELECTRIC COMPANY
"BECO SERVICE"

A Series of Advertisements Introduced the Railway Officials and Their Work to the Public

slips pasted on the six upper sashes in the middle of the car, with lettering very much like that on the posters. In the accompanying view of a typical car the dash sign reads, "Use the Street Cars, Avoid Parking Troubles," and the upper window signs read, "Use the Street Cars—Safe, Economical, Dependable." The lettering on the inside of these window signs differs from that on the outside, as the latter is intended for the auto driver, whereas the inside is read only by the car rider. To him the message is, "The operator of this car is chosen for what we believe to be his efficiency," or "The more passengers who ride on this car the better service we can give," or some message of similar tenor. These window signs are changed once a month,

while the dash signs are changed once every week. Besides the newspaper advertising mentioned the company uses theater and other program advertising,



**Beco
Bill
Says:**

Being courteous toward one's inferiors is one of the marks of a gentleman.

Beco Bill Is the Traction Tom of Birmingham

has a large advertisement on the drop curtain in the principal theater in the city and has a motion picture slide in colors in all the motion picture houses in Birmingham. It also developed some time ago a split reel devoted to the difficulties of parking an auto in the business streets of the city. All those who took part in the preparation of this reel were members of the transportation department and it represented the difficulties which "Miss Birmingham" had in finding a place to park her car during a shopping trip. Its title was, "Miss Birmingham Goes Shopping." No mention



**More Truth
Than Poetry**

**USE THE STREET CARS
"Save the Difference"**

**BECO
BIRMINGHAM ELECTRIC COMPANY
SERVICE**

PASSENGER: "Your speedometer shows you have gone 25,000 miles. Been taking some long tours?"

DRIVER: "No, the 5,000 is the distance I have covered going back and forth to the office and the other 20,000 the distance I have covered looking for parking spaces."

The Daily Marathon!

"What's the idea, an endurance contest?"

"Nope, he grew those whiskers while looking for a place to park."



**USE THE STREET CARS
"Save the Difference"**

**BECO
BIRMINGHAM ELECTRIC COMPANY
SERVICE**



was made in the reel of the company, but the moral was just as evident. The reel was so good that it was shown in fifteen theaters in the city without any charge to the company.

INTRODUCING THE OFFICERS

One thought which came to the management was that the methods and policies of a large utility company may often be misunderstood by the public because the company seems impersonal to some extent. In a small town this would not be the case, but in a city the size of Birmingham, with its 300,000 inhabitants, all of the officers and heads of departments cannot know everybody. What is more natural, then, than that they should be introduced. In consequence, a series of advertisements was run introducing each officer and head of department by name and telling something about him. Each concluded with the statement that such officer or head of a de-

The plan was explained to the trainmen, who were asked to select some one of their number whom they considered representative of the transportation men—not necessarily an Adonis and not an aged Nestor—but some red-blooded young man who would supply the need. The men acquiesced and Beco Bill became a reality. Beco, it might be said, is a popular contraction in Birmingham for Birmingham Electric Company, and Bill was adopted for euphony.

Beco Bill, who is trainman 1259 and one of the regular employees of the company, figures to a considerable extent in the company's advertising, company publications and other literature. A favorite way of using his name is to introduce some injunction, advice or

One of the Four "White Cars" Used in the Preferred Stock Campaign. These Cars May Be Repainted Soon to Carry Some Other Message



Every Car in Birmingham Carries a Dash Sign and Window Sign to Encourage Traffic

aphorism with the words "Beco Bill Says." Thus, in the *Buzzer*, the company publication, for Feb. 22 Beco Bill says: "Being courteous toward one's inferiors is one of the marks of a gentleman."

Beco Bill has also served the company in other ways, as by taking charge of the information booth in the company's exhibit at

partment would be glad to have any criticisms or suggestions relating to his department. The company's service includes electric light and gas as well as railway, so that ten or twelve advertisements appeared in this series. Two of them are reproduced.

TRACTION TOM BECOMES BECO BILL

This method of advertising took care very well of the officers and heads of the department, but obviously was impracticable with the transportation employees, as they number more than 700. Nevertheless, they come in daily contact with the patrons of the road. It was therefore decided to have a personage to represent the large body of men on the property who are not officers or heads of departments. Such a person, it was felt, would seem more real than any mythical individual, but the management did not feel like making any choice which would seem invidious. It was therefore decided to leave the selection to the men themselves.

the recent Alabama State Fair.

Among the other means for developing traffic, the company pays a great deal of attention to keeping its cars well painted and clean and insists that its transportation men are neat in appearance when on duty. All cars are washed once a day by a spraying machine. The trainmen are encouraged to keep trim by having in each operating carhouse a free shoe-shining stand and a full length mirror in which they can inspect themselves from head to foot. On the top of this mirror are painted the words, "Do you think you represent Beco service?" The company does not claim it is the only one to use a mirror in this way. It does assert, however, that the mirror is appreciated by the men who take the same pride as a soldier in looking orderly and trim.

In the instruction of new platform men a great deal of emphasis is laid on the need for courtesy and salesmanship, and the same point is made in talking with the

older men. They are the "ride salesmen" of the company. The dispatchers also take care to see that the men when assigned to cars are neat in dress and appearance. Safe operation is encouraged by injunction and also by conspicuous markers at the main carhouse show-



A Full-Length Mirror in the Carhouse Helps the Trainmen to Keep Neat

ing the accidents by divisions. These markers are four large clocks, one for each division, indicating by a black hand the number of accidents on that division to date in the current year and by a red hand the number in the previous year. Every trainman who has gone six months without an accident for which he was responsible or without being reported for dereliction of duty receives a bronze medal. If his record in these matters continues for a year he receives a silver medal, and if for two years a gold medal. A number of men in the employ of the company wear gold medals of this kind.

Only one other means of promoting traffic used in Birmingham will be mentioned. This is the publication of a large map showing the lines of the company. Some ten or more of these maps were framed and set up at principal points in the city, each map being marked in red with the point where the map was displayed. The maps proved so popular that the company has been requested to supply a similar map to each of the 70 public schools of the city.

After all, it is the results which count. The company has had a gratifying increase in its patronage during the last year and attributes at least a part of it to its methods of traffic promotion. During 1925 the company carried about 68,000,000 transfer and revenue passengers. As 2 cents is charged for a transfer there is more reason for including transfer passengers in such a count than on those electric railway lines where transfers are free.

Standard Traffic Signs Used in Winnipeg

By H. G. STEWART

Superintendent Railway Distribution Winnipeg Electric Company

FOR the guidance of patrons and as a visible reminder to motormen to observe bulletined instructions, the Winnipeg Electric Company, Winnipeg, Canada, has adopted a system of signs which are attached to the trolley span wires at various locations. It was the aim in designing these to make them a distinctive shape and as conspicuous as possible without being unsightly. The material used is No. 16 gage sheet iron and in all cases the lettering is black on a white background with a finishing coat of clear varnish. The top of the sign is slotted in two places through which $\frac{1}{2}$ -in. x $\frac{1}{2}$ -in. galvanized strap iron hooks are crimped.

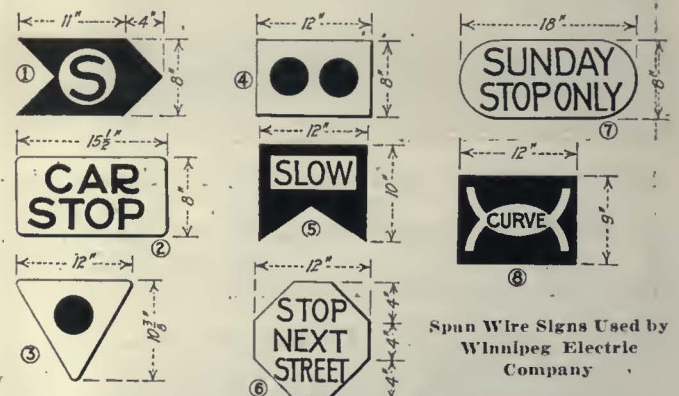
A "Safety Stop" is placed at railway crossings other than those which are protected by watchmen or automatic signals and at the foot of intersecting inclines. It warns motormen to come to a stop and then proceed cautiously. In many locations on the Winnipeg system poles are not available for the usual car stop indications as, for instance, where span wires are attached to eyebolts in buildings. At such points a "Car Stop" sign indicates to the public and train crews a loading and unloading station.

A "Car Stop—Next Street" sign is erected at locations which were formerly regular stopping places that have been discontinued. It is for the information of the public who, through habit, expect to board cars at these places. It is removed when it has served its purpose.

For the convenience of the public this company makes it a practice to have cars stop on Sundays opposite all church doors or at intersecting streets where churches are located and which are not ordinarily a regular stopping place. A "Sunday Car Stop" sign advertises this fact to the public.

A "Circuit Breaker" sign warns motormen to pass under trolley section insulators with power off. An "Electric Switch" sign is a reminder to observe the rules governing the operation of electric track switches.

At the approach to extensive special trackwork, such as leads into carhouse or at the approach to temporary



- 1. Safety stop.
- 2. Ordinary car stop.
- 3. Section Insulator.
- 4. Electric switch.
- 5. Special work sign.
- 6. Discontinued stop.
- 7. Church stop.
- 8. Non-clearance curve warning.

track laid during reconstruction, a "Drive Slowly" sign appears. It notifies that cars are to be operated across this special work cautiously and slowly.

On this system practically all intersections and curves were designed for car clearance. In a few instances where clearance could not be obtained "Non-clearance" signs warn motormen that cars cannot pass each other.

Buses Supplement Rail Transportation System in Boston

Rapid Development of Auxiliary Bus Service by the Boston Elevated Railway Has Occurred During the Past Two Years—
In Part This Service Replaces that Formerly Given by Street Cars, but Considerable New Route Mileage Has Been Added

By Edward Dana

General Manager Boston Elevated Railway



From This Point the Boylston Street Bus Continues on the Surface Through the Downtown District While the Cars Go Underground

CO-ORDINATION of four distinct types of transportation has been accomplished during the past few years by the Boston Elevated Railway. On Feb. 24, 1922, the first bus line was established to supplement the existing street railway, elevated and subway services. Since then this auxiliary service has been developed until 190 buses on 25 lines are now carrying passengers at a rate of 27,000,000 a year. Bus traffic represents approximately 7½ per cent of the total carried by the system.

Bus routes fall into three general classifications. Of the total of 25 routes, five render transportation service in new territory not previously served. Seven have in part replaced former car service, but have also been extended into new territory which the cars did not reach. Twelve have been straight substitution of buses for cars, one is operated only at night in place of owl

car service. In general, the fare on buses is 6 cents for a local ride and 10 cents when transfer to other parts of the system is desired. This is the same as the fare on the cars, the 6-cent fare entitling a passenger to a local ride without transfer privilege and the 10-cent fare entitling a passenger to go from practically any point on the system to any other point on the system using buses, street cars and underground or elevated rapid transit lines.

Round-trip route mileage, running time, number of trips daily, type of service and rates of fare for the various bus lines are given in an accompanying table. The total miles of streets covered by bus routes is 49,177. Each day 3,130 trips are operated, making a total of 12,659 bus-miles. At present, the daily mileage operated is about one-fifth of that operated during the entire year of 1922, when bus service was in-

SUMMARY OF BUS OPERATION BY BOSTON ELEVATED RAILWAY

Route	Round Trip, Mileage	Round Trip Running Time	Trips Daily	Total Miles Daily	Type of Service	Local Cents	Fare, Cents, Including Transfer
Wolcott Square—Cleary Square	2.74	16	22½	61.65	Replaced car service	..	10
Wolcott Square—Mattapan Square	6.40	36	82½	528.00	Replaced car service	..	10
Cleary Square—Mattapan Square	3.66	20	6½	23.79	Replaced car service	..	10
Rowea Wharf—Summer and Arch	1.16	10	139	161.80	Replaced car service	5	None
Haymarket Square—Battery and Commercial	1.25	11	77	96.25	Replaced car service	5	10
Belgrade and Center—Center and Elliot	5.23	30	101	527.83	New territory	6	10
Church Street—Center and Elliot	4.67	28	8	37.36	New territory	6	10
Copley Square—South Station	2.90	15	67	194.10	New territory	6	10
Park Street—Granite Bridge	3.52	17	217	763.84	Replacement and extension	6	10
Park Street—Pierce Avenue	2.22	12	47	96.35	Replacement and extension	6	10
Center and Spring—Grove and Washington	2.56	12	54	136.89	Replaced car service	6	10
Andrew Square—Old Colony Avenue	1.33	6	38	50.69	Replaced car service	6	10
North Station—South Station	2.20	18	109½	241.23	Replaced car service	6	10
Union Square (Allston)—Brooks and Faneuil	3.75	18	119	446.13	Replacement and extension	6	10
Green Street—Ashby and Commonwealth	2.63	16	189	496.69	Replaced car service	6	10
Green Street—Granite and Brookline	1.96	10	60	117.54	Replaced car service	6	10
Harvard Square—Kendall Square	4.40	22	130	572.26	Replaced car service	6	10
River and Blackstone—Central Square (Cambridge)	1.39	6	13	180.83	Replaced car service	6	10
Huntington and Longwood—Brookline and Longwood	0.91	6	13	180.83	Replaced car service	6	10
Fenway—North Station	6.05	34	239	1,445.95	Replacement and extension	No fares collected	10
Harvard Square—Scollay Square (night bus)	6.87	30	25	171.80	Replaced owl car service	..	10
Union Square, Allston—Union Square, Somerville	6.82	30	132	899.71	New territory	6	10
Main and Massachusetts—Bowdoin Square	4.09	21	195	797.55	Replaced car service	6	10
Medford Square—Fellaway	2.98	16	98	292.24	New territory	6	10
Magoun Square—Sullivan Square	4.21	24	188	791.67	Replaced car service	6	10
Central Street, Somerville—Sullivan Square	3.69	16	40	147.64	Replaced car service	6	10
Faulkner—Cross and Main	2.84	12	137	389.35	New territory	6	10
Medford Square—North Cambridge	5.82	34	136	791.93	Replacement and extension	6	10
Upper Highland Avenue—Broadway North via Maldea Square	7.90	36	82	647.47	Replacement and extension	6	10
Fellaway and Medford Street—Linden	7.79	40	158	1,231.29	Replacement and extension	6	10
North Street—Arlington Centre	3.35	20	92	308.29	Replacement and extension	6	10
			3,130	12,659.94			

Total number of main bus routes 25
 Total miles of streets covered by bus routes 49,177

augurated. The extent of operation in each year is shown in the following table:

BUS MILEAGE OPERATED, BY YEARS

Year	Miles
1922	63,927
1923	465,382
1924	890,901
1925	2,472,456

In the outskirts of the city most of the bus routes are replacements of former car lines, although in many instances extensions have also been made. Among the routes in this class are those in Hyde Park, Dorchester, West Roxbury, Brighton, Cambridge, Malden and Medford. A route from West Roxbury to Jamaica Plain serves new territory, as does one from Union Square, Allston, to Union Square, Somerville.

Bus routes are shown on an accompanying map as well as the surface car, elevated and subway lines. Special interest, perhaps, attaches to the bus routes that

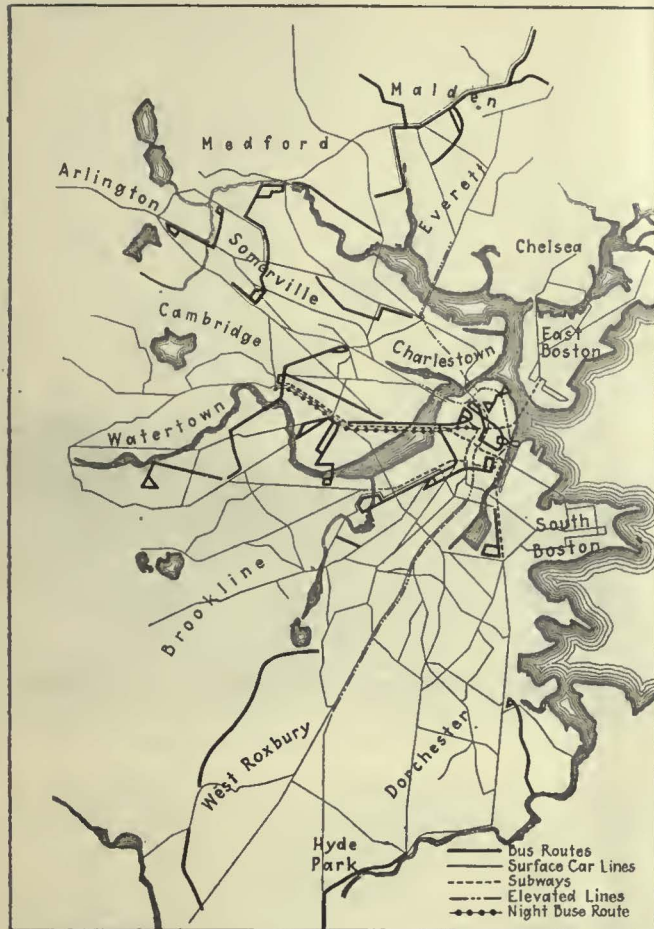
are operated in the congested downtown business district of the city.

Surface car lines in the congested district have to a large extent been superseded by underground rapid transit lines. North and south rapid transit is now provided by the Washington Street subway, while east and west rapid transit is taken care of by the East Boston Tunnel and the Cambridge Subway. Surface cars are operated over the East Cambridge Viaduct and in subways between North Station and Kenmore Station at the intersection of Commonwealth and Beacon Street and also under Tremont Street as far as Broadway.

For the accommodation of short riders who do not care to go into the subways for a short trip, the company has found it desirable to inaugurate a bus service to a limited extent in the downtown section of the city. In this classification are the Rowes Wharf, the Haymarket-Battery, the Copley Square-South Station, the



A Transfer Point Between Cars and Buses in the Suburbs—Field's Corner, Dorchester



Four Kinds of Transportation Service Are Given by the Boston Elevated Railway Over a Network of Routes Covering the Entire Metropolitan Area

South Station-North Station and the Fenway-North Station routes.

On the route from the Fenway to the North Station, which follows Boylston Street above the subway, crosses along Charles Street between the Common and the Public Gardens and thence to Bowdoin Square and the North Station, an experimental double-deck bus will soon be tried. One such vehicle has been purchased from the Six Wheel Company of Philadelphia. This is the same general type of vehicle as that which is being operated in Cleveland, as told in *ELECTRIC RAILWAY JOURNAL*, March 24. It is believed that on a route of this kind, passing through the high-class shopping district of the city, double-deck service is likely to prove popular.

Bus equipment operated by the railway is shown in the following table:

BUS EQUIPMENT OF BOSTON ELEVATED RAILWAY			
Number	Chassis	Body	Seats
55	White	Brown	25
1	White	Kuhlman	25
25	White	Brown	29
42	Mack	Mack	29
32	Mack	International	25
3	Mack	Boston	25
11	Yellow	Yellow	29
2	Pageol (one de luxe)	Pageol	29
1	Six Wheel double deck	American	61
18	International	Niagara	25
190			

The buses are operated from three stations, Arborway, Bennett Street and Salem Street. Garages have been provided at Arborway, Allston and Salem Street. An additional garage is now contemplated in the vicinity of Union Square, Somerville.

Standardized Overhead for the Canadian National Railways

Recently Electrified Grantham Division of the Niagara, St. Catharines & Toronto Railway Employs System Suitable for Various Voltages and Operation with Either Pantograph or Trolley Collectors

By W. H. C. VILLIERS
Niagara, St. Catharines & Toronto Railway

DEVELOPMENT of a standard type of overhead construction which is susceptible of adaptation to other lines is an interesting feature of the recently electrified Grantham Division of the Niagara, St. Catharines & Toronto Railway, operation over which was begun some time ago. This line is part of the Canadian National Railways. The Grantham Division extends from Port Dalhousie, the terminus of the Welland Canal on Lake Ontario, to Merritton, the junction with the main line of the Canadian National, and is approximately 6 miles long. Comprised in the system of the Canadian National Railways are a number of electrified divisions, operating at d.c. voltages varying from 600 to 2,400, and also at 3,300 volts a.c. For this reason the standardization of types of construction, so far as possible, is of importance from economic and engineering standpoints.

In the preliminary study of the problems presented by its electrification the engineers in charge of the work, E. B. Walker, electrical engineer Canadian National Electric Railways, and R. L. Harrison, chief engineer Niagara, St. Catharines & Toronto Railway, exhaustively reviewed existing systems, with the object of developing an overhead construction which would combine their advantages to the greatest degree and at the same time be suitable for any of the voltages mentioned and meet the exigencies of trolley wheel or pantograph operation. The design of overhead construction finally evolved is the result of an analysis of the advantages



Armless Tower on 3-Deg. Curve

and disadvantages of the three principal types of construction, viz: (a) Wood poles with normal spacing; (b) light steel poles of various types with normal spacing; (c) heavy steel poles and steel bridge structures with long spacing. The design not only utilizes the good features of these systems, by combining the permanence of steel construction with the capital economy of wood poles, but it does so at an increase in cost over the latter of not more than 10 per cent.



Overhead Structure at Welland Canal Swing Bridge



Standard Tangent and Armless Towers on Curve

The standard tower evolved is built up of hot-galvanized standard angles forming a square column. Its height is approximately 25 ft. Various standard "heads" to suit the physical conditions of the track may be attached to the tower. A standard tower for tangent, towers with high-tension and telephone extension and armless towers used on curves are shown in accompanying illustrations. Provision is made for carrying high-tension and telephone-dispatching circuits.

Liberal loading allowances were made in calculating the towers and actual tests have shown a safety ratio of two to one. The towers were fabricated by the Canadian Bridge Company of Walkerville, Canada, and all are set in concrete, the work of erection being done by the Niagara, St. Catharines & Toronto Railway, under the direction of J. W. Walker, electrical supervisor.

To compensate for the increased cost of steel structures, it was considered possible, by carefully limiting the weight of the overhead system, to adopt a normal span of 330 ft. on tangents, with a maximum sag at normal temperatures of 6 ft. and a corresponding messenger tension of 3,600 lb. The operating voltage on the new division, uniformly with the remainder of the Niagara, St. Catharines & Toronto system, is 600 volts direct-current, and the trolley, which is standard No. 0000 grooved-section, hard-drawn copper, is suspended

by means of special hangers from a specially made messenger consisting of a seven-strand steel core surrounded by two layers or 30 strands of aluminum, each strand being of 0.1261-in. diameter. This messenger wire, which weighs only 3,944 lb. per mile, provides a conductivity equivalent to 300,000 circ.mil of copper and has an elastic limit of 16,600 lb. per square inch and an ultimate strength of 22,000 lb. per square inch. While the span adopted is greater than usual, the low weight of the overhead system reduces the actual loadings to less than exists in many systems with less than 300 ft. spacing, and yet provides, with calculated maximum ice and wind loadings, a high factor of safety.

Considerable ingenuity was displayed by the engineers in adapting the existing swing bridge over the

Welland Canal to electric operation. Special steel structures, built up from standard tower sections, were designed for this purpose; also special steel anchorages, of similar character, for the messenger, at each end of the bridge. Ohio Brass Company insulators and fittings are used.

Construction adopted on this division has proved so satisfactory, from considerations of cost, strength and appearance, that it has recently been installed on a 2-mile section of the Toronto suburban district of the Canadian National Electric Railways and also on a 10-mile extension of the electrification of the Montreal Tunnel, operated at 2,400 volts with multiple-unit cars.



Armless Tower with Vertical Extension

Citizen vs. Street Railway

The Public Is Not a Mass but an Individual Raised to the *N*th Power, and Public Opinion Is Therefore Only a Greatly Enlarged Private Opinion—It Is Not Enough to Do Our Best, but the Public Must Be Told Our Story

By Ed Wolff

Hughes, Wolff & Company, Inc.

THIS case is now being argued in the Supreme court of public opinion. The attorney for the people is the motor car. In a desperately short time there promises to be handed down a verdict. It will be final. The street railway will be reinstated and rehabilitated or it will languish slowly into oblivion. What is the case for the prosecution?

It will be well first to draw a picture of the complainant. He is not "the public." There is no such thing as a composite public, which can be considered as an individual. For a quarter of a century my experience as an advertising man has brought me into

In Milwaukee, last February, Pete Harris's mother was on a Downer Avenue car. I happened to be there myself. She is not an attractive woman any more. Her age is all of 65. Her face is lined and wrinkled, the skin is sallow, the eyes dull. Her clothes are old and faded. Stupid, unseeing and slow, she is, frankly, enough to irritate the average man who might transact business with her. So when the car had started again and she said to the conductor, from half way down the aisle, "I wanted to get off here," he could not be expected to stop the car midway of the block. And when he retorted, "Well, lady, why didn't you ring the bell?"

STREETCAR-TOONS

SOME PEOPLE WON'T MOVE UP UNTIL YOU WALK OVER THEM, THEY'RE TOO MEAN, OR TOO DUMB!

IT'S ALWAYS LIKE THAT IN LIFE. THOSE THAT WON'T MOVE UP STAND STILL UNTIL THEY'RE WALKED ON.

UNTIE YOUR FEET - THAT WILL TAKE THE KINKS OUT OF YOUR HEAD!



© Barron G. Collier, Inc., 1926.

Rube Goldberg's Idea of Street Car Etiquette as Displayed in a Collier Car Card

contact with scores of public service corporations and big manufacturers and has taught me this one important fact—that the companies which succeed best in winning and holding friends among possible customers are those which have discovered that "the public" is not an entity, a homogeneous mass, but is a great group of individual men and women. The public is one man, or one woman, multiplied to the *n*th power. As soon as the heads of a mighty business learn that the consumer is just one person, duplicated over and over, things take a turn for the better. Our complainant, then, is Pete Harris, of Any Street, Everywhere. As parties to the suit he has behind him several millions of other men and women, but, essentially, our antagonist is Pete Harris. Win him over and we have won over all of his kind and breed. Let us see what has happened to Pete Harris recently on the street car.

"I'm a conductor, not a mind reader," one may hardly blame him too harshly.

But when that old lady tells her son Pete about it that night and pictures how her dignity and pride were humbled by the conductor in front of 20 or 30 people, Pete becomes hotly indignant. With all her shortcomings, that woman is Pete's mother. She was in no position to engage in a verbal battle with the conductor before a strange audience. Maybe her breeding as a lady would not have permitted it. Be that as it may, the assailant of Pete's mother wore the uniform of the traction company, and so far as Pete is concerned it is the company which has insulted his aged parent. Does Pete explain to her that the company tells its men to be courteous, that it has no intention of allowing its employees to offend its patrons? Pete does not. Pete doesn't even know whether this is true.

What he does know is that a duly authorized agent of the corporation has made his mother cry in bitter grief. And Pete is mad about it.

Meanwhile some dozen or so other men, who also have mothers, or wives, or sweethearts, make mental note of the occurrence which developed before their eyes. In imagination they see their dear ones undergoing the same indignity. Immediately, without an effort on his part, Pete has these men ranked solidly behind him in his suit—Citizen vs. Street Railway. They are witnesses for the prosecution as well as co-prosecutors.

Later I met another member of Pete's family on a Market Street car in Chattanooga. It was his wife. She is a buxom, fairly good-looking woman; not overly-refined or educated, but a typical American woman of the middle class. When she paid her fare I heard her ask the conductor to put her off where she could catch a Signal Mountain car. By the time we neared Lookout Mountain, and were a mile or two from her connecting point, she reminded him of it. He said: "Lady, you passed it long ago."

"But I told you to put me off there."

"I called it out. Why didn't you listen?"

"Why didn't you call me? I sat right near you purposely. I'm a stranger here. Give me a transfer back."

"I can't do that."

"Well, I'll stay in the car and you can carry me back."

"All right. But you'll have to pay your fare again."

"I guess not. Why should I?"

"Lady, this car has to go ahead. Are you going to stay on or get off?"

Pete's wife got off. Some silly school girls across the aisle had the poor sense to giggle about it. She heard. Her face flushed. No doubt she told Pete about it when she got back home. Did Pete tell her that it was her fault? Did he explain that conductors are bound by rules that they cannot overstep? He did not. Remember, this is Pete's wife. He loves her above all women of the earth, except perhaps his mother in Milwaukee. What does he do? Being human, he chalks down another score against the traction company.

And again some dozen or so men line themselves up with Pete. The number of parties to the prosecution grows.

Pete ruminates over these things and they burn inside of him. Then he gets off from work that night tired and hungry. It is raining—a leisurely, sloppy rain. His clothes are wet, his shoes are wet, his temper is wet. He waits, and he waits. The longer he waits the madder he grows. The knot of people who are waiting with him grows and grows. Somebody makes a clever remark about the service. Some laugh. Some, like Pete, grit their teeth and swear under their breath. Finally the car looms into sight.

It is packed tight. Human ingenuity could not get another person into that car, even if human endurance could tolerate the pressure. The motorman, already behind schedule and knowing the condition of the interior, has no time to stop and explain; still less to lose more precious seconds by stopping at all. He sails majestically by the waiting group. Three voices are lifted in imprecation—one sarcastically, one profanely. One says: "We ought to have buses on this line." The suggestion goes unanswered, but everybody thinks.

Another car is right behind. "Fine service," growls a man. A confused murmur of agreement comes from the group. They push into the car, already uncomfort-

ably full due to the unexpected rain. The conductor yells, as I heard him yell in Rochester last week: "Step back there! Plenty of room in the back. What do you want to act like cattle for and crowd up in the front? Step back, I tell you. Step back!"

Pete steps back, but his fists are clenched and his lips are white. There is no more room in back than there was in front. But moving back did leave a little more space in front to jam a few more people into at the next stop. Pete notes this, but says nothing.

Leaving Pete for a moment to fume and stew by himself, let me remark that I have been publicity counsel and advertising agent for more than one public service corporation, including street railways. Neither for myself nor for readers of ELECTRIC RAILWAY JOURNAL do I need to repeat the points in the case for the defendant. I know, as you know, the instructions given to the car crew. I know what happens to schedules and the thousand and one things that "the public" is and does. But what you know and I know does not count. What we're standing trial for today is what Pete Harris knows, or thinks he knows.

Pete Harris is complainant and tells his story as he sees it. And behind Pete Harris stand several hundred thousand, or million, other Pete Harrises, ready to testify in his behalf before the jury. And the jury is composed of twelve Pete Harrises? Or twelve million. Where's our case?

Witnesses for the defendant having testified, the most able and representative is cross-questioned:

Q. What do you think is needed to revive traction patronage?

A. Better-looking cars—more architectural and artistic.

Q. Millions of people are riding in rusty and dirty motor cars, aren't they? Cars without art or beauty?

A. Yes.

Q. Those people, lots of them, live in decidedly inartistic homes, don't they?

A. Yes.

Q. Argument invalid. Any other thing?

A. Yes. Street railway cars should make less noise.

Q. Well, why don't they?

A. The car builders don't make them.

Q. If you refused to buy noisy cars, as the public refuses to ride in them, the car builders would make them, wouldn't they?

A. Have to, I suppose.

Q. Do you employ engineers?

A. Do we—say, what do you think we're running? A fruit stand? Of course we em—

Q. Don't they know that noise means friction, and wear, and expense?

A. Yes.

Q. Well, then, why don't they show you what noisy cars mean to you in loss and expense, even regardless of the public?

A. I refuse to answer such a silly question.

Q. Never mind. The public and the motor car makers are answering it for you. What steps does your company take to make friends with the public.

A. Make friends with the public? Why, I never heard of such a thing. Doesn't the public need us?

Q. That's a question nowadays. Tell me, do you advertise?

A. Advertise! For what? Haven't we got the business now?

Q. You used to have. Have you got the public's good will?

A. Well, no.

Q. Isn't that what's wrong with your business?

A. Perhaps.

Q. If the public understood all your problems wouldn't it be more reasonable?

A. No.

Q. Why not?

A. Well, people are ignorant.

Q. Of course. But if you explained your side of the case through the columns of the daily press, as other business men do, wouldn't the public come out of its ignorance? Wouldn't it know what it doesn't know now? And who is going to teach it those facts if your company doesn't? You're excused.

The fact is that the experiment has been tried. Some eleven years ago in San Antonio, Tex., I arranged with Vice-President Tuttle and his co-worker, E. E. Eysenstein, to put on a newspaper campaign for the traction company. We took the public into our confidence. We told how much it was costing to lay new tracks; the percentage of fares received that went into new equipment, operating expenses, damage suits, and so on. We were frank, open and honest. We appealed, in a dignified way, for public support on the basis of honest intent to render worthy public service. It would require too much space to detail the various benefits that were

apparent in even so short a time as one year, but the most noteworthy was a reduction of about one-third, as I recall it now, in the amounts of the damage suits filed against the company.

Now, what are we going to do with Pete Harris? Are we going to let him curse and rave and swear at us in the future as he has done in the past, until the motor car makers calmly take over our business with Pete's consent, or are we going to find out just what ails Pete, try our level best to give him what he reasonably wants and is entitled to?

Are we going to let Pete sit in sullen silence, while we sit in sullen silence, blaming each other in ignorance of our reciprocal need? Are we going to make an active effort to save Pete as a friend and patron or are we going to continue to tell him to "go to ——," Detroit, where motor cars are made?

Traffic Increased by Use of New Cars

Modernization of Rolling Stock of the Morris County Traction Company Has Attracted Additional Riding and Reduced Operating Expenses — Taxes and Paving Charges Amounting to 18 per Cent of Gross Receipts Endanger Continuance of Railway Service



Through Service Between Morristown and Newark Has Been Established by the Morris County Traction Company
A Morris County car is here seen emerging at the western end of the Public Service Railway subway.
Public Service terminal is seen in the background

IMPROVEMENT in the local transportation service in Morris County, New Jersey, has resulted during the past several years from the modernization of the rolling stock of the Morris County Traction Company. This has brought about a gratifying increase in the number of passengers carried by the railway and a reduction in operating expense to 25.23 cents per car-mile. An unfortunate combination of taxes and paving obligations, however, places such a heavy burden on the company that its operation is unprofitable.

In April, 1920, fifteen single-truck Birney safety cars were first placed in regular operation. Prior to that time, the railway had a number of old wooden cars which have now been largely retired from service, and also some comparatively modern double-truck two-man cars with steel bodies. Disadvantages of the latter type of car were their weight and the need of a two-man crew. Modifications in the design were made at a later date, so that by April 15, 1923, it was possible to inaugurate

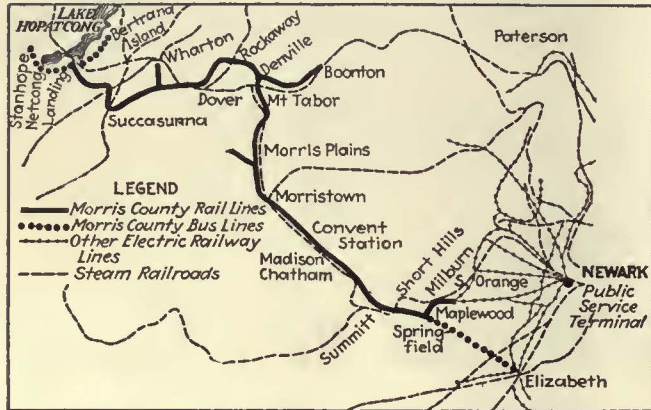
complete one-man operation of all cars. In September, 1924, ten light-weight double-truck safety cars were bought from the Osgood-Bradley Car Company and placed in service.

Among the savings resulting from the operation of more modern equipment has been a substantial reduction in energy consumption. Comparative figures for various types of cars are given in the table below. The average speed is 11.42 m.p.h.

ENERGY CONSUMPTION PER CAR-MILE	
Six old-type double-truck cars.....	3.0 kw.-hr.
Thirteen double-truck steel cars.....	2.6 kw.-hr.
Fifteen single-truck Birney cars.....	0.9 kw.-hr.
Ten light-weight double-truck cars.....	1.7 kw.-hr.

Other expenses of operation have been similarly reduced, so that the present cost per car-mile is 25.23 cents as against 28.77 cents in 1922. Distribution of these costs among the various operating accounts is given in the table on page 764.

The total number of passengers carried increased in 1924 over the preceding year and again in 1925 over 1924, the total for last year being 7,891,942, which is the largest in the history of the company. An interesting and gratifying change has occurred in the riding habit, so that the traffic is now considerably more uniform throughout the year than was formerly the case. This is shown graphically in an accompanying



Car Lines of the Morris County Traction Company Connect All the Principal Towns in Morris County and Connect with Public Service Railway Lines in Elizabeth and Newark

chart, giving a comparison of passengers carried by months from 1922 to 1925 inclusive.

Several factors are believed by the management to have contributed to the increase in traffic. The comfortable riding qualities and attractive appearance of the new cars undoubtedly have had an important effect. Through operation between Morristown and the Public Service Railway Terminal, Newark, a second factor of importance in building up traffic commenced on Dec. 6, 1925, as told in ELECTRIC RAILWAY JOURNAL for Dec. 12. This eliminated the necessity of changing cars at Maplewood, where the tracks of the two companies join. Growth of the residential communities in Morris County is another element which has aided traffic.

Through operation between Morristown and Newark involved several problems of fare collection. Morris County cars are operated by their own trainmen over the tracks of the Public Service Railway. It was stipulated in the agreement, however, that this service should be available to local passengers between Maplewood and Newark on the same basis as that given by Public Service cars. Fare collection on the Morris County cars is on the pay-leave plan in both directions. Each passenger, except those boarding in the initial zone, receives an identification check. These are different for the different zones and enable the operator to determine how much fare should be paid when the passenger leaves the car. The area of operation over Public Service tracks is treated as two additional zones of the Morris County line, but the fare charged is that of the first-named company.

Morris County fares are 7 cents per zone, having been increased in May, 1918, from the previous rate of 6 cents. That rate, in turn, had been increased in November, 1917, from the original 5-cent fare. The average length of fare zone on the main line is 3.94 miles, while the average length for the entire system, including branches, is 3.72 miles.

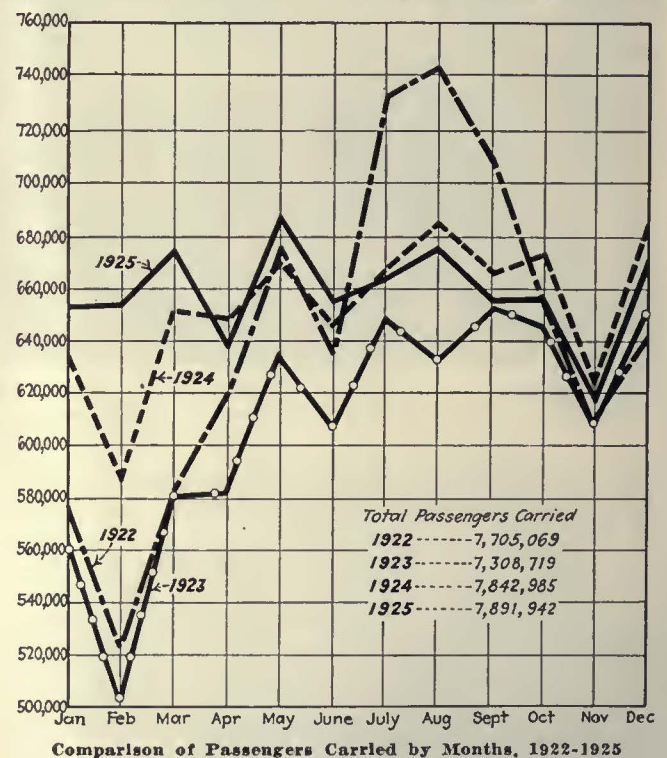
Bus operation has been undertaken by the railway on three lines. Beginning in May, 1925, service was commenced on a line 3 miles in length from the railway terminal at Landing to Netcong and Stanhope, and on

COSTS OF OPERATION, MORRIS COUNTY TRACTION COMPANY, 1922-1925

	Cents per Car-Mile			
	1922	1923	1924	1925
Maintenance of way and structures.....	5.46	5.00	4.54	4.50
Maintenance of equipment	2.80	2.28	2.80	2.80
Power	6.47	6.01	5.10	5.19
Conducting transportation	8.87	8.94	8.38	8.01
Traffic	0.02	0.10	0.08	0.05
General and miscellaneous.....	5.15	4.81	4.77	4.68
	28.77	27.65	25.76	25.23

a second line 1 mile in length from the same terminal to Bertrand Island. The fare from Landing to Stanhope is 20 cents and the fare from Landing to Bertrand Island is 10 cents. Prior to 1916 the Morris County Traction Company operated from May 30 to Sept. 4 each year from Landing to Bertrand Island over the tracks of the Lackawanna Railroad for a distance of 3,800 ft. This operation was discontinued during the war, due to heavy freight traffic serving a munitions plant on this line of the steam railroad, and was not resumed thereafter. The bus route to Netcong and Stanhope is new. Substitution of buses in place of cars on the branch from Springfield to Elizabeth was made recently to avoid expensive track repairs.

Despite the favorable results which have accrued to the railway from the modernization of equipment, the present financial situation is serious due to extremely heavy tax and paving burdens. In 1925 the franchise and gross receipts taxes paid by the company amounted to 8.728 per cent of its total gross revenue. In addition, taxes locally assessed on rights-of-way, real estate and buildings made the total in excess of 9 per cent of the gross receipts. Paving obligations have amounted to approximately 9 per cent of the gross, making the total



obligations of this character more than 18 per cent of the revenue.

Of the total mileage of the company, 15.43 is on private right-of-way, 10.65 alongside of paved streets and 22.56 in paved streets. Snow removal on the paved streets is done by the railway. Counties, towns and the state are supposed to remove the snow from the sides of the streets, but in actual practice

it is often found that only the space cleared by the railway is available for traffic. Concentration of all traffic on the pavement in this small area wears it out rapidly.

Acting on the complaint of numerous automobile drivers, the State Highway Commission recently applied to the Attorney-General of New Jersey for forfeiture of charter of the Morris County Traction Company on account of failure to perform its paving obligations. An unusual legal situation is thus presented because the company is at present in the hands of receivers, appointed by a United States court.

PAVING OBLIGATIONS PROVE HEAVY BURDEN

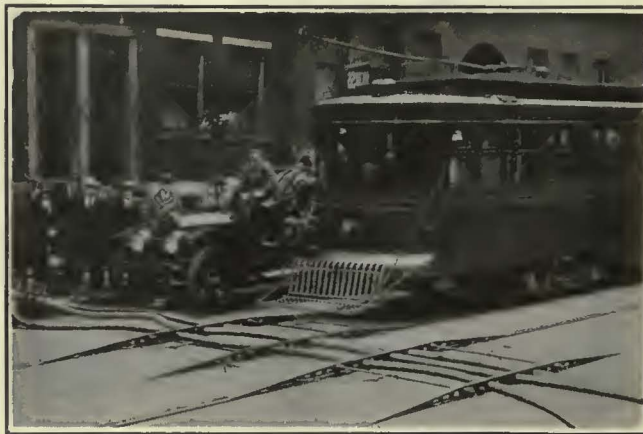
The receivership dates from July 23, 1923, and was the outcome of refusal of a minority interest to agree to a refinancing plan. In 1918, the earnings being insufficient to meet the full interest charges on the bonds, the bondholders agreed for a period of five years to exchange the 5 per cent coupons on their bonds for new coupons at 2 per cent and an income trust certificate to cover the difference. Under the trust agreement the 3 per cent coupons attached to the income trust certificates were automatically canceled each year if the earnings were insufficient to permit payment. During the following five years the 2 per cent coupons were regularly met and the income trust certificate coupons were canceled. Before the expiration of this agreement in 1923 a refinancing plan was submitted to the bondholders. According to this plan they were to accept new bonds at 6 per cent for half of their holdings and non-cumulative preferred stock for the other half. Execution of this plan required the consent of all the bondholders. Unfortunately, three individuals out of a total of 286, representing only 3.13 per cent of the bonds, refused to deposit their holdings for exchange and the refinancing plan could not be undertaken.

When the original paving agreements were made, macadam paving was in general use throughout the territory in which this company operates, and it was stipulated that the paving work done by this railway should be of this type. In recent years, however, heavier pavements have come into use and an attempt has been made to have the railway install these more expensive kinds. To this the company has objected. As a solution of this difficult problem a bill was introduced in the New Jersey Legislature to relieve street railways in part of their paving obligations. Although passed by the Senate and General Assembly, this bill was vetoed by the Governor and the question reverts to its original status.

Substitution of buses for cars has been considered as a possible remedy for the situation. While this might be advantageous on certain branch lines, it is not thought by the management to be a sound economic arrangement for the main line. Operating expenses, on account of the modernization of equipment, are well within the revenue, and the financial difficulties are entirely the result of the heavy taxation and paving obligations. While it might be possible to eliminate some of the latter by substituting buses for cars, this would simply shift the paving burden to the municipality. It is believed to be a better plan to make such a shift by legal means and to continue the operation of cars, which, it is stated by the management, can provide the necessary transportation service more economically than it would be possible to do it with buses.

Hose Bridges Adopted in Pittsburgh

TESTS were recently conducted by the Pittsburgh Railways in collaboration with Chief Richard Smith of the city fire department and Ben Marshall, city traffic engineer, to determine the desirability of using hose bridges to prevent tie-ups of street car traffic by fires. An accompanying illustration shows the



Simulating Actual Emergency Conditions During Tests of Hose Bridges in Pittsburgh

carrying out of these tests under circumstances as nearly as possible approaching actual emergency conditions. The results were so satisfactory that hose bridges have been made part of the regular equipment of emergency trucks of the railway. The type used in Pittsburgh were supplied by the Ohio Brass Company.

Bus Discussion in the "National Municipal Review"

RELATIONS between the bus and other forms of transportation was the subject of an article by Walter Jackson, consultant, Mount Vernon, N. Y., appearing in the *National Municipal Review* for April. Economic aspects of bus service as a substitute for electric railway service were discussed. The value of co-ordination was brought out, but it was stated that mere "alternation" of cars and buses should not be confused with "co-ordination." Possibilities of de luxe service and the present interstate bus situation also were touched upon.

Co-operation Between Hotel System and Electric Railway

AN EXAMPLE of co-operation between hotel management and electric railway services is noted in the time-table schedule of electric railway services in and out of Fort Wayne as shown in the booklet of the Keenan Hotel System. An interesting sixteen-page pamphlet has been issued as an invitation to salesmen to talk over their problems at the Anthony Hotel or the Keenan Hotel in Fort Wayne, and if they must travel it directs them to new territories. For this purpose two traction time cards are provided which cover all traction lines in and out of Fort Wayne. Steam schedules can be obtained in the lobby of the hotel. These schedules, together with the map in the center of the booklet, should furnish the traveler a fund of information from which to work out the most advantageous schedule for his particular destinations.

Maintenance Notes

Convenient Commutator Slotter

IN THE Atlanta shops of the Georgia Railway & Power Company is a home-made commutator slotter which has proved very convenient and useful. It is shown in the accompanying illustration. Power for the slotting saw is provided by a $\frac{1}{2}$ -hp., 110-volt, single-phase motor, which has an armature speed of 1,120 r.p.m. The saw is carried on an extended arbor.

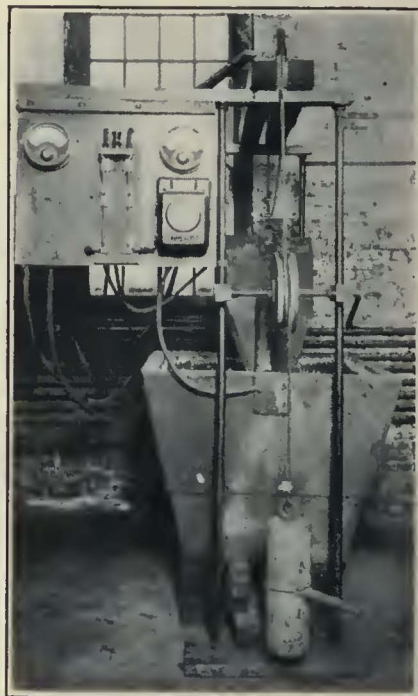
The motor is raised or lowered by means of the vertical screw shown attached to the left upright of the frame. The sliding carriage for raising and lowering the motor is provided with adjusting screws to take up lateral wear, both guides being renewable. The horizontal feed of the motor is obtained through moving the carriage the length of its cut by means of the lever shown at the left. The motor is also mounted

on a pivot, making it possible to slot commutators which are slightly skewed.

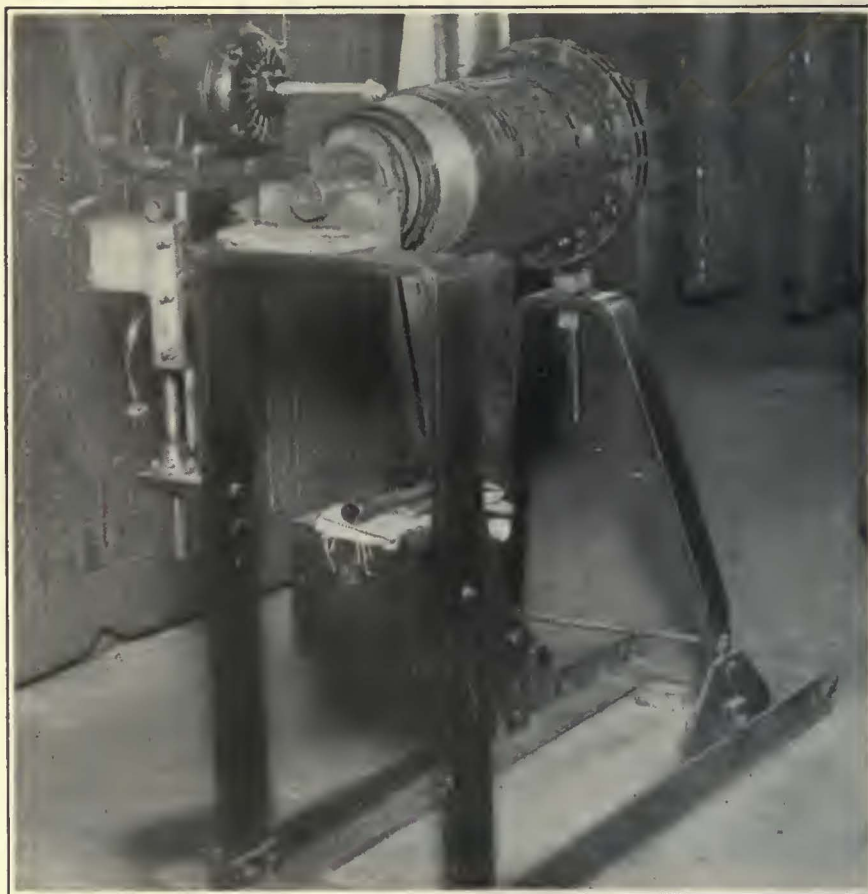
The block supporting the commutator end of the armature shaft is always at the same height, but the upright which holds the pinion end of the armature shaft is adjustable to care for various heights and lengths of armature.

Water Rheostat Test for Gas-Electric Buses

FINER load adjustment is possible with the water rheostat test now being used by the Philadelphia Rural Transit Company to determine the power plant efficiency of gas-electric buses than may be attained with the grid type of rheostat commonly used in dynamometer testing equipment. Each garage and the mechanical and electrical laboratories of the company are now being



A Cast-Iron Receptacle with Salt or Soda Solution Is Used for Rheostat



This Commutator Slotter Is Rapid and Adjustable to All Sizes of Armatures

equipped with these rheostats, which consist of the following units:

A cast-iron receptacle holding about 55 gal. of salt or soda solution, a balanced electrode weighing about 25 to 30 lb., necessary pulleys and rope for same, a wood instrument board having mounted thereon a 600-watt G.E. ammeter, one 600-volt G.E. voltmeter, one watt-hour meter, one 250-amp., double-pole knife switch, necessary terminals, meter wiring and 75 ft. of No. 00 heavy insulated lead wires.

Referring to the accompanying wiring diagram, the procedure of testing is as follows: The terminals marked *A* are connected to a junction block provided for this purpose on the left-hand side of the chassis, the engine is then started and a load of 200 to 400 amp. is transmitted to the generator through the manual operation of the electrode *B* coming in contact with the salt or soda solution in the cast-iron receptacle *C*. The area of contact between the electrode and the liquid entirely controls the resistance applied to the generator.

On each test the engine r.p.m. is at its maximum and during such time the radiator water tempera-

tures are recorded. The thermal efficiency of the sleeve valve engine, the type of which is being used in conjunction with the G.E. 25-kw. type generator, is about 85 deg. C.

The following is a sample of test made on two buses. The first bus, No. 278, was found to be efficient and the second, No. 512, inefficient. Each of these tests, as listed in the table below, was made before inspection.

From the above data it will be seen that there is a vast difference in the output of these two vehicles, and therefore, in order to preserve the life of the power unit so that the gas and oil consumption may be

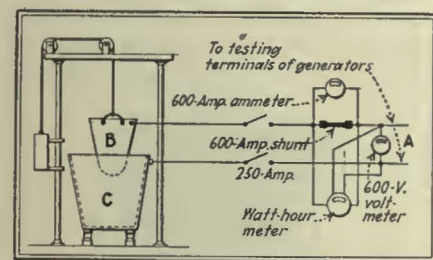


Diagram of Connections Between Switchboard and Liquid Rheostat

brought down to its lowest figure, buses similar to No. 512 must be checked and remedied. The advantage of a water rheostat test is that only power plants showing marked inefficiencies need be torn down for repair.

A copy of the foregoing test is handed to the garage foreman before an inspection of the vehicle is started, and when a bus has the same performance as No. 512 the foreman will make a personal inspection of the power plant of this bus in order to determine the method to be employed in overcoming this discrepancy.

Records are kept of the complete performance data on each bus so that when a defect of any nature is reported, either in operation or otherwise, the same may be checked for repetition.

In addition to the conventional service in checking bus power plants the Philadelphia Rural Transit officials have found the rheostat beneficial in many ways, such as testing newly developed features for added economy, checking gasoline consump-

tion, timing, etc. In fleet operation of gas-electric buses water rheostats of the character described play an important part in reducing maintenance costs to the minimum and reducing trouble in operation.

Carborundum Track Brakes

TESTS have been made on a few street railway lines in Europe, including those at Zurich and Basle, with track brakes having a braking surface of carborundum. Two shoes on each side of the car are attached to the truck frame of the single-truck car and are pressed down on the track by air. No sand is required to secure a quick stop. This type of brake is recommended for emergency use only, because it produces considerable wear on the head of the rail.

Plate Glass Chip Guard Used in Detroit

MANY safeguards are used in the shops of the Department of Street Railways, Detroit, Mich. The view shows a simple plate glass guard mounted in a wood frame and ar-

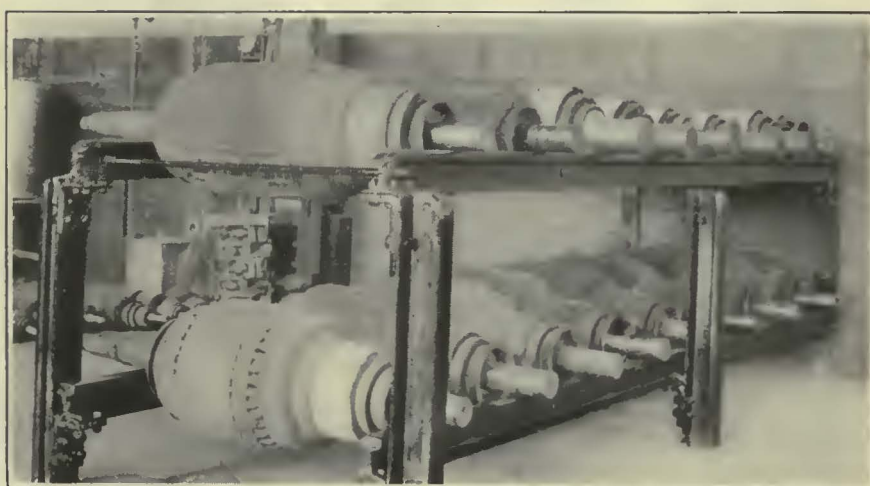


Plate Glass Protects Operator from Flying Chips

surface. The glass is so small that its replacement is simple when its condition hampers clear vision.

Attractive Armature Rack Made from Old Rails

DOUBLE-DECK armature racks of the type shown in the accompanying illustration, two in number, are used for storage of armatures in the electrical department of the shops of the Erie Railways, Erie, Pa. The upright and horizontal supports for these racks are made of



Armature Racks Made of Discarded Rails as Used in the Shops of the Erie Railway

ranged in an adjustable holder to fit over the tool clamp of a lathe. Good vision can be gained at the same time, eliminating the possibilities of chips flying into the operator's face.

In time the steel chips flying against the glass guard scratch the

discarded T-rails. The uprights are set in the concrete shop floor and the horizontal members are bolted to these through angle supports at each upright. The racks provide capacity for sixteen armatures. They are 4 ft. high and 12 ft. long. The width of the rack is made sufficient to accommodate the longest type armature used. In placing smaller sized armatures in the rack, which have shafts so short that they will not extend the full width, a pipe is applied over the shafts, at the pinion end, to give the necessary extension.

Bus	Temperature of day, 26 deg. C. Date	Amperes	Volts	R.p.m.	Water Temperature	Remarks
278	9-3-25	200	206	1,385	70	Wide open throttle
		300	118	1,070	75	
		400	77	1,010	85	
		Kilowatt-hours per gallon of gasoline, 5.35.				
512	9-3-25	200	167	1,165	56	Wide open throttle
		300	96	1,115	60	
		400	64	875	70	
		Kilowatt-hours per gallon of gasoline, 4.52.				

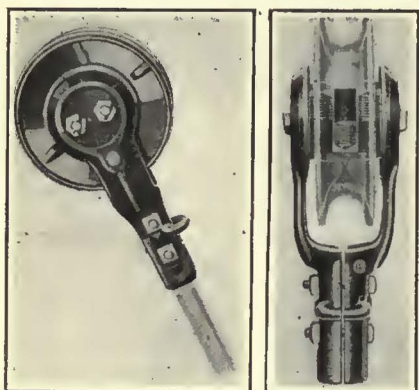
New Equipment Available

Trolley Wheel and Harp

EXCLUSIVE manufacture and sale of a special trolley wheel and harp made under licensed patent owned by T. M. Feist, master mechanic Sioux City Service Company, Sioux City, Iowa, has been taken over by the Ohio Brass Company, Mansfield, Ohio.

The wheel has been adopted as standard on a number of street railway properties and some 1,500 are at present in use. Features of the device are the large axle, providing a considerable bearing area and containing graphite slugs which are pressed outwardly by springs against the bearings of the wheel to provide lubrication. By virtue of this large bearing and special type of lubrication, mileages on the wheels are obtained which average considerably more than the life of the ordinary wheel, according to records kept on a number of properties.

A split harp is used and is fastened to the axle by means of two bolts extending through the axle. This tight clamping of the large machined surfaces between harp and axle provides a low resistance path



At Left, Side View of Trolley Wheel and Harp. At Right, Ample Bearing Area Makes Current Collection Easy

for the current, giving unusually large current collecting capacity without the use of a shunt. It is a feature of this device that it is unnecessary for a carhouse man to lubricate the wheel, as it is claimed that these units will average more than 15,000 miles without any lubrication attention.

Other features of the wheel are the shape of groove used and the particular composition of the metal, which gives an exceptionally tough wheel and contributes materially to

the long life obtained. The manufacturer claims that trolley wheel expense can be cut to one-third by using this device. For the past three years the device has been marketed by the Dayton Manufacturing Company, which also manufactures other devices under patents of Mr. Feist.

Overload Relay Is Redesigned

REDESIGN of the temperature overload relay manufactured by the General Electric Company, Schenectady, N. Y., has been made. This relay has two heating elements connected in each two phases, so that complete protection is provided for single, two or three-phase motors. On direct current circuits the heating elements are connected on each side of the line.

The improved relay is known as the form C or PC-121-C. The improvements in design allow the use of renewable heating elements, prevent the bending of thermostatic strips by operators and include a better mechanical construction. The relay is reset by means of a cord and button suspended from the bottom.

Brass Cups for Traffic Markers

MARKINGS which will not corrode nor soon wear away have been developed recently by the Bridgeport Brass Company, Bridgeport, Conn., in the form of brass cups to be inserted in pavements where traffic directions are needed. The new traffic spots are made in two diameters, 3 in. for pedestrian lanes and markings and 4½ in. for traffic divisional lines. They are claimed by the makers to be highly visible, easily inserted and requiring no upkeep. They may be inserted in asphalt, macadam, wood block pavement, Amasite, Warrentite and new concrete pavements.

Once the layout for any particular marking is made, the insertion in the pavement is accomplished by pounding with a flat-faced cast-iron road tamper. Another method which is considerably faster is to lay down the spots where marked and run a steam roller over them.

The new traffic spots are particularly recommended by their manufacturers for use in such markings as street car safety zones, school stops, on dangerous curves and in substitutions for police officers where traffic is light.

Improved Features in Plug Fuse

SEVERAL distinctive features are incorporated in a new non-renewable plug fuse recently placed on the market by the Trico Fuse Manufacturing Company, Milwaukee, Wis., under the trade name of "Cleartop." The fuse consists of a separate porcelain base and body. The base has a long baffle chamber which extends to the inside top of



Body of This Non-Renewable Fuse Is Treated Porcelain, with a Rugged Knurl to Give a Good Gripping Surface

the body and holds the mica window in place. The body and base are held together by a heavy brass screw shell. The body is finished in a dull black, giving the appearance of molded insulation.

Some of the distinctive features are provision of a large rugged knurl around the top edge to afford a good grip when tightening. The fusible strip is made from accurate material and has a restricted blowing portion; each strip has the rated current stamped plainly on the top and is visible through the mica window. The screw shell is made of heavy-gauge hard brass, threaded completely. It is rigidly fastened to the body and cannot become loose. The lower end or fusible strip is securely soldered to the bottom contact. The other end is soldered at the base of the screw shell. A vent space is provided around the base so that the gases escape along the exterior of the base within the body and are gradually released along the base. The body and base are molded from a high grade of porcelain. The base supports the mica disk as well as the fuse strip and acts as a fire-proof barrier to prevent interior flashovers. A large center contact is riveted to the base.

Association News & Discussions

Welding of Pipe and Pressure Vessels Discussed by Welding Society

WELDING practice as used by electric railways did not form a particular part of the discussion at the annual meeting of the American Welding Society, held April 21-23, in the Engineering Societies Building, New York City. There were, however, several contributions dealing with practical welding problems, particularly relating to piping installations and pressure vessels. Other features were a review of the progress in gas and arc welding, a general symposium on the subject of design, and an inspection trip to the plant of the Metals & Thermit Corporation. There was considerable discussion of research problems in the session devoted to the American Bureau of Welding, and a dinner-dance was preceded by spectacular demonstrations of the properties of liquid oxygen.

New officers for the ensuing year were elected as follows:

F. M. Farmer, president; E. M. T. Ryder, first vice-president; R. L. Brown, A. M. Candy and Stuart Plumley, divisional vice-presidents; C. A. Adams, H. M. Hobart, A. E. Gaynor and A. G. Bissell, directors at large.

On Wednesday morning there was held a well-attended meeting of the gas welding committee, of which S. W. Miller, head of the research laboratory of the Union Carbide & Carbon Corporation, is chairman.

At Mr. Miller's invitation, F. R. Low and C. W. Obert, chairman and secretary respectively of the A.S.M.E. boiler code committee, spoke briefly on the "Unfired Pressure Vessel Code" and the attitude of the code committee on welding. It was pointed out that the committee has no actual authority in matters of construction. Its function was rather to crystallize and codify the best existing practice.

A report from the San Francisco section outlined the preliminary program for research on the strength of welds at high temperatures. This work, in which Leland Stanford University and the University of California are co-operating, will be limited at the start to welds made with commercial welding rods of ordinary firebox steel.

The main feature of the meeting of the electric arc welding committee was a discussion of the results of tests made to determine the effect of such factors as current, size of electrodes, design of joints, positions of welding, etc., as presented by the sub-committee on the fundamentals of arc welding.

This was preceded by a report of the sub-committee on non-ferrous metals. One member reported success in welding aluminum with the electric arc. Another told of the Niagara Power

Company's practice in the matter of repairing eroded impellers of hydraulic turbines. These are renewed by arc welding with phosphor-bronze rods.

In a discussion of single-V versus double-V welds (in steel plate) several spoke in favor of the single-V weld as ample for many purposes. Samples were shown of square-end and single-V welds made with a grooved copper backing plate to give excess metal on the back side. The results of tests to determine the effects of size of electrodes, design of joints and other factors on the properties of electric arc welds were presented by H. L. Warner, General Electric Company. There was some disagreement as to the interpretation of the results obtained.

At the Thursday afternoon session S. W. Miller of the Union Carbide & Carbon Research Laboratories,

presented a paper on the "Design of Welded Joints with Special Reference to Pressure Vessels," while L. H. Burkhardt illustrated design methods by the details of design and manufacture of a welded pressure vessel to meet specific requirements.

The annual meeting of the American Bureau of Welding, which is the research department of the society, took place Friday morning, April 23. Prof. C. A. Adams stressed the importance of fundamental research in the welding field. Some fundamental problems needing investigation in the electric-arc, gas-welding pressure-vessels and structural welding field were outlined.

Two important investigations are being proposed; one in the field of unfired pressure vessels as a joint investigation with the A.S.M.E. to secure information needed by the boiler code committee and designing engineers. The other investigation is being proposed in the field of fabrication of structural steel, in which co-operation is being sought from the American Institute of Steel Construction.

COMING MEETINGS OF *Electric Railway and Allied Associations*

May 6—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass. 3.30 p.m. and 6.15 p.m.

May 7—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York City, 8 p.m.

May 13—Central Electric Railway Master Mechanics' Association, Orlando Hotel, Decatur, Ill.

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wisconsin.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

Central Electric Penny Coupon Tickets Considered

CERTAIN lines have signified a desire to become party to joint passenger tariff No. 37 of the Central Electric Traffic Association covering the interchangeable 2,000 penny coupon ticket. It was decided at the meeting of the association held on April 21 that before reissuing the tariff an opportunity be given all lines in the association to participate therein if they so desire.

Lines now party to the tariff will be carried forward in the reissue on the same basis as in the present tariff unless advised to the contrary. Lines not party to the tariff are requested to advise Secretary L. E. Earlywine at once if they desire to participate, and if so state whether they will sell the tickets or only honor them.

The only change in the rules will be a provision to make half-fare detachments, which is prohibited in the present tariff. The rate will remain the same as at present, \$17.50 for \$20 in transportation.

Progress Is Made in International Standardization

AT THE third international standardization conference, held in New York City during the past two weeks, several subjects of interest to electric railways were considered. The meetings were held under the auspices of the American Engineering Standards Committee and delegates of eighteen national standardizing bodies were present. At previous conferences the committee on traction motors had reached complete unanimity except on two points, on which decision had been reversed by the French delegation. The

points in the report were: (1) Application of I.E.C. rules to all types of traction motors. (2) Two classes of I.E.C. ratings, one hour and continuous. (3) Temperature rises. An ambient temperature of 25 deg. C. was chosen as a basis for comparable tables. Temperature measurement by resistance method was favored, but thermometer measurements were permitted under certain conditions. Temperature rises were specified. (4) Conditions of excitation during the test must correspond to the ratings of the motor. (5) The voltage during test of ventilated motors should be the rated voltage for both continuous and one-hour rating tests. For totally inclosed motors the one-hour test should use standard voltage and continuous rating test should use either three quarters or one-half rated voltage as specified in the particular case. The points in the report enumerated above were approved.

At another meeting the possibility of arriving at a compromise between British standard Whitworth and American national standard screw threads was discussed. Sir Richard Glazebrook, former director of the National Physical Laboratory of Great Britain, and who represented the British Engineering Standards Association, read a paper on a slightly modified screw thread developed on the basis of a suggestion by a member of the American sectional committee on screw threads. This screw thread would have an angle of thread of $57\frac{1}{2}$ deg., which lies midway between the 55 deg. angle of the British standard Whitworth thread and the 60 deg. angle of the American national standard thread. If this thread is adopted there will be no difficulty in mating a bolt threaded in the new way with a nut either of the British standard Whitworth or the American national standard tapping.

Definite action was not taken at this conference, but it was decided to have the proposal circulated among the different national standardizing bodies in order that they might study the proposition.

At another conference the question of international standardization of bolts and nuts was considered. Representatives of the sectional committee of the American Engineering Standards Committee presented reports showing tentative standards which had been agreed upon and which it was thought would ultimately be adopted. Sir Richard Glazebrook, the British delegate, described experiments which the British association had been making, which seemed to indicate that much smaller nuts and bolt heads than now used in England could be adopted with satisfactory results and at less cost than the ones now used in England. In order to make further progress in standardization of bolts and nuts, the conference formally requested the British Engineering Standards Association to continue the experiments which it is making and all other national standardization bodies were requested to send to the British Engineering Standards Association any tentative standards which they are considering or standards which have been adopted by various manufacturers in different countries. These are to be analyzed and tabulated

by the British association and then circulated to all of the twenty national bodies for consideration in connection with further proposals toward international standardization.

Central Master Mechanics Meet May 13

IN ACCORDANCE with the action taken at the last meeting the next regular meeting of the Central Electric Railway Master Mechanics' Association will be held at the Orlando Hotel, Decatur, Ill., commencing at 10 a.m., Thursday, May 13. Hotel reservations should be made through J. D. Barnhart, Box 97, Illinois Traction System shops, Decatur, Ill.

"The Care of Air Brakes with the View of Obtaining the Maximum Degree of Efficiency and Safety" is one of the subjects for discussion. "The Painting of Cars, Brush vs. the Spray Method" is a second subject.

In addition to these two papers the program will include reports of committees, including the report of the special committee on freight car lighting, general business, and the open forum.

After the conclusion of the regular program an opportunity will be given to visit the shops of the Illinois Traction System at Decatur.

New England Club Meets May 6

"**M**ATERIALS and Supplies—How to Economize" will be the subject of a symposium at the afternoon meeting of the New England Street Railway Club to be held at the Copley Plaza Hotel, Boston, on Thursday, May 6. The meeting will be called to order at 3:30 p.m.

Short talks will be given as follows: "Co-ordinating the Work of the Engineering Force and the Purchasing Department," by George E. Haggas, chief engineer Cumberland County Power & Light Company, Portland, Me.; "Quantity or Seasonal Buying vs. Hand to Mouth Buying," "Manufacturers' Standards and Specifications vs. Company Standards and Specifications," "Policy of Manufacturing Supplies by Railway Companies," by R. S. Baldwin, purchasing agent the Connecticut Company, New Haven, and A. B. Fuller, purchasing agent Union Street Railway, New Bedford, Mass.; "Storeroom Practices," by William F. Crowe, corporation secretary Springfield Street Railway, and R. A. Weston, special accountant the Connecticut Company, New Haven; "Control of and Reduction of Inventory," by W. F. Maher, storekeeper United Electric Railways, Providence, R. I.; "Monthly Budget System," by Thomas F. McGarry, purchasing agent Eastern Massachusetts Street Railway, Boston, and "Simplified Practice and Obsolescence," by William W. Tirrell, statistician, formerly examiner for the Interstate Commerce Commission.

The evening meeting, following the dinner at 6:15 p.m., will be held in the Swiss Room of the Copley Plaza Hotel and will be devoted to the subject "How to Make the New England Street Railway Club of More Value to Railway Companies," by L. S. Storrs, managing director American Electric Railway

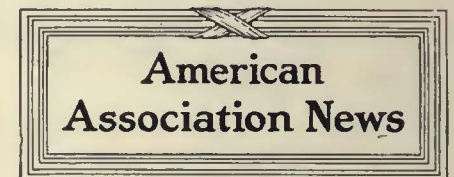
Association, and George E. Pellissier, assistant manager Holyoke Street Railway. "Harnessing Our Energies" will be a spectacular electro-magnetic phenomenon illustrated by experiments never before attempted, by Harry C. White, Edison Lamps Works of the General Electric Company.

Central Traffic Association Constitution to Be Amended

REVISION of the meeting time of the Central Electric Traffic Association was proposed at the meeting of this association held in Akron, Ohio, on March 17-18. The committee on constitution and by-laws presented the following amendment to Article V, Sec. A of the constitution.

The association shall meet on the third Wednesday of the following months: January, February, March, April, May, August, September, October, November and December, the January meeting being considered the annual meeting. Special meetings may be called at any time and place upon the request of twelve members.

This amendment has been brought to the attention of the members in a bulletin from Chairman L. E. Earlywine of the committee. It will come up for action at the next regular meeting of the association.



Engineering Symbols

VARIOUS groups of symbols which are to be included in the report of the special committee on engineering symbols of the American Electric Railway Engineering Association were decided upon at its meeting held at association headquarters, New York City, April 20. Those present were: H. W. Coddington, chairman; J. D. Kent and C. W. Squier. The committee analyzed a large amount of material and agreed upon the symbols most used by electric railways. These were grouped into the following classifications: Topographical, railway signal symbols, electrical symbols, mathematical symbols and general railway symbols.

Final drawings are being made up of all the symbols which in the opinion of the committee should be included in this report.

Metropolitan Section Aims for Membership of 1,500

SETTING a bogey of 1,500 for membership at the end of the current year the Metropolitan Section, A. E. R. A., is making real efforts to reach this goal. The bulletin of the April meeting gave the membership figure as 1,182. Attention was called to the attendance at the monthly meetings, which has been considerably under a satisfactory total for some time. Members were urged to form the habit of regularly setting aside the first Friday of each month for the section meeting. An expression of individual preference for a summer outing or an October smoker was asked from the members.

The News of the Industry

Taylor Grant of Cleveland Railway Amended

The Cleveland Railway, Cleveland, Ohio, was granted a new franchise by the City Council on April 19. The new grant is a modernized version of the Taylor ordinance. It will run until 1950. It authorizes the Cleveland Railway to operate buses, creates a metropolitan transportation board of four Clevelanders and one member for each suburb, permits the company to pay 2 per cent commission on stock sales, raises the possible maximum fare to 10 cents instead of 6 cents, fixes the rate of fare in contiguous suburbs 1 cent higher than the Cleveland rate and changes the interest fund.

Under the amended franchise fares will go up if the interest fund falls below \$500,000 and fares will go down if the interest fund rises above \$1,100,000.

The new franchise was passed by the Council by a vote of eighteen to six. The Council previously had turned down a proposed amendment which would have forced recognition of the union.

W. R. Hopkins, City Manager, declared that the railway will now be in a position to attract private capital and to command an ample market for the sale of its securities in order to solve the city's transportation problems. The amended franchise will become effective on June 5. The Cleveland Federation of Labor has threatened to initiate a referendum on the amendments.

Following passage of the amendments the stock of the company jumped three points to 96½, and it is planned to sell \$4,000,000 of stock as soon as the quotation reaches 100, or par.

John J. Stanley, president of the company, said the company will accept the new franchise. He ordered a notice posted in all carhouses giving the platform men an increase in pay. Effective May 1, 1926, and until further notice, the wage scale for motormen and conductors will be 65 cents an hour for the first three months of service, 68 cents an hour for the next nine months and 70 cents an hour thereafter. This is an increase of 5 cents an hour. All working conditions will remain unchanged.

Preparing for the Operation of Rochester's Canal-Bed Line

That the railroad built by the city of Rochester, N. Y., in the bed of the abandoned Erie Canal will be in operation this fall was indicated by action of the Board of Contract and Supply in awarding bids for bridge construction, specifying that the work must be done by fall.

No decision has been reached as to who will operate the line when it is completed. It is regarded that the New York State Railways, operating the local

trolley system, is the only company equipped to take over the railroad. Municipal operation, it is believed, will not be deemed practicable.

The section of subway to be in use first will be from Oak Street, its western terminus on the west side of the city, to connections with two electric and two steam railroads in the extreme eastern outskirts. The line bisects the heart of the city. An overhead street of a mile has been built in the business section.

Although the Erie Canal, long since abandoned, traverses Utica and other New York State cities, Rochester is the first to make this use of the old "big ditch" of George Clinton.

The city railroad will connect with all the steam lines entering the city and will do considerable freight hauling and switching besides taking care of all interurban trolley traffic entering Rochester.

Pittsburgh Considers Subway

City Transit Commission Indorses Turner-Haydock Plan and Proposes \$30,000,000 Bond Issue—Rapid Transit Line to Be Operated by Pittsburgh Railways

ANOTHER step toward providing Pittsburgh with rapid transit is taken in the report recently submitted to the Mayor and City Council by the City Transit Commission. It approves the immediate construction, after the financing preliminaries have been arranged, of the first part of the rapid transit system recommended by Daniel L. Turner, consulting engineer, and Winters Haydock, chief engineer, of the Department of City Transit. It also includes a report by these engineers supplementing that presented on Jan. 23, 1925, and published in abstract on page 409 of the issue of this paper for March 14, 1925.

The sections approved are a subway from the vicinity of Federal and Ohio Streets on the north side, by way of Federal Street and Fifth Avenue at least as far as Neville Street, in the Shadyside district, to be used by rapid transit trains, and another subway, less than a mile in length, on Grand Street, in the downtown section, crossing the other at right angles, to be used temporarily by surface cars. Later, this would form part of a rapid transit line.

The City Transit Commission recommends the construction of these lines by the city and their lease to the Pittsburgh Railways under a contract of a nature similar to that under which the present surface railway system is operated, or under a "service at cost" franchise. Under this contract the railway would supply the rolling stock, electrical equipment and terminals. The city's contribution would be \$36,000,000 and the railway's \$4,860,000.

A study of operation is under way by a committee of citizens named by Mayor Clarence D. Van Zandt and headed by John P. Morse.

The city board has also authorized bids for electrical wiring for the road.

New Franchise Suggested at Fitchburg

The Fitchburg & Leominster Street Railway, Fitchburg, Mass., will seek a new franchise in that city to include the operation of buses as part of a scheme for extensive reorganization. The new franchise seeks to establish the right of the company to operate buses over a score of streets and into sections not now served by trolleys. If the new franchise is granted the right to operate buses in the city would be limited to the railway, with adequate provision made for the development of the service in the interest of the public.

The report of the engineers declares that by the rerouting which would follow the opening of the north side subway in 1932 the railway could save 4,250,000 surface car-miles by the substitution of 2,240,000 rapid transit car-miles. On a basis of 30 cents per car-mile for the former and 25 cents per car-mile for the latter, a net saving in operating cost for the year of \$715,000 would be obtained. If the company substituted one-man cars on its remaining surface routes, it would make an additional saving of \$595,000, or a total possible yearly operating saving of \$1,310,000 as of 1932, due to the construction of the proposed rapid transit line. From the operation of the Grand Street subway it is estimated an additional saving of \$112,000 could be obtained.

The engineers recommend that from this net gain of \$1,422,000, which does not include any allowance for increase in traffic, \$291,600 could be taken to pay the additional carrying charges of the company required under the plan. This would leave about \$1,130,400 to be applied toward the carrying charges of the bonds issued by the city. The city has already authorized an expenditure of \$6,000,000 for subway purposes, so that an additional \$28,940,000 is required to pay for the subways without equipment, but a considerable part of this, as explained, will carry itself. The commission therefore recommends a referendum at the next election on the question of authorizing the city to float an issue of bonds to the amount of \$30,000,000.

\$22,000,000 Order Issued

New York Commission Votes Two to One to Require Interborough to Proceed with Plans

Orders issued by the New York Transit Commission to the Interborough Rapid Transit Company, New York, require that company to spend approximately \$22,000,000 on lengthening station platforms and buying new cars and equipment. The order requires the company to pay one-half (about \$6,000,000) of the cost of lengthening 56 underground platforms and 23 elevated platforms at local stations to accommodate ten-car trains. The city is required to pay the other half. The order also requires the Interborough to buy 382 new cars, costing about \$10,000,000, and spend about \$6,000,000 for signals, repair sheds, power equipment, etc.

ORDER EFFECTIVE JULY 1

The order becomes effective on July 1 next. Chairman George McAneny and Commissioner Le Roy T. Harkness concurred. Commissioner John F. O'Ryan filed a dissenting opinion. He held that lengthening platforms constituted "new construction" rather than "additions" to the Interborough system, and, therefore, was not included in the provisions of the dual contracts under which the order was issued.

Mr. McAneny in his opinion stated the subway division of the Interborough system showed a good profit and its losses were due to the lease of the elevated lines. He declared the company could find money to finance the improvement even if it were forced to go through bankruptcy to dissolve its unprofitable elevated lease.

The opinion of Messrs. McAneny and Harkness stated in part:

The Interborough company, as a single corporation, is operating two separate railway systems—(a) the system of subways it has leased from the city under Contracts Nos. 1, 2 and 3, and (b) the system of elevated lines it leased from the Manhattan company in 1903, for a 999-year term. In pleading its financial situation it presents, and asks that the commission take into account the joint financial statement of both its subway and elevated lines. Upon such a joint statement the company, for its last fiscal year ended June 30, 1925, showed a net deficit of \$345,508.

The losses on the Manhattan elevated division for the year—figured after the payment of \$3,065,310 by way of rentals to the holders of Manhattan company stock—were \$4,533,757. During the same period the earnings of the company under the subway lease, over operating costs and financial or other charges of every description incidental to its operation under those leases, was \$4,188,249. The net deficit stated for the year is the product of the merging of these two sets of operating results.

The indicated profit from the subway division for the current fiscal year—that is, for the year that will end June 30 next—is \$5,500,000.

SUGGESTS HELP FROM CITY

Chairman McAneny suggested that the city might raise the money and lend it to the Interborough as the city can borrow more cheaply than the company. He made the alternative suggestion that the city might alter its contract with the Interborough so as to pay the entire cost of lengthening the platforms, on the ground that the city is a partner of the Interborough and will benefit by the improvement.

Officials of the Interborough Rapid Transit Company refused to comment

on the decision, but it was stated that the company hopes the matter may be arranged without litigation and without forcing a receivership.

Brotherhood Will Handle Own Benefits in Kansas City

The Benefit Unit of the Kansas City Railways Employees' Brotherhood of Kansas City, Mo., was recently organized and later authorized by a decree of the Circuit Court of Jackson County. The brotherhood health and accident benefits, which have for the past seven years been underwritten for it by the Massachusetts Bonding & Insurance Company, will be administered by the Benefit Unit. The necessity for making the change was brought about by the Massachusetts Bonding & Insurance Company serving notice of an increased rate effective March 1. After an examination of the experience of the carrying company for the past three years, it became apparent that with a low administrative cost the brotherhood could itself handle these benefits at the rate formerly paid the Massachusetts company and grant benefits similar to those allowed in the past. The articles of agreement provide that the Benefit Unit is a corporation organized solely for beneficial purposes and not as a profit-making venture. This change does not in any way affect the group life insurance which has been carried for many years by the Aetna Life Insurance Company.

Record-Breaking Weekly Pass Installation at Wheeling

Weekly passes greater in variety than have heretofore been installed at one time will be put into effect on May 3 by the Wheeling Traction Company, Wheeling, W. Va. This company's patrons are already familiar with the Sunday-holiday pass, of which twelve types are in use. The weekly passes will number eighteen types, as follows:

RECORD-BREAKING WEEKLY PASS INSTALLATION AT WHEELING		
Name of Pass	Riding Limits	Price
Wheeling	Eighth Street, Benwood, and Stop 1, Wheeling	\$1.00
Greater Wheeling	Eighth Street, Benwood, and Stop 24, Warwood	1.25
McMechen	Stop 19, McMechen, and Stop 1, Wheeling	1.65
Moundsville	Moundsville and Stop 1, Wheeling	3.25
Glendale	Stop 21, Glendale, and Moundsville	0.85
Wellsburg	LaBelle Mine, Wellsburg, and Steubenville	2.75
Follansbee-Steubenville	Follansbee, south corporation limits, and Steubenville	1.50
Univeraal	All routes	5.00
Weirton	Steubenville and Weirton	2.25
Brilliant	Steubenville and Brilliant	2.00
Mingo	Mingo, south corporation limits, and Steubenville	1.00
Brookside	Fourteenth Street, Wheeling; Aetna Street, Martins Ferry; Stop 14, Brookside, and Stop 9, West Wheeling	1.00
Martins Ferry	Fourteenth Street, Wheeling, and Stop 6, Martins Ferry	1.25
Ohio	Fourteenth Street, Wheeling, Stop 6, Martins Ferry; Stop 26, Lansing, and Stop 27, Bellaire	1.75
Shadyside	Fourteenth Street, Wheeling; Shadyside, Stop 6, Martins Ferry, and Stop 26, Lansing	2.50
Linwood	Fourteenth Street, Wheeling, and Stop 40, Linwood	2.00
Ohio Terminals	Fourteenth Street, Wheeling; Rayland, Barton and Shadyside	3.00
Beech Bottom	Eighth Street, Benwood, and Stop 51, Beech Bottom	2.00

The present basic cash fare of the Wheeling Traction Company is 8 cents, with ticket rates of 5 cents (ten for 50 cents) in West Virginia and 5 5/9 cents (nine for 50 cents) in Ohio, but there are also combinations making use of 6 1/4-cent, 7 1/7-cent and special commutation rates. The prices of the passes range from eleven to twenty times the fare of riders on tickets, depending upon the nature of the traffic.

Committee of Chicago Aldermen on Tour of East

Chicago Aldermen, on tour to inspect the transit situation in various cities of the eastern United States and Canada, arrived in New York on April 28 and are at the Waldorf-Astoria.

The committee has visited Detroit, Cleveland and Philadelphia and will leave for Boston on May 1, after which it will stop at Montreal and Toronto, returning to Chicago May 6. Joseph B. McDonough, chairman of the committee, said:

Chicago is planning to build subways from "the Loop" district, into which 700,000 pour daily. We are told that New York City made a mistake in not building its subways by special assessment instead of out of its transit fund, and we are here to investigate the subway problem. Philadelphia is making great progress, but doesn't seem to know what to do with her subways after they are built.

New Franchise at Richmond Ready for Council

At the conclusion of a three-hour discussion on April 27 the streets committee of the City Council of Richmond, Va., practically completed its report on the proposed blanket franchise to be submitted to the Common Council on May 3. Vice-President W. E. Wood and Counsel T. Justin Moore for the Virginia Electric & Power Company said that in the main the grant meets with the approval of the company. After a few unimportant amendments, the document was recommended for approval.

At 5 o'clock Monday afternoon, May 3, the committee will review the finished document and forward it to Council that night for discussion at a date to be fixed later.

There was considerable discussion as to the right of the city to fix a valuation of company's property, but it was finally agreed that the figure of \$9,494,800 set in the Virginia State Corporation Commission's valuation for rate fixing was probably the most equitable. This figure is a compromise between

the valuations made by Stone & Webster and John Beeler, the latter employed by the city. The committee expressed the belief that the proposed valuation and the accompanying features of the franchise were the best obtainable. With this unanimous report from the streets committee, it is believed the document will have clear sailing through both branches of City Council.

Violation of Labor Contracts Before Indianapolis Court

Legal steps, believed to be preparatory moves toward the filing of a motion to have members of the Amalgamated Association cited for contempt of court, were taken in the federal court in Indianapolis on April 24 by attorneys for the Indianapolis Street Railway, Indianapolis, Ind., and the Terre Haute, Indianapolis & Eastern Traction Company, Terre Haute, Ind. On motion of the attorneys, Judge Robert C. Baltzell substituted the name of the Indianapolis Street Railway for the name of the Indianapolis Traction & Terminal Company as the plaintiff in a suit for an injunction which was granted by Judge A. B. Anderson in the federal court in May, 1924, thus bringing the injunction up to date. It was reported that attaches of the Amalgamated Association recently attempted to persuade employees of the two Indianapolis companies to violate their labor contracts with the company. The contract, according to attorneys, provides that the employees of the company shall not quit the service in a body.

Rythmical Vibrations Help Hearing

Recent tests conducted on a trolley car in New York by Dr. Paul Winslow, otolaryngologist, Dr. E. L. Cross, principal of the Wright Oral School for the Deaf, and F. W. Melano, representative of Dr. E. E. Free, who recently located the noisiest corner in New York, resulted in declaration by three deaf men that rythmical vibrations enabled them to hear better. First a voice test was made and then two other tests of a more mechanical nature. A student from the Institute for the Improved Instruction of the Deaf signified that he heard the buzzing of an audiometer at a distance of 25 in. when the car was still, and could make out the noise when the trolley rattled at a good speed. The other test, in which the audiometer was set at its maximum intensity of 100 so that an almost totally deaf person could hear it, was productive of similar results.

Final Westchester Rapid Transit Report Is Submitted

The final report of the Westchester County Transit Commission on the proposed rapid transit system between downtown New York and principal cities in Westchester County has been presented to the Board of Supervisors of Westchester County. It includes a report by the engineer of the commission, Henry M. Brinckerhoff, dated March 1, together with the text of Mr. Brinckerhoff's report of Dec. 15, maps, etc. Previous references to this proposed rapid transit system have appeared in the issues of this paper for Dec. 19, 1925, page 1086, and Feb. 7, 1925, page 214.

In its final report the Westchester County Transit Commission reviews briefly the eight other comprehensive plans for caring for New York's suburban passenger service. Some of these, as the transit commission plans of 1924

and 1925 and the New York, Westchester & Boston plan for a distributing system at 125th Street, are not considered satisfactory for Westchester commuters. But the commission does express the belief that a combination is possible between the Westchester plan and the loop in New York City for suburban passengers, proposed by the North Jersey Transit Commission. This possibility is considered more at length in the engineering report of Mr. Brinckerhoff, who believes the two plans can be harmonized and combined with a saving of large sums in construction and greater economy of operation than by building and operating separate systems.

The report also devotes considerable space to the need of cross-country bus lines to act as feeders for the rapid transit system at its northern end. Data on existing bus lines and those for which franchises have been requested are given in the report.

Safety Committees Formed in Springfield

A definite idea of safety with a well-arranged program of activity leading to that objective has been the policy of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio. Its plan includes a carefully selected organization with various committees comprising the general safety committee. H. P. Smith is director of safety of the company and ex officio head of the general safety committee. The accompanying illustration shows the men selected to head the many committees when the annual reorganization meeting was held last fall.

During the twelve months ending Aug. 31, 1925, the Indiana, Columbus & Eastern Traction Company and its subsidiary bus lines, the Dayton & Columbus Transportation Company and the Springfield & South Charleston Transportation Company, carried 2,198,953 passengers without a fatal accident to a

passenger, according to a report made public by J. M. Pogue, general manager. The company operates seventeen daily passenger trains between Springfield and Columbus; eight between Springfield and Lima; eighteen buses between Lima and Columbus and seven buses between Springfield and Lima.

Staten Islanders Want Railway Line Continued

The Staten Island Civic League has drawn up a report strongly opposing withdrawal of the municipal trolley lines and three "trackless" lines contemplated by the city of New York. Copies of the report were sent to the Board of Estimate and the Board of Transportation.

The action, which would result in the removal of the lines, is contemplated on the ground that they are operated at a loss. Five years ago under the Hylan administration the city started the "trackless" trolleys and took over five lines operated by the Midland Railroad. It has since operated them on a 5-cent fare.

Recently it was reported that the venture was costing the city approximately \$250,000 a year. This report was followed by an announcement that the city intended to withdraw the cars unless it could get a substitute company to operate them.

The league opposes the move on the ground that the action would not be in conformity with the city's policy in other regards. It approves a comprehensive bus system, with free transfers from bus to bus and from buses to cars which the buses feed.

Honor for Railway Man.—C. D. Emmons, president of the United Railways & Electric Company, Baltimore, Md., was elected a member of the board of directors of the Baltimore Association of Commerce at the annual meeting of the organization on April 22.



Heads of Committees comprising General Safety Committee
 Left to right, from row—Ralph Mitman, motive power; J. M. Schneider, carhouse and shops; A. N. Allen, conductors, and Samuel Black, maintenance. Rear row—F. N. Malling, agents and clerks; Charles Killinger, buses; L. K. Linkhart, motormen; Henry Alpie, general offices, and Fred Harman, freight division.

Ten Cents in Sioux Falls— Paving Relief Granted

At the annual city election in Sioux Falls, S. D., on April 20 the people voted to raise the railway fares of the Sioux Falls Traction Company to 10 cents, the same as the present bus fare, with tokens sold fifteen for \$1, instead of seventeen as at present. The car fare has been 6 cents. The granting of the right to the company to raise its fares was given by nearly a two to one vote. The opposition registered 1,851 votes and the advocates totaled 3,612. With reference to its petition for relief from paving the company won by only a majority of 390.

A committee recently investigated the precarious situation alleged to have existed on the Sioux Falls property and the admitted operation at a loss. It recommended relief for the traction company in order to keep cheap transportation in all parts of the growing city after noting a decrease in patronage, increase in operating expense and a loss in gross revenue. The report of the committee also stressed the loss in bus business. The buses, which started operation in 1923, produced a net revenue of \$2,149 in 1924, but in 1925 produced a net loss of \$2,048. The number of passengers also fell off in 1925 compared with the number carried in 1924; that is, from 598,511 in 1924 to 557,682 in 1925. The committee's report was submitted to the City Commission, with the result that the ordinances were passed for submission to the voters on April 20.

Vote to Relieve Beaver Valley Property of Paving Burden

Citizens of Monaca, Pa., recently adopted a resolution to relieve the Beaver Valley Traction Company, New Brighton, of its obligation to pave between the rails in Monaca, in the event that it agrees to reconstruct its tracks with steel ties on concrete foundation. The resolution came after a citizens' meeting with the Council to discuss the responsibility of the company in paving its part of Pennsylvania Avenue and Ninth Street. C. D. Smith, general manager of the company, presented figures and charts of the operation of the street cars in general in the valley, and also the operation and maintenance of the system in Monaca. The operation of the cars in Monaca showed a deficit of approximately \$5,000 last year, and for that reason the company could not financially assume the expenditure that would be required in taking care of the company's share of the paving as specified in the franchise under which the company was operating.

Mayor Grants San Francisco Men Forty Cents Increase

Mayor James Rolph, Jr., of San Francisco, Cal., instructed the Board of Public Works on April 21 to award platform men employed by the San Francisco Municipal Railway a wage increase of 40 cents a day. The increase will raise the daily pay of platform men to \$5.80. It will not, however, affect the salary of trackmen,

repair men, janitors, or clerks. The increase will be paid out of the present income of the road and will not necessitate an increase in the present 5-cent fare.

The railway officials told the Mayor that there was a surplus of \$90,000 in the operating fund of the road that might be applied immediately toward the raise, and that the income of the line would be sufficient to meet the increased overhead.

The Mayor's order came after an eighteen months campaign waged by the employees of the municipal railway for an increase in pay. The original demand was for an additional \$1 a day. When it appeared that this was impossible of fulfillment, the amount was reduced to 60 cents a day. The 40-cent increase suggested by the Board of Supervisors was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 17, page 691.

North Shore & Waukegan Incorporated

To provide a legal means of adding to its electric railway service and putting on buses and taxicabs in Waukegan, Ill., city service the Chicago, North Shore & Milwaukee Railroad recently incorporated the North Shore & Waukegan Railway. The Chicago, North Shore & Milwaukee Railroad operates city service cars and also certain trains on its main line in the town of Waukegan. Questions arose about the legality of expansion under the present charter, so new articles of incorporation were filed, in which certain department heads and officials of the parent company were named. The capital of the new company is \$2,000. The incorporators are Warren Nichols, Joseph M. Griffen, Frederick E. Stout, Frank L. Wolf and A. C. Spier.



News Notes

Beach Service Resumed.—With the resumption of service by the Nantasket Beach Steamboat Company, Boston, Mass., the electric railway operated by the New York, New Haven & Hartford Railroad on the Nantasket Beach branch between Nantasket Junction and Pemberton has also been started.

Wants Cars in Baltimore Rerouted.—The Baltimore Traffic Survey Commission has petitioned the Maryland Public Service Commission for an order requiring the United Railways & Electric Company to reroute its cars in accordance with the outline of the survey commission's report. The Public Service Commission has set no date for a hearing. The hearings will be public.

"News and Views" Chosen.—In a contest conducted among the patrons of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., to select an appropriate title for its new publication containing news of the company's activities the name of "News and Views," submitted by two Milwaukeeans, was selected by the judges as the best. Each received the prize award of \$100. This news bulletin will

appear at frequent intervals in company cars and buses.

All's Well in Virginia.—The people of Virginia are pulling together for the progress and development of the state, in the opinion of the Virginia Electric & Power Company expressed in a letter by Luke C. Bradley, president, to the stockholders. The letter states that matters inside the company and agencies outside the company are all working to push the expansion program of the company. Stockholders were urged to write to the company frankly on any matter pertaining to company operation.

Railway Helps Community Fund.—The Memphis Street Railway and the Memphis Power & Light Company of Memphis, Tenn., on April 14 submitted a joint subscription of \$15,000 to the Community Fund Campaign. This was the largest subscription.

Adjournment in Utica Fare Case.—After examination of several witnesses on April 27 an adjournment was taken by the Public Service Commission to a date to be fixed later in the matter of the application of the Utica lines of the New York State Railways for permission to increase trolley fares. A rate will be fixed after engineers of the commission have completed their inventory of the Utica lines.

Railway Robber Sentenced.—Robert Steele of Carbondale, Ill., who held up and robbed the passengers of the Murphysboro & Southern Illinois Railway 1 mile west of Carbondale several weeks ago has been sentenced to serve from three to twenty years in the southern Illinois penitentiary at Chester, Ill. He pleaded guilty in the Circuit Court at Murphysboro, Ill., April 20.

Railway Service to Mount Royal.—The Montreal Tramways, Montreal, Canada, on April 4 installed a new railway service to Mount Royal, a town of 1,250 population. This new line marks the linking up of Mount Royal with the city by railway. Hitherto the common connection has been through the mountain tunnel by the Canadian National Railways. Mayor Darling of the town said that the new service would be of great assistance to those who are employed in the eastern portion of Montreal. He believed that this line would not be in competition with the Canadian National Railways through the tunnel under the mountains, but would supplement it.

Reward for Accident Prevention Work.—Trainmen of the Oklahoma Railway, Oklahoma City, Okla., are to receive a bonus for accident prevention work. George A. Henshaw, receiver, who explained the plan, said that the total number of accidents each month would be compared with the total for the corresponding month of last year, and for each unit by which the total was reduced the company would pay the trainmen's fund \$10. The trainmen may allow the money to pile up in a fund until the end of the year, then divide it among themselves as a Christmas bonus, or they may use it to defray the expense of a number of entertainments or social events, or in any other way they deem desirable. Automobile drivers and the public in general are asked to help the trainmen increase earnings by preventing accidents.

Recent Bus Developments

Bus Merger Plans Before Indiana Commission

Plans for the consolidation of all insull-owned bus lines in the north-western part of Indiana into one new bus company to be known as the Shore Line Motor Coach Company were outlined before the Public Service Commission on April 22, when a hearing on the proposal was held. This merger was referred to in the ELECTRIC RAILWAY JOURNAL, issue of April 10, page 650. Evidence also was heard at the hearing on another proposal. This provides that the Gary Railways and the Chicago, South Shore & South Bend Railroad buy most of the capital stock of the new Shore Line Motor Coach Company. In all 24 bus lines would be consolidated in the proposal, of which 21 originally were obtained and now are operated by the Gary Railways. The entire purchase price is \$272,188. The Shore Line wants to sell \$400,000 of common stock and to use \$163,546 for necessary additional equipment.

Sightseeing Operation at New York a Subterfuge

Supreme Court Justice George H. Taylor, Jr., at White Plains, N. Y., on April 26 handed down two decisions enjoining the operation of sightseeing buses from New Rochelle to Manhattan.

Action against these companies and the Mount Vernon Sightseeing Bus Company, which previously was enjoined, were brought by the Westchester Electric Railway, a subsidiary of the Third Avenue Railroad, New York. The plaintiff contended the bus companies had not obtained certificates of convenience and necessity.

It was reported in White Plains that the three bus companies will carry an appeal to the Appellate Division of the Supreme Court. The companies mentioned in the injunctions granted on April 26 were the Luna Cars, Inc., and the New Rochelle Sightseeing Bus Company. They operated seventeen buses between New Rochelle and Times Square. Justice Taylor said:

It is admitted that the certificate of convenience and necessity, which under the transportation corporation law I hold to be prerequisite to the lawful operation of its line, has not been obtained. Provisions of Section 25 have been wholly ignored by the operations of the defendants.

Justice Taylor also directed a prompt trial of the case. Albert Davison appeared as counsel for the railway. The permits to the sightseeing buses were issued by the officials of Mount Vernon and New Rochelle.

Kentucky Buses Under New Rule

Kentucky buses are now operating under a new law following the signing of a House bill by Gov. William J. Fields. The bill levies a tax of \$1 a hundred pounds on the gross weight, a license tag fee ranging from \$10 to \$50, according to capacity, and a fee, ranging from \$5 to \$15, on each seat.

It creates the office of Commissioner of Motor Transportation, who has authority to grant certificates of convenience and necessity and fix routes, schedules and fares. Limited review by a circuit court is provided. Certificates are revocable for cause, but are renewable annually on payment of fees. Existing lines are protected.

The law covers all motor vehicle passenger common carriers, including taxicabs, except school and funeral buses, which are specifically exempted. Buses operating entirely within municipal limits are also exempted. The commissioner is permitted to fix the size of the required accident indemnity bond.

Bus Service for Crippled Children at Toronto

Transportation of crippled children by bus began in Toronto, Ont., on April 14. Three buses are operated in the morning and three in the evening with the following routes:

Route No. 1 will be operated by a bus off the Rosedale route, leaving Bloor and Sherbourne at 8:55 a.m., then following Route No. 1 as laid out, arriving at the school around 10 a.m.

Route No. 2 will be operated with a coach running off the Hill route around 8:50 a.m. This coach will travel via Lakeshore Road to the commencement of the No. 2 route and work outward toward Wellesley Street school, arriving there around 9:50 a.m.

Route No. 3 will be covered by a separate bus run off the Jane route, leaving Bloor and Jane at 9 a.m., operating over the route as laid out toward Wellesley Street school, arriving there around 10 a.m.

The total number of route-miles is 55.20. The total number of hours for this work is six hours and 55 minutes, nearly 8 m.p.h., and the revenue derived is approximately 50 cents per bus-mile.

Miss Milne, of the Department of Education, is satisfied with the service.

Route No. 3 operates the separate school bus, commencing at 8:30 a.m., then runs onto the crippled children routes and also does two services in the evening.

These services are not costing the commission anything in the way of bonuses or overtime. Straight time is paid to the amount of six hours and 55 minutes.

Youngstown Company Extends Bus Service

The Pennsylvania-Ohio Coach Lines Company, bus subsidiary of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, recently took over the operation of the lines heretofore operated by the Cleveland, Warren & Youngstown State Company. Permission for the purchase of the lines was granted by the Ohio Public Utilities Commission. With the acquisition of the Cleveland, Warren and Youngstown lines the bus lines of the Youngstown company extend from Cleveland and Akron throughout this region eastward to Sharon, Greenville, Meadville, Conneaut Lake, New Wilmington and New Castle, Pa.

Electric Railway Victor Over Steam Line

The Minnesota Railroad and Warehouse Commission has denied permission to the Northland Transportation Company, a subsidiary of the Great Northern Railroad, to compete with the buses of the Twin City Motor Bus Company, subsidiary of the Twin City Rapid Transit Company, in carrying passengers between Minneapolis and St. Paul. The plan was to operate these buses over University Avenue and to carry local traffic.

The commission allows the Northland to begin on May 15 to run seventeen of its 27 long-distance buses from the Minneapolis terminal to St. Paul over the Franklin Avenue bridge route, but without a provision permitting the buses to take on or drop off passengers en route.

St. Paul had asked that long-distance buses from the north extend the route from the Minneapolis station to St. Paul. The company could come to no agreement with the Twin City company for carrying passengers between the two cities, so it made a move to run through and reimburse itself with carrying local traffic.

The decision is a distinct victory for the Twin City Rapid Transit Company, which now has a monopoly of the passenger business between the two cities by trolley car and bus. The commission said:

This places the local transportation systems of these two cities and suburban points under one directing organization, which should lead to the greatest efficiency of operation and the minimum of cost and



Crippled Children at Toronto Ready to Be Transported

furnish adequate facilities to meet the increasing transit needs of these rapidly expanding communities.

The order to the Northland company authorizes it to extend its Taylors Falls service to Minneapolis from St. Paul.

Certificates of convenience and necessity were granted to the Twin City Motor Bus Company to operate buses (already in actual operation) between the Twin Cities over the Como Avenue, University Avenue and Lake Street routes and between Minneapolis and Glen Lake, with probable change of loop routes in both cities. Slight changes were made in the passenger rate on the latter line.

Commission Has Control of Colorado Buses

Bus lines carrying passengers, freight or express are common carriers under the public utilities act of Colorado and are subject to regulation by the Colorado Public Utilities Commission, according to a decision by the State Supreme Court in the case of the Greeley Transportation Company. Under the decision the commission has power to grant or deny permits to persons or companies for the operation of bus lines in the state and has power to formulate rules and regulations governing the operation of such lines.

Bus Program Put Through by New York Legislature

Practically the entire program advocated by the Public Service Commission and bus transportation interests was passed by the New York State Legislature, which adjourned on April 23. Included in its annual report was a recommendation of the Public Service Commission that bus lines be made common carriers and a separate article of the public service commission law added specifically regulating this branch of the transportation business. This was done under two bills introduced in the Senate by Warren T. Thayer, and now in the hands of the Governor.

Two bills in the hands of the Governor permit bus companies to hold stock in street railroad companies. Both amend the same section (section 54) and the Governor must take his choice as to which he will approve. The Sargent bill provides that such companies organized under the transportation corporations law may exercise such privilege. This bill passed both houses of the Legislature, went to the Governor, was recalled and after the passage of the Thayer bill was again returned to the executive chamber. The Thayer bill permits the exercise of such privilege by any bus corporation, however organized, subject either to the jurisdiction of the public service or transit commission.

In the closing hours of the session the Messer bill passed both houses of the Legislature. This measure permits the substitution, on approval of the Public Service Commission, of buses for cars or trains on tracks of railroad companies or street railways.

Another measure in the hands of the Governor will make it exceedingly difficult for a new bus company to engage in business in New York City. This is

the Wales bill. It amends section 172 of the railroad law by providing, on application for consent of local authorities, written notice of filing such application shall be given to all common carriers operating through territory through which applicant proposes to operate.

Bus Service Planned.—The Key System Transit Company proposes as an improvement in transportation a bus line in Berkeley, Cal., to extend from Gilman Street to Berkeley Place, tapping a thickly settled, recently developed residential district of the city. At present this section has no means of transportation.

New Buses on Market Street Line.—The Public Service Railway, Newark, N. J., put into operation on April 21 on the Market Street line the first of the 333 gas-electric type buses. Three machines are in use for the late rush-hour service especially in Roseville Avenue. Others will be operated on the Bergan line serving Hackensack, Little Ferry, Ridgefield Park, Ridgefield, Fairview, North Bergen, Guttenberg, West New York and Weehawken. The buses operate every fifteen minutes with running time between terminals 55 minutes.

Service Extends to Abbotsford.—The British Columbia Rapid Transit Company, a subsidiary of the British Columbia Electric Railway, Vancouver, Canada, is now operating coaches to Abbotsford, and in the near future will be running through to Chilliwack. This can be done only when the new road across Sumas prairie is ready for traffic. The company has ordered two new coaches similar to those in use between Vancouver and New Westminster.

Proposal for Bus Service Expected.—A movement by the Syracuse & Eastern Railroad, Syracuse, N. Y., to supplant its electric railway lines with buses is seen in the announcement that the proposal to establish bus service between Syracuse and Fayetteville is to be taken up at the annual meeting of the company on May 14. The company has been operating buses from Syracuse to Salt Springs Road and Selley Road for two years.

Will Carry Merriment Seekers to Resort.—A bus service to Fountain Lake, a popular swimming resort northeast of Hot Springs, Ark., on the Little Rock highway, will be started on May 1 by the Hot Springs Street Railway. The buses will be operated throughout the summer and will run on a 45-minute schedule from 10 o'clock in the morning until 11 o'clock at night. A fare of 40 cents for the round trip will be charged; the one-way fare 25 cents.

Buses Will Replace Cars.—The Denver & South Platte Railway, operating between Englewood and Littleton, Colo., about 6 miles, has been authorized by the State Public Utilities Commission to abandon service effective on May 5, tear up its tracks, remove the wires and to substitute buses. The company's plea was based upon the fact that it was losing money. Those who opposed the elimination of the street cars failed to sustain their point. The commission said: "You have failed to support the cars sufficiently to enable the railway to carry on."

New Line Proposed.—The San Francisco, Napa & Calistoga Electric Railway, San Francisco, Cal., has applied to the State Railroad Commission to run buses between Calistoga and Vallejo in conjunction with its present train service. The railway plans to discontinue certain trains if permitted to operate the buses along the highway paralleling the railway.

Bus Service to Replace Stub Line.—Fred N. Carpenter, president of the Carpenter Rapid Transit Company, which operates buses for local service Tonawanda and North Tonawanda, has outlined to the Tonawanda Board of Aldermen plans for increasing the number of bus routes in the city as soon as the International Railway, Buffalo, abandons its Military Road and Kenmore-Tonawanda car lines. The Aldermen favor the Carpenter plan.

Seeks Fare Increase.—The Indiana Service Corporation of Fort Wayne, Ind., operating interurban and bus lines, recently asked the Indiana Public Service Commission for permission to increase fares to a basis of 3 cents a mile on three bus lines the company bought some time ago from private owners and to abandon another line. The line which the company seeks to abandon runs between Fort Wayne and Muncie. The three lines on which more fare is asked are from Fort Wayne to Peru, to Marion and to Auburn and Angola. Insufficient revenue is given as the cause for the rate boost request.

No Loss to Be Suffered by Bus Company.—The Joseph Darst Realty Company has guaranteed the St. Louis Bus Company, subsidiary of the United Railways, St. Louis, Mo., against loss on the new feeder line into the Delmar-Olive division of the railway from the Olive Street Road from as far west as the Woodson Road. Dartsdale, a subdivision on the Olive Street road, was opened several months ago by the Joseph Darst Realty Company, progressive real estate operator. It tried the experiment of operating independently owned buses to its subdivision property, but the results were unsatisfactory. It then decided to present the problem to the St. Louis Bus Company, and the result was this unusual departure in co-ordinated bus and railway service.

Would Compete with Railway.—Application for a 50-year franchise to operate a passenger bus service in the city of South Bend, Wash., has been presented to the City Council by Oscar Oman of the Ocean Beach Transportation Company. The act follows the announcement of the Willapa Electric Company that it had applied to the Department of Public Works to abandon its present railway line in and between the cities of South Bend and Raymond and to substitute bus service. In order to protect the railway ordinances were passed years ago forbidding the operation of buses in the city. At one time the Eager and the Oman company, predecessors of the present Ocean Beach Transportation Company, which operates the stage line through several beach towns, planned to petition for a permit to extend their lines through to Raymond, but were blocked by the railway. The present application will be heard on May 3.

Financial and Corporate

Dividend Passed

Texas Electric Railway to Apply Deferred Dividends on First and Second Preferred to Improvements

For the first time since the formation of the Texas Electric Railway in 1917 payments of dividends on the first and the second preferred stock will be deferred. This decision was reached at a meeting of the board of directors on April 23 after a careful study of estimates of the company's financial position in the years immediately in the future. The drought last year was so severe that not more than half of the normal crop of cotton was produced in the territory served by this railway. Some sections produced only a third of the normal crop, while a few sections in the northern part of the state were not so seriously affected. There is no other one product that affects business in this locality so seriously as cotton and many other utilities operating in this district suffered losses in gross revenue from the same condition.

PROPERTY MUST BE KEPT UP

The board of directors was unwilling to sacrifice the maintenance or improvement of the property to pay dividends, as it is the belief that only by rendering a superior service can the road be in position to compete successfully with the state and county highways and the ever-increasing competition upon them caused by the private automobiles. The directors and management have undertaken to effect economies of operation other than curtailment of maintenance and the betterments planned for the immediate future which will tend to induce new business. Plans for inducing increased riding are already under way, and new plans are being developed that will be announced shortly.

Jack Beall, president of the Texas Electric Railway, made the following statement about the matter to the representative of the **ELECTRIC RAILWAY JOURNAL** in Dallas:

Unfortunate as it is to defer payment of dividends on the preferred stocks, it nevertheless seems advisable at this juncture. Reduced revenues caused by the drought of last year will probably continue until money is again available from the profits of this year's crop of grain and cotton. The excellent weather at the present time has heartened the farmers and they are now planting cotton on extensive acreage. The property has always been maintained in excellent operating condition and the company has been engaged in extensive betterments, including additional ballast and the rebuilding of wood bridges and trestles with steel and concrete structures. On the 100-mile line between Dallas and Waco the 6,500 ft. of wood bridges existing in 1920 have been reduced to 500 ft. In other words, 6,000 ft. of bridges have been rebuilt with steel or concrete structures and creosoted pine.

The directors are unwilling to curtail the budget expenditures planned for this year and desire even to improve maintenance, in the belief that a superior service will attract additional business. The management is charged with the task of making certain curtailments in operating expenses and of making additional efforts to obtain new business. In common with other railway operations the Texas Electric

has suffered from private automobile competition and to some extent from bus competition, although indirectly, since there is no paralleling operations on the property except for 32 miles between McKinney and Dallas.

It is the belief, in short, that this plan will prove to be the best in the long run and that future net earnings will allow the reestablishment of the preferred stocks on the dividend basis. The improvement in physical property is expected to reduce operating expenses and better the service. More extensive advertising should improve the gross revenue.

A digest of the report of the company for 1925 was published in the **JOURNAL** for March 27, page 568.

Net Income for 1925 Shows Improvement

Details of Operation from Railways Representing 90 per Cent of Earning Capacity of Industry—Slight Decrease in Traffic Offset by Lower Operating Costs and Increased Efficiency—Operating Ratio Slightly Lower than in 1924

IMPROVEMENT was shown in the financial condition of the electric railways as a whole in 1925 compared with 1924. There was a small decrease in the volume of traffic handled and in consequence a corresponding decrease in the gross revenues, but lower operating costs offset these adverse factors and produced an increase in the net

Slight Gain in Net in Minneapolis

The first full quarter report since the Minneapolis Street Railway, Minneapolis, Minn., has operated under the advanced fare of 8 cents cash and six tokens for 40 cents permitted by the Minnesota Railroad and Warehouse Commission, instead of 6 cents flat, shows net of \$291,250. This is a gain of \$3,929 over the first quarter of 1925. Compared with the net for 1924, when the figure for the first quarter was \$246,187, the gain is \$45,063. Operating revenue gain of \$88,189 for the quarter this year was offset by an increase of \$78,116 in operating expenses over 1925. The operating revenues respectively were \$2,133,857 and \$2,045,668 and expenses \$1,416,622 and \$1,338,506. Tax levies reduced the income by \$208,423 to \$508,812. Interest and miscellaneous charges were \$231,997. The income from rentals and non-operating sources was \$14,325.

His summary of the net results of operations in 1925 is based on the reports of a group of companies representing approximately 90 per cent of the earning power of the industry. Altogether 327 companies reported and the accompanying tables give briefly the most significant facts in connection with their operations.

COMBINED OPERATIONS OF 327 COMPANIES

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.....	\$832,506,416	\$835,085,489	(D) \$2,579,073	(D) 0.31
Railway operating expense.....	610,752,671	617,065,623	(D) 6,312,952	(D) 1.02
Net operating revenue.....	\$221,753,745	\$218,019,866	\$3,733,879	1.71
Operating ratio, per cent.....	73.36	73.89	(D) 0.53	(D) 0.72
Miles of track.....	31,189.59	31,284.96	(D) 95.37	(D) 0.31
Revenue passengers.....	11,569,799,316	11,705,440,140	(D) 135,640,824	(D) 1.16
Total passengers.....	14,511,690,825	14,627,347,649	(D) 115,656,824	(D) 0.80
Car-miles, revenue.....	1,971,496,333	1,962,126,053	(D) 9,370,280	0.48

revenue in the larger cities. The interurbans and smaller companies are still reporting unfavorable results. While the gains that have been made by the industry as a whole are encouraging, conditions are still far from satisfactory.

The reduction in operating expenses was brought about by lower material costs and by more efficient operation, particularly in the use of labor. The cost of labor continued comparatively stable, the average wages at the end of the year being only slightly more than 1 per cent above the average at the end of 1924. The slight decrease in traffic was caused by the continued increase in the use of the private automobile and by subnormal industrial conditions in certain sections of the country, particularly in New England and the northwestern states.

So writes Edmund J. Murphy, chief statistician of the American Electric Railway Association, in *Aera* for May.

The total number of passengers carried by this group of companies in 1925 was 14,511,690,825, a decrease of 0.80 per cent compared with 1924. Of these 11,569,799,316 were revenue passengers, a decrease of 1.16 per cent from 1924.

The total railway operating revenue of these companies in 1925 was \$832,506,416, a decrease of \$2,579,073, or 0.31 per cent. The operating expenses, however, decreased \$6,312,952, or 1.02 per cent. This more than offset the loss in revenue. There was an increase of \$3,733,879, or 1.71 per cent, therefore, in the net revenue from operations. The actual amount in 1925 was \$221,753,745, compared with \$218,019,866 in 1924. The operating ratio of the group dropped from 73.89 per cent to 73.36 per cent.

It will be noted that the decrease in operating revenue compared with 1924 was considerably less than the decrease in revenue passengers. The respective

amounts were 0.31 per cent and 1.16 per cent. This difference is due to a slightly higher average rate of fare in 1925. When total passengers are considered, however, the effect of the higher fare is offset to some extent by the increase in the number of transfer passengers.

BUS OPERATIONS

These figures include for the most part only railway operations. There were, however, 30 companies that included bus operations in their reports. These operations, therefore, are included in the above table. They are so insignificant in comparison with the totals for the railways, however, that their effect is practically negligible.

In order to picture the total operations of all kinds of electric railways the accompanying table was prepared in which the bus operations of 66 companies controlled or operated by electric railways have been added to the railway operations. This table then includes 327 railway companies and 96 bus undertakings controlled by electric railways.

tional buses. All of this added substantially to the passenger traffic and the gross revenues. On the other hand nearly all of the bus lines are operating at a loss and when they are averaged in with the railways the effect is to increase expenses and raise the operating ratio of the group. Their total effect on the railway figures, however, is less than one-half of 1 per cent. In spite of the fact that bus operations are increasing by leaps and bounds, they only reduce the decrease in passenger traffic from 0.80 per cent for the railways alone to 0.53 per cent for the combined group.

In the scheme of analysis the whole group of 221 companies is first considered. The group of companies is then classified into city companies, interurban companies and combination companies operating both city and interurban lines.

Finally each of the three classes of companies is further subdivided into three smaller groups according to the sizes of the companies as follows: "A" companies, having gross railway reve-

of 221 companies follow very closely those of the larger group of 327 companies. The differences are in favor of the larger group, due to the inclusion of several metropolitan companies omitted in the smaller group. Thus revenue and total passengers decreased 2.87 per cent and 2.33 per cent respectively for this group of 221 companies and operating revenues were down 1.15 per cent. The effect of a higher average fare and a more liberal use of transfers is noticeable in these figures as they were in the figures of the 327 company group.

Something of an offset to these unfavorable comparisons is furnished by the operating expenses of the smaller group, which were 1.62 per cent lower, a substantially greater decrease than that recorded by the larger group. The operating ratio, however, is somewhat higher, although it dropped from 75.13 in 1924 to 74.78 in 1925. Net revenue was up 0.25 per cent.

Taxes as usual increased, the amount being \$242,244, or 0.69 per cent. This was offset by an increase of \$359,764 in the net revenue from auxiliary operations, the increase amounting to 10.05 per cent over 1924. An increase of \$918,158, or 11.08 per cent, in non-operating income helped at this point and produced a gross income of \$116,090,794, compared with \$114,602,722 in 1924, an increase of \$1,488,072, or 1.30 per cent. Deductions from income or fixed charges were \$95,034,960, a decrease of \$937,079 from 1924, or 0.98 per cent. Net corporate income was \$21,055,834, compared with a net income of \$18,630,683 in 1924. The increase was \$2,425,151, or 13.02 per cent.

The average cost of operation per car-mile of this group of companies was 33.50 cents in 1925, compared with 33.79 cents in 1924. The decrease can be traced to the power and maintenance

COMBINED OPERATIONS OF 327 RAILWAY COMPANIES AND 96 CONTROLLED BUS UNDERTAKINGS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Operating revenue.....	\$840,395,490	\$838,904,506	\$1,490,984	0.18
Operating expense.....	618,757,782	620,743,272	(D) 1,985,490	(D) 0.32
Net operating revenue.....	\$221,637,708	\$218,161,234	\$3,476,474	1.59
Operating ratio, per cent.....	73.63	73.99	(D) 0.36	(D) 0.49
Revenue passengers.....	11,632,868,986	11,734,410,535	(D) 101,541,549	(D) 0.87
Total passengers.....	14,583,367,813	14,660,991,440	77,623,627	(D) 0.53
Car- and bus-miles, revenue.....	2,003,400,393	1,977,825,691	25,574,702	1.29

With the bus figures added the gross revenues are increased and net revenues decreased. Some of the bus lines were not in operation in 1924, and many of those that were added new lines during the year and put on addi-

nues of \$1,000,000 or more per year; "B" companies, having annual revenues of from \$250,000 to \$1,000,000, and "C" companies, having annual revenues of less than \$250,000.

The operations of the combined group

Statistics Compiled by American Electric Railway Association

Part I—Combined Operating Reports of 221 Electric Railways for the Calendar Year 1925 Compared with 1924

TABLE I—COMBINED INCOME STATEMENT

	1925	1924	—Increase or Decrease (D)—		Cents per Car-Mile		
			Total	Per Cent	1925	1924	Per Cent Increase
Railway operating revenue.....	\$546,259,829	\$552,622,641	(D) \$6,362,812	(D) 1.15	44.80	44.98	(D) 0.40
Railway operating expense.....	408,485,147	415,187,030	(D) 6,701,883	(D) 1.62	33.50	33.79	(D) 0.86
Net operating revenue.....	\$137,774,682	\$137,435,611	339,071	0.25	11.30	11.19	0.98
Net revenue: Auxiliary operations.....	3,937,800	3,578,036	359,764	10.05	0.32	0.29	10.34
Taxes.....	34,997,018	34,754,774	242,244	0.69	2.87	2.83	1.41
Operating income.....	\$106,715,464	\$106,258,873	456,591	0.43	8.75	8.64	1.27
Non-operating income.....	9,203,127	8,284,969	918,158	11.08	0.75	0.67	11.94
Gross income.....	a \$116,090,794	b \$114,602,722	1,488,072	1.30	9.52	9.33	2.04
Deductions from gross income.....	95,034,960	95,972,038	(D) 937,079	(D) 0.98	7.79	7.81	(D) 0.26
Net income.....	\$21,055,834	\$18,630,683	\$2,425,151	13.02	1.72	1.52	13.15
Operating ratio (per cent).....	74.78	75.13	(D) 0.35	(D) 0.47	.....	.....	.....
Ratio: Net income to operating revenue..	3.85	3.37	0.48	14.24	.....	.....	.....

a Includes \$172,203 equalization income. b Includes \$58,880 equalization income.

TABLE II—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	—Increase or Decrease (D)—		Cents per Car-Mile		
			Total	Per Cent	1925	1924	Per Cent Increase
Way and structures.....	\$60,833,182	\$61,246,911	(D) \$412,729	(D) 0.68	4.98	4.98	.....
Equipment.....	52,375,494	54,799,849	(D) 2,424,355	(D) 4.43	4.29	4.46	(D) 3.81
Power.....	56,022,802	59,212,509	(D) 3,189,707	(D) 5.39	4.59	4.82	(D) 4.77
Conducting transportation.....	176,451,629	178,656,502	(D) 2,204,873	(D) 1.24	14.47	14.54	(D) 0.48
Traffic.....	2,144,047	1,756,542	387,505	22.06	0.17	0.14	21.43
General and miscellaneous.....	57,796,246	57,040,465	755,781	1.32	4.74	4.64	2.15
Transportation for investment—Cr.....	—387,460	—340,982	46,478	13.63	0.03	0.02	50.00
Total operating expenses.....	a \$408,485,147	b \$415,187,030	(D) \$6,701,883	(D) 1.62	c 33.50	d 33.79	(D) 0.76

a Includes \$3,249,207 undistributed expense. c Includes 0.27 cent of undistributed expense.
b Includes \$2,815,234 undistributed expense. d Includes 0.22 cent of undistributed expense.

of equipment accounts and, to a lesser degree, to the conducting transportation account. This latter account came to 14.47 cents per car-mile in 1925, compared with 14.54 cents in 1924. There was no decrease in wages in 1925; the average wage was in fact somewhat more than 1 per cent higher than in 1924. The decrease in the cost per car-mile, therefore, must be credited to a more efficient use of man-hours, and it is a very encouraging sign of progress.

Another indication that the companies are more alert and efficient in the management of their properties is found in the reduction in the number of car-miles run to conform with the reduced traffic.

Total revenue car-miles were reduced only 9,395,707. This indicates an increase in the mileage run in other than passenger service. This is undoubtedly due to the increased freight service which electric railways are known to be developing. The increase in non-passenger mileage is confined almost entirely to the interurban and combination city and interurban lines, with the straight interurban lines furnishing the greater part of it.

CLASSES OF COMPANIES COMPARED

When the group of companies is separated into its three classes it is found that all of the favorable factors were furnished by the city companies. The combination companies might be said to have about held their ground but the interurbans had to give way somewhat. The number of revenue passengers, for instance, decreased 2.55

per cent on the city lines, 3.81 per cent on the combination lines and 8.63 per cent on the interurban lines. Again, the operating revenue actually increased 0.22 per cent on the city lines, it decreased 3.96 per cent on the combination lines and it decreased 5.13 per cent on the interurbans. There is evidence, however, that the interurbans increased their freight revenue. Thus, while their passenger revenue decreased 7.98 per cent, their total operating revenue decreased only 5.13 per cent. This is also true of the combination lines. Their total revenues decreased only 3.96 per cent, while their passenger revenue alone was decreasing 4.98 per cent.

In the reduction of operating expenses, too, the interurbans made the best showing. They reduced their cost per car-mile 2.69 per cent, compared with a reduction of 0.72 per cent for the city lines and 0.83 per cent for the combination lines.

The greatest reduction was effected by the interurbans in the maintenance of equipment account, 6.94 per cent, while the city companies made their greatest reduction in their power cost, 5.53 per cent. The combination companies effected the greatest reduction

of expenses in their maintenance of way and structures, 3.05 per cent per car-mile, as against 2.71 per cent in their power. The interurbans also reduced their maintenance of way expense per car-mile 4.42 per cent, their power cost 6.70 per cent and their conducting transportation expense 0.08 per cent. The combination companies reduced their maintenance of equipment cost 1.17 per cent and their conducting transportation cost 2.66 per cent per car-mile. It is interesting to note in this connection that the only expense other than power that the city companies reduced was their maintenance of equipment, which decreased 4.45 per cent per car-mile. Their cost of conducting transportation increased 0.20 per cent and their maintenance of way 2.19 per cent per car-mile. Of still greater interest, perhaps, is the general increase in the amounts spent for the promotion of traffic by all types of com-

Part II—City Lines—Combined Reports of 96 Companies Operating City Lines Exclusively

TABLE V—COMBINED INCOME STATEMENT

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.....	\$378,513,379	\$377,665,237	\$848,142	0.22
Railway operating expense.....	277,743,129	280,246,398	(D) 2,503,269	(D) 0.89
Net operating revenue.....	\$100,770,250	\$97,418,839	\$3,351,411	3.44
Net revenue: Auxiliary operations.....	662,528	668,527	(D) 5,999	(D) 0.90
Taxes.....	24,672,566	24,243,958	428,608	1.76
Operating income.....	\$76,760,212	\$73,843,408	\$2,916,804	3.95
Non-operating income.....	5,212,242	4,605,458	606,784	13.17
Gross income.....	\$82,144,657	\$78,507,746	\$3,636,911	4.63
Deductions from gross income.....	63,751,223	62,685,675	1,065,548	1.70
Net income.....	\$18,393,434	\$15,822,071	\$2,571,363	16.25
Operating ratio, per cent.....	73.38	74.20	(D) 0.82	(D) 1.11
Ratio: Net income to operating revenue....	4.86	4.18	0.68	16.26

a Includes \$172,203 equalization income.

b Includes \$58,880 equalization income.

TABLE III—OPERATING STATISTICS—221 COMPANIES

	1925	1924	Increase or Decrease (D) Total	(D) Per Cent
Passenger car-miles....	1,182,404,436	1,193,154,462	(D) 10,750,026	(D) 0.91
Total revenue car-miles....	1,219,236,302	1,228,632,009	(D) 9,395,707	(D) 0.77
Revenue passengers ¹	6,953,544,580	7,158,932,196	(D) 205,387,616	(D) 2.87
Transfer passengers ²	1,726,122,971	1,723,682,296	2,440,675	0.14
Total passengers ³	8,749,708,711	8,958,005,506	(D) 208,296,795	(D) 2.33
Passenger revenue.....	\$508,882,806	\$516,068,823	(D) \$7,186,017	(D) 1.39
Revenue car-hours ⁴	110,713,726	111,799,884	(D) 1,086,158	(D) 0.97
Passenger car-hours ⁴	109,536,800	110,626,930	(D) 1,090,130	(D) 0.99
Miles of single track.....	23,484.91	23,576.23	(D) 91.32	(D) 0.39
Passenger cars operated ⁴ a	26,816	26,815	.....	.....

a Average maximum number of passenger cars in service daily.

¹ Reported by 218 companies.

² Reported by 150 companies.

³ Reported by 189 companies.

⁴ Reported by 176 companies.

TABLE IV—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES—221 COMPANIES

	1925	1924	Per Cent Increase or (D) Decrease
Railway operating revenue.....	\$546,259,829	\$552,622,641	(D) 1.15
Per mile of single track.....	23,260	23,440	(D) 0.77
Gross income.....	\$116,090,794	\$114,602,722	1.30
Per mile of single track.....	\$4,941	\$4,861	1.65
Passenger revenue.....	\$508,882,806	\$516,068,823	(D) 1.39
Per revenue passenger.....	\$7.1c.	\$7.0c.	1.43
Per total passenger.....	15.7c.	15.7c.	.....
Per mile of single track.....	\$21.668	\$21.889	(D) 1.01
Per passenger car-miles.....	43.0c.	43.3c.	(D) 0.69
Per car operated.....	\$16.302	\$16.542	(D) 1.45
Per passenger car-hour.....	\$4.07	\$4.08	(D) 0.25
Revenue passengers.....	16,953,544,580	17,158,932,196	(D) 2.87
Per mile of single track.....	1307,463	1315,451	(D) 2.53
Per passenger car-mile.....	16.0	16.1	(D) 1.64
Per car operated.....	\$226.859	\$234.314	(D) 3.18
Per passenger car-hour.....	\$59	\$60	(D) 1.67
Total passengers.....	18,749,708,711	18,958,005,506	(D) 2.33
Per mile of single track.....	1386.884	1394.725	(D) 1.99
Per passenger car-mile.....	17.6	17.7	(D) 1.30
Ratio: Transfer passengers to revenue passengers (per cent).....	24.8%	24.1%	2.90
Revenue car-miles.....	1,219,236,302	1,228,632,009	(D) 0.76
Per mile of single track.....	\$1,915	\$2,315	(D) 0.76
Per car operated.....	\$38.914	\$39.390	(D) 1.21
Per car-hour.....	\$9.31	\$9.29	0.22
Car-hours.....	\$110,713,726	\$111,799,884	(D) 0.97
Per car operated.....	64,090	64,145	(D) 1.33

¹ 218 companies. ² 176 companies. ³ 189 companies. ⁴ 174 companies. ⁵ 186 companies. ⁶ 158 companies.

TABLE VI—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures....	\$38,990,710	\$38,212,613	\$778,097	2.04
Equipment.....	35,969,086	37,719,579	(D) 1,750,493	(D) 4.64
Power.....	35,803,713	37,850,683	(D) 2,046,970	(D) 5.41
Conducting transportation.....	127,595,136	127,587,195	7,941	0.01
Traffic.....	799,015	629,635	169,380	26.90
General and miscellaneous.....	36,533,840	36,126,295	407,545	1.13
Transportation for investment—Cr.....	—116,607	—131,339	(D) 14,732	(D) 11.22
Total operating expense.....	\$277,743,129	\$280,246,398	(D) \$2,503,269	(D) 0.89

a Includes \$2,168,236 undistributed expense.

b Includes \$2,251,737 undistributed expense.

TABLE VII—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	832,545,696	834,024,876	(D) 1,479,180	(D) 0.18
Total revenue car-miles.....	836,591,328	838,047,485	(D) 1,456,157	(D) 0.17
Revenue passengers.....	5,424,784,581	5,566,644,528	(D) 141,859,947	(D) 2.55
Transfer passengers ¹	1,577,724,303	1,563,418,639	14,305,664	0.91
Total passengers.....	7,041,296,156	7,170,501,884	(D) 129,205,728	(D) 1.80
Passenger revenue.....	\$369,248,085	\$368,618,666	\$629,419	0.17
Revenue car-hours ²	81,572,794	81,794,120	(D) 221,326	(D) 0.27
Passenger car-hours ²	81,369,105	81,580,791	(D) 211,686	(D) 0.26
Miles of single track.....	10,508.29	10,536.41	(D) 28.12	(D) 0.27
Passenger cars operated ³ a.....	20,024	19,883	141	0.71

a Average maximum number of passenger cars in service daily. ¹ Reported by 79 companies. ² Reported by 87 companies. ³ Reported by 83 companies.

panies. The total amount spent by the three groups was \$2,144,047, an increase of \$387,505 over 1924. The increase for the city companies was 26.90 per cent, for the interurbans 19.40 per cent and for the combination companies 19.34 per cent. This would seem to indicate that all companies were paying more attention to advertising and the development of new business generally.

In spite of the very substantial reduction in the operating expenses of the interurban companies the operating ratio of the group rose from 83.75 to 84.61 per cent. This, of course, was due to the decrease in traffic and revenue which was greater than the decrease in expenses. The city lines having both an increase in revenue and a decrease in expenses, their operating ratio dropped from 74.20 to 73.38 per cent, the lowest ratio of the three

groups. The change in the combination lines was, as it naturally would be, midway between the other two, their operating ratio rising slightly from 76.08 per cent to 76.90 per cent.

TAXES ON CITY LINES INCREASED

The taxes of the city lines increased 1.76 per cent, but those of the two other groups declined, 6.50 per cent in the case of the interurbans and 1.14 per cent in the case of the combination companies.

Fixed charges followed the same course among the groups. There was an increase of 1.70 per cent for the city companies and decreases of 1.14 per cent and 7 per cent respectively for the interurban and combination companies.

These minor advantages of these two groups did not, however, begin to equal the initial advantage in the net results

from operations enjoyed by the city lines. Consequently while the net income of the city lines registered a substantial increase, that of the two other groups fell off slightly. The net corporate income of the city lines amounted to \$18,393,434, an increase of \$2,571,363, or 16.25 per cent, over 1924.

The interurban lines closed the year with a deficit of \$1,270,856, which was an increase of \$126,702 compared with 1924. The net income of the combination lines amounted to \$3,933,256, a decrease of \$19,510, or 0.49 per cent, under 1924.

It is of more than passing interest to note in connection with the above figures that the interurban group was the only one of the three to show an increase in track mileage. The increase was only 10.58 miles, but it compares

Part III—Interurban Lines—Combined Reports of 49 Companies Operating Interurban Lines Exclusively

TABLE VIII—INCOME STATEMENT OF 49 ELECTRIC RAILWAYS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.....	\$22,669,875	\$23,896,461	(D) \$1,226,586	(D) 5.13
Railway operating expense.....	19,181,568	20,013,193	(D) 831,625	(D) 4.16
Net operating revenue.....	\$3,488,307	\$3,883,268	(D) \$394,961	(D) 10.17
Net revenue: Auxiliary operations.....	1,568,608	1,401,166	167,442	11.95
Taxes.....	1,171,137	1,252,498	(D) 81,361	(D) 6.50
Operating income.....	\$3,885,778	\$4,031,936	(D) \$146,158	(D) 3.63
Non-operating income.....	349,530	393,364	(D) 43,834	(D) 11.14
Gross income.....	\$4,235,308	\$4,425,300	(D) \$189,992	(D) 4.29
Deductions from gross income.....	5,506,164	5,569,454	(D) 63,290	(D) 1.14
Net income.....	*\$1,270,856	*\$1,144,154	*\$126,702	.....
Operating ratio, per cent	84.61	83.75	0.86	1.03
Ratio: Net income to operating revenue...	.....	.....	.....	.....

*Deficit.

TABLE IX—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures....	\$3,716,154	\$3,949,402	(D) \$233,248	(D) 5.91
Equipment.....	2,309,722	2,516,528	(D) 206,806	(D) 8.22
Power.....	3,392,689	3,690,545	(D) 297,856	(D) 8.07
Conducting transportation.....	5,986,621	6,083,884	(D) 97,263	(D) 1.60
Traffic.....	351,748	294,580	57,168	19.40
General and miscellaneous.....	3,437,820	3,485,661	(D) 47,841	(D) 1.37
Transportation for investment—Cr.....	—14,273	—10,191	4,082	40.05
Total operating expense.....	a \$19,181,568	b \$20,013,193	(D) \$831,625	(D) 4.16

a Includes \$1,087 undistributed expense.
b Includes \$2,784 undistributed expense.

TABLE X—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	38,010,213	39,494,142	(D) 1,483,929	(D) 3.76
Total revenue car-miles	47,762,458	48,490,250	(D) 727,792	(D) 1.50
Revenue passengers ¹ ...	54,653,444	59,815,956	(D) 5,162,512	(D) 8.63
Transfer passengers ² ...	1,086,556	1,150,161	(D) 63,605	(D) 5.53
Total passengers ³ ...	57,385,061	62,586,043	(D) 5,200,982	(D) 8.31
Passenger revenue.....	\$14,305,650	\$15,545,349	(D) \$1,239,699	(D) 7.98
Revenue car-hours ⁴ ...	1,768,776	1,824,661	(D) 55,885	(D) 3.06
Passenger car-hours ⁴ ...	1,400,904	1,469,075	(D) 68,171	(D) 4.64
Miles of single track....	3,027.87	3,017.29	10.58	0.35
Passenger cars operated ⁴ a.....	473	468	5	1.06

a Average maximum number of passenger cars in service daily. ¹ Reported by 48 companies. ² Reported by 12 companies. ³ Reported by 35 companies. ⁴ Reported by 36 companies.

Part IV—City and Interurban Lines—Combined Reports of 76 Companies Operating Combined City and Interurban Lines

TABLE XI—INCOME STATEMENT

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Railway operating revenue.....	\$145,076,575	\$151,060,945	(D) \$5,984,368	(D) 3.96
Railway operating expense.....	111,560,450	114,927,439	(D) 3,366,989	(D) 2.93
Net operating revenue.....	\$33,516,125	\$36,133,504	(D) \$2,617,379	(D) 7.24
Net revenue: Auxiliary operations.....	1,706,664	1,508,343	198,321	13.15
Taxes.....	9,153,315	9,258,318	(D) 105,003	(D) 1.14
Operating income.....	\$26,069,474	\$28,383,529	(D) \$2,314,055	(D) 8.15
Non-operating income.....	3,641,355	3,286,147	355,208	10.81
Gross income.....	\$29,710,829	\$31,669,676	(D) \$1,958,847	(D) 6.19
Deductions from gross income.....	25,777,573	27,716,910	(D) 1,939,337	(D) 7.00
Net income.....	\$3,933,256	\$3,952,766	(D) \$19,510	(D) 0.49
Operating ratio, per cent	76.90	76.08	0.82	1.08
Ratio: Net income to operating revenue...	2.71	2.62	0.09	3.43

TABLE XII—OPERATING EXPENSES BY PRIMARY ACCOUNTS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Way and structures....	\$18,126,318	\$19,084,896	(D) \$958,578	(D) 5.02
Equipment.....	14,096,686	14,563,742	(D) 467,056	(D) 3.21
Power.....	16,826,400	17,671,281	(D) 844,881	(D) 4.78
Conducting transportation.....	42,869,872	44,985,423	(D) 2,115,551	(D) 4.70
Traffic.....	993,284	832,327	160,957	19.34
General and miscellaneous.....	17,824,586	17,428,509	396,077	2.27
Transportation for investment—Cr.....	—256,580	—199,452	57,128	28.64
Total operating expense.....	a \$111,560,450	b \$114,927,439	(D) \$3,366,989	(D) 2.93

a Includes \$1,079,884 undistributed expense.
b Includes \$560,713 undistributed expense.

TABLE XIII—OPERATING STATISTICS

	1925	1924	Increase or (D) Decrease	Per Cent Increase or (D) Decrease
Passenger car-miles....	311,848,527	319,635,444	(D) 7,786,917	(D) 2.44
Total revenue car-miles	334,882,516	342,094,274	(D) 7,211,758	(D) 2.11
Revenue passengers ¹ ...	1,474,106,555	1,532,471,712	(D) 58,365,157	(D) 3.81
Transfer passengers ² ...	147,312,112	159,113,496	(D) 11,801,384	(D) 7.42
Total passengers ³ ...	1,651,027,494	1,724,917,579	(D) 73,890,085	(D) 4.28
Passenger revenue.....	\$125,329,071	\$131,904,808	(D) 6,575,737	(D) 4.98
Revenue car-hours ⁴ ...	27,372,156	28,181,103	(D) 808,947	(D) 2.87
Passenger car-hours ⁴ ...	26,766,791	27,577,064	(D) 810,273	(D) 2.94
Miles of single track....	9,948.75	10,022.53	(D) 73.78	(D) 0.74
Passenger cars operated ⁴ a.....	6,319	6,464	(D) 145	(D) 2.24

a Average maximum number of passenger cars in service daily. ¹ Reported by 74 companies. ² Reported by 59 companies. ³ Reported by 67 companies. ⁴ Reported by 57 companies.

Part V—Combined Statements of All Three Types of Companies on a Car-Mile Basis

TABLE XIV—INCOME STATEMENT OF 96 CITY COMPANIES, 49 INTERURBAN COMPANIES AND 76 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

Table with columns for City Lines, Interurban Lines, and City and Interurban Lines. Rows include Railway operating revenue, Railway operating expense, Net operating revenue, and Net income.

TABLE XV—OPERATING EXPENSES OF 96 CITY COMPANIES, 49 INTERURBAN COMPANIES AND 76 COMPANIES OPERATING COMBINED CITY AND INTERURBAN LINES

Table with columns for City Lines, Interurban Lines, and City and Interurban Lines. Rows include Way and structures, Equipment, Power, Conducting transportation, Traffic, General and miscellaneous, and Transportation for investment.

they had made radical and successful changes in their financial structures. They also increased their track mileage by 13.72 miles.

The large city companies are of course in the strongest position. They reduced their operating ratio from 73.81 per cent to 73.07 per cent and increased their net corporate income by \$1,679,682, or 10.27 per cent.

STATUS OF SMALL CITY COMPANIES UNCHANGED

The city companies earning less than \$250,000 a year did not change their condition materially during the year. They had a deficit of \$117,320 in 1924. This increased to \$161,214 in 1925. Their operating ratio remained unchanged at 86.23 per cent in both years.

In the interurban group the large companies reduced their operating ratio from 83.76 to 83.57 and a deficit of \$56,826 in 1924 to one of \$2,812 in 1925. The medium and small sized companies, however, failed to show any improvement. Both these groups returned increased deficits and higher operating ratios. Loss of traffic was the source of their troubles.

Pretty much the same conditions prevailed among the combination companies. The large companies in this group earned a net income of \$5,606,933, a decrease of \$159,967, or 2.77 per cent. The operating ratio rose from 74.72 per cent to 75.65 per cent. The small companies reported an increased deficit and a higher operating ratio, but the medium-sized companies reduced a deficit of \$1,525,726 in 1924 to \$1,345,524 in 1925.

In the analysis of the income statement as compiled by the association and contained in Part VII of that record detailed figures were given of the income statements of the various groups, of the operating expenses by primary accounts and of the operating statistics.

with a decrease of 28.12 miles for the city lines and 73.78 miles for the combination group.

in 1925. They changed a deficit of \$416,505 in 1924 into a net corporate income of \$519,070, a net change of \$935,575. Their operating ratio was reduced from 82.33 per cent to 79.15 per cent. The sources of this improvement are found principally in a substantial reduction in operating expenses and in a really remarkable reduction of 21.01 per cent in their fixed charges. They saved a total of \$451,403 by this reduction, which would indicate that

FURTHER ANALYSIS

The most striking point that is brought out where the groups of companies are further subdivided according to the sizes of the companies is that the medium-sized city companies, those earning from \$250,000 to \$1,000,000 a year, made the greatest improvement

Part VI—Derived Ratios

TABLE XVI—SIGNIFICANT RATIOS DERIVED FROM THE FOREGOING TABLES

Large table with columns for 96 City Companies, 49 Interurban Companies, and 76 Companies Operating Both City and Interurban Lines. Rows include Railway operating revenue, Gross income, Passenger revenue, Revenue passengers, Total passengers, Ratio: Transfer to revenue passengers, Revenue car-miles, and Car-hours.

148 companies, 274 companies, 383 companies, 436 companies, 657 companies, 687 companies, 735 companies, 667 companies, 955 companies, 1034 companies, 165 companies, 1276 companies, 1829 companies, 1453 companies.

Part VII—Analysis of Income Statement

TABLE XVII—ANALYSIS OF OPERATING STATEMENT—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
	44 Cos. With Revenues of More Than \$1,000,000 per Year Each	25 Cos. With Revenues of \$250,000 to \$1,000,000 per Year Each	27 Cos. With Revenues of Less Than \$250,000 per Year Each	6 Cos. With Revenues of More Than \$1,000,000 per Year Each	23 Cos. With Revenues of \$250,000 to \$1,000,000 per Year Each	20 Cos. With Revenues of Less Than \$250,000 per Year Each	26 Cos. With Revenues of More Than \$1,000,000 per Year Each	28 Cos. With Revenues of \$250,000 to \$1,000,000 per Year Each	22 Cos. With Revenues of Less Than \$250,000 per Year Each
Railway operating revenue.....	0.26	0.02	(D) 3.12	(D) 5.13	(D) 3.19	(D) 14.66	(D) 3.60	(D) 5.58	(D) 10.60
Railway operating expense.....	(D) 0.75	(D) 3.85	(D) 3.12	(D) 5.34	(D) 1.38	(D) 12.65	(D) 2.39	(D) 5.52	(D) 8.36
Net operating revenue.....	3.09	18.03	(D) 3.10	(D) 4.01	(D) 11.91	(D) 30.05	(D) 7.17	(D) 5.91	(D) 36.73
Net revenue: Auxiliary operations	1.39	(D) 7.49	(D) 63.07	13.15	(D) 11.47	(D) 3.42	11.63	30.20	437.27
Taxes.....	2.08	(D) 6.43	3.90	(D) 7.42	(D) 4.41	(D) 12.62	(D) 1.02	(D) 0.43	(D) 14.18
Operating income.....	3.41	29.47	(D) 8.76	6.23	(D) 15.08	(D) 47.44	(D) 8.06	(D) 7.26	(D) 56.38
Non-operating income.....	14.18	0.23	(D) 46.93	(D) 1.66	(D) 29.94	(D) 23.21	13.99	(D) 5.15	(D) 25.47
Gross income.....	4.18	27.96	(D) 16.28	5.46	(D) 16.13	(D) 44.00	(D) 5.94	(D) 6.88	(D) 47.20
Deductions from gross income.....	2.52	(D) 21.01	(D) 0.52	3.34	(D) 6.82	2.84	(D) 6.73	(D) 8.73	(D) 5.20
Net income.....	10.27						(D) 2.77		
Operating ratio (per cent).....	(D) 1.01	(D) 3.86		(D) 0.23	1.87	2.36	1.24	0.07	2.51
Ratio: Net income to operating revenue.....	9.93						0.90		

TABLE XVIII—OPERATING EXPENSES BY PRIMARY ACCOUNTS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Way and structures.....	2.73	(D) 13.83	(D) 3.96	(D) 6.39	(D) 4.81	(D) 9.00	(D) 3.47	(D) 13.18	(D) 8.28
Equipment.....	(D) 4.57	(D) 5.87	(D) 6.56	(D) 11.19	(D) 5.55	(D) 8.21	(D) 3.48	(D) 1.05	(D) 5.68
Power.....	(D) 6.04	6.62	(D) 1.36	(D) 4.53	(D) 4.06	(D) 33.57	(D) 4.59	(D) 4.67	(D) 11.33
Conducting transportation.....	0.22	(D) 5.24	(D) 2.57	(D) 3.81	2.02	(D) 7.76	(D) 4.57	(D) 5.14	(D) 8.03
Traffic.....	32.09	(D) 14.06	(D) 55.31	24.20	9.02	68.15	19.37	23.18	(D) 10.29
General and miscellaneous.....	1.21	(D) 0.72	3.11	(D) 5.56	1.95	(D) 6.11	3.19	(D) 1.72	(D) 6.84
Transportation for investment—Cr.....	(D) 11.27	81.94		(D) 34.33	58.40		10.72		58.33
Total operating expense.....	(D) 0.75	(D) 3.85	(D) 3.12	(D) 5.34	(D) 1.38	(D) 12.65	(D) 2.39	(D) 5.52	(D) 8.36

TABLE XIX—OPERATING STATISTICS—PER CENT INCREASE OR (D) DECREASE

	City Companies			Interurban Companies			Combined Properties		
Passenger car-miles.....	(D) 0.17	(D) 0.05	(D) 0.98	(D) 5.89	(D) 0.48	(D) 6.87	(D) 2.72	(D) 0.39	(D) 4.60
Total revenue car-miles.....	(D) 0.17	(D) 0.07	(D) 1.08	(D) 4.68	2.54	(D) 6.75	(D) 2.26	(D) 0.66	(D) 5.41
Revenue passengers.....	(D) 2.56	(D) 1.98	(D) 4.29	(D) 9.47 ⁹	(D) 5.82	(D) 13.45	(D) 3.23 ¹⁹	(D) 6.92	(D) 10.28
Transfer passengers.....	1.03 ¹	(D) 3.94 ⁴	(D) 8.71 ⁶	(D) 9.05 ¹⁰	(D) 2.98 ¹³	(D) 8.82 ¹⁶	(D) 8.04 ²⁰	(D) 2.16 ²²	(D) 11.35 ²⁴
Total passengers.....	(D) 1.76	(D) 2.19	(D) 5.11	(D) 9.13 ⁹	(D) 5.48	(D) 13.22	(D) 3.86 ¹⁹	(D) 6.52	(D) 10.43
Passenger revenue.....	0.23	(D) 0.84	(D) 2.98	(D) 9.31	(D) 6.31	(D) 9.58	(D) 4.72	(D) 5.84	(D) 12.37
Revenue car-hours.....	(D) 0.21 ²	(D) 0.92 ⁴	(D) 2.39 ⁷	(D) 4.33 ¹¹	(D) 0.44 ¹⁴	(D) 8.59 ¹⁷	(D) 2.74 ²⁰	(D) 2.92 ²²	(D) 6.94 ²⁵
Passenger car-hours.....	(D) 0.20 ²	(D) 0.92 ⁴	(D) 2.34 ⁷	(D) 4.20 ¹¹	(D) 3.22 ¹⁴	(D) 8.23 ¹⁷	(D) 2.82 ²⁰	(D) 2.94 ²²	(D) 6.99 ²⁵
Miles of single track.....	(D) 0.44	1.59	(D) 0.09	0.02	0.66	(D) 0.10	(D) 0.57	(D) 0.84	(D) 2.84
Passenger cars operated a.....	0.76 ⁴	(D) 0.23 ⁵	(D) 0.55 ⁸	4.31 ¹²	2.04 ¹⁵	(D) 10.34 ¹⁸	(D) 1.94 ²¹	(D) 4.09 ²³	(D) 7.83 ²⁸

a Average maximum number of passenger cars in service daily.

- ¹ Reported by 41 companies.
- ² Reported by 42 companies.
- ³ Reported by 35 companies.
- ⁴ Reported by 22 companies.
- ⁵ Reported by 23 companies.
- ⁶ Reported by 16 companies.
- ⁷ Reported by 23 companies.
- ⁸ Reported by 25 companies.
- ⁹ Reported by 5 companies.
- ¹⁰ Reported by 1 company.
- ¹¹ Reported by 2 companies.
- ¹² Reported by 3 companies.
- ¹³ Reported by 8 companies.
- ¹⁴ Reported by 16 companies.
- ¹⁵ Reported by 19 companies.
- ¹⁶ Reported by 3 companies.
- ¹⁷ Reported by 17 companies.
- ¹⁸ Reported by 14 companies.
- ¹⁹ Reported by 24 companies.
- ²⁰ Reported by 22 companies.
- ²¹ Reported by 19 companies.
- ²² Reported by 25 companies.
- ²³ Reported by 3 companies.
- ²⁴ Reported by 20 companies.
- ²⁵ Reported by 12 companies.
- ²⁶ Reported by 20 companies.
- ²⁷ Reported by 18 companies.

These are of considerable value as an extension of the accounts under the various groups of properties, but on account of space limitations it was decided not to show the totals or the amount of the increase or decrease, but merely the per cent of increase. This method of treatment has made it possible to combine into three tables a series of figures that, as carried out in full in the original compilation, cover 27 tables.

Connecticut Interurban Sold Under Foreclosure

The Hartford & Springfield Street Railway, Warehouse Point, Conn., at a sale held on April 27, passed into the hands of the protective committee of bondholders headed by Francis R. Cooley, Hartford, Conn. Mr. Cooley bid \$10,000 for the property, franchises and rolling stock of the company. No other bids were received. The sale was recorded as a personal one. The sale

was held to foreclose a mortgage of \$600,000 with interest amounting to \$260,000, making the total debt \$860,000.

Mr. Cooley accepted the property subject to a prior mortgage of \$161,000 on the Windsor Locks Traction Company property, taxes of \$72,000, receiver's certificates of \$125,000 and a reservation of \$25,000 for possible judgments against the company.

Terms of the plan under which the company will be reorganized have not been announced.

Deficit in Des Moines

For the year ended Dec. 31, 1925, the Des Moines City Railway, Des Moines, Iowa, reports a deficit of \$18,114 after the consideration of dividends on preferred stock. The net earnings were 2.70 times annual bond interest charges. The company operated under a service-at-cost franchise with fares increased on Oct. 1, 1925, to 10 cents cash, 9½-cent ticket, children 5 cents and school

children 2½ cents. The accompanying table gives the income account for last year.

INCOME ACCOUNT OF THE DES MOINES CITY RAILWAY FOR THE TWELVE MONTHS ENDED DEC. 31, 1925	
Revenue	
Passenger.....	\$2,248,092
Other.....	96,945
Total.....	\$2,345,037
Operating expenses and taxes	
Operating expenses.....	1,541,176
Taxes.....	152,000
Total.....	\$1,693,176
Net earnings.....	\$651,860
Deductions	
Interest on bonds.....	241,050
Other interest.....	83,531
Other charges.....	7,768
Total.....	\$332,350
Balance.....	\$319,510
Depreciation reserve.....	217,000
Balance.....	\$102,510
Dividends — Preferred stock.....	120,625
Deficit.....	\$18,114

Legal Notes

FEDERAL SUPREME COURT—*Steam Railroads Required to Establish Through Routes and Joint Rates and to Interchange Switching Service with Electric Railway*

Four steam railroads entering Michigan City, Ind., refused to establish through routes and joint rates and to interchange switching service with the Chicago, Lake Shore & South Bend Railway, an electric road also entering that city. After a hearing, the Interstate Commerce Commission directed the steam railroads to remove this discrimination which it termed unjust, and the present case was the result of a request by the steam railroads for an injunction, relieving them from complying with the order of the commission. Of the four steam railroads, only one had physical connection with the electric railway, but the court held this fact did not invalidate the order of the commission as to all four roads. The claims that the electric railroad would originate relatively little business, that its service was essentially dissimilar and other objections were overruled by the court, in view of the order of the commission, for whose judgment the court said it would not substitute its own. [Chicago, I. & L. Railway et al, vs. United States et al. 46 Supreme Court Rep., 226.]

ILLINOIS—*Court Will Reverse Issue of Certificate by Commission If Not Justified by Evidence*

In this case the Illinois Commerce Commission granted a certificate of convenience and necessity to a bus line for a route then being served by another bus company, which presented evidence to show that it was giving all of the service practicable for the traffic and there was not enough to justify the operation of two lines. The Supreme Court of Illinois accepted this view and declared the issue of the certificate void on the ground that the action of the Commission was unreasonable, arbitrary and confiscatory. [Superior Motor Bus Co. vs. Community Motor Bus Co., 150 Northeast. Rep., 668.]

INDIANA—*Carrier's Liability When Car Is Attacked by Highwaymen*

An interurban car was boarded by two highwaymen, who intimidated the crew and passengers and robbed the latter. One of the passengers brought suit against the company because of loss suffered and injuries received. The Supreme Court of Indiana, in reversing a judgment for the plaintiff declared a railroad is not an insurer of the safety of its passengers, as against the consequences of felonious acts done by persons not in its employ and over whom it has not control. The employees in charge of a train must afford passengers protection against such attacks when the employees have the means for such prevention or by the exercise of reasonable care could have provided themselves with the means or could have prevented the attack. In this

case, no such failure or refusal was shown. [Terre Haute I. & E. T. Co. vs. Scott, 150 Northeast. Rep., 777.]

KENTUCKY—*Duty of Person at an Interurban Crossing.*

The Kentucky law does not require a person crossing a railroad track in that state to stop, look and listen, but only to exercise the care of a reasonably prudent man under similar circumstances. [Bohmer's Adm'x vs. K. T. & T. Co., 279 Southwest. Rep., 955.]

MARYLAND—*Obligation to Maintain Bridge under Heavy Traffic.*

A railway company constructing its track over private right-of-way which crossed certain streets received permission from the city to construct a cut for its track provided it would build and "at all times thereafter" maintain a substantial bridge for one of the streets crossed, the bridge to be like a drawing which was made part of the permission granted. Such a bridge was built, but, after 16 years, traffic increased greatly and for this reason, and because it wished to lay water mains over the bridge, the city asked the railway to strengthen it. It was held that the railway was not obliged to do more than maintain a bridge of the light character originally constructed. [City of Baltimore vs. Washington, B. & A. Elec. Ry., 132 Atlantic Rep., 269.]

NEW JERSEY—*City Must Conform to Own Ordinance in Granting Bus License.*

A city had passed an ordinance which required applicants for bus licenses to file information on a number of points and declared that such licenses would be granted only when necessary or advisable in the interests of the public. Later, the city granted a license to an applicant who did not give all the information called for in the ordinance, and there was no determination as to the advisability or necessity of the line. In consequence, the Supreme Court of New Jersey set aside the license. [Bergen Bus Line vs. Hackensack Improvement Commission, 132 Atlantic Rep., 296.]

NEW JERSEY—*Injury to Lineman without Rubber Gloves.*

A lineman employed by a city to repair the fire alarm system attempted to clear wires after a storm without wearing rubber gloves, and was injured from excessive voltage from an electric power wire. His action was held to be contributory negligence. [Brice vs. Atlantic Coast E. R. Co. et al., 132 Atlantic Rep., 253.]

NEW YORK—*Railway Not Liable to Pass Rider When Carried Beyond Point to which Pass Was Good.*

The plaintiff was an employee of the city and had a pass permitting him to ride without charge between certain points on a trolley line crossing a bridge but freeing the company in case of accident. The car on which the plaintiff was riding escaped from con-

trol and he was injured, but not until the car had run past the point to which the pass was valid. The company was held not liable as the injured person had not become a passenger from whom fare was due. [Hester vs. Manhattan Bridge 3-Cent Line, 212 New York Supp., 292.]

NEW YORK—*Improper Questions of Plaintiff's Counsel Held to Require New Trial.*

A person injured in an accident with a trolley car received judgment in the trial court. In that trial the plaintiff's counsel asked the motorman if he was a "strike breaker" and other questions which were held to be prejudicial to the defendant, and a new trial was granted. [Romeo vs. United Traction Co., 212 New York Supp., 435.]

NEW YORK—*Railroad Failing to Begin Construction.*

The section in the railroad laws providing that the corporate existence of railroads failing to begin construction within five years after filing a certificate of incorporation shall cease, applies to surface street railways. [Hanbury vs. Metropolitan Securities Co., 213 New York Supp., 555.]

PENNSYLVANIA—*Duty of Pedestrian at Street Crossing.*

At a street crossing in a city, it is not contributory negligence for a pedestrian to cross the street while a car is approaching. He has a right to assume that the motorman will approach the intersection with due caution. [Murphy vs. P. R. T. Co., 132 Atlantic Rep., 194.]

WASHINGTON—*Bus Not Liable for Injury to Unlighted Truck.*

The driver of a truck who had continued driving after dark without lights and had stalled on a curve on the highway was held guilty of contributory negligence sufficient to prevent a recovery for injury to a fellow employee who was assisting him in the operation of the truck. [Martin vs. Puget Sound Elec. Ry., 241 Pacific Rep., 360.]

WASHINGTON—*Qualification of Rule That Company Is Not Responsible for Injury to Pedestrian Caused by Overhang of Car on a Curve*

In *Gannaway v. Puget Sound P., L. & T. Co.* (138 P., 267) it was held not to be the duty of street railway companies to warn pedestrians on the street that there is an overhang to an ordinary street car when it rounds a curve. In the present case, at a crossing which was protected by a traffic officer and signals, a pedestrian started to make the crossing at a time when the signals gave permission to do so. When half way across, the crossing signal was changed, and the pedestrian took what she thought was a safe position away from the car track, though in the middle of the street, but was struck by the overhang of the car, which was waiting at the corner and started to go around a curve at the signal of the traffic officer. In these circumstances, the court held that the question of the pedestrian's contributory negligence should have been submitted to a jury. [White et ux, vs. City of Seattle, 240 Pacific Rep., 903.]

Personal Items

J. D. Hallman Back in Service at Atlanta

J. D. Hallman, a pioneer in railway transportation in Atlanta, Ga., was named president of the Georgia Railway & Electric Company on April 19, succeeding Thomas K. Glenn, retiring head of the company, the properties of which are at present leased to the Georgia Railway & Power Company. Mr. Hallman is 84 years old.

Going to Atlanta soon after the war between the states, Mr. Hallman entered the mercantile business. When the first horse car line was established from the west end to the heart of the city he was an active backer of the enterprise. With the late Joel Hurt, he was one of the pioneer citizens who established the first electric line between Inman Park and Five Points. Mr. Hallman served for many years on the board of directors of the Georgia Railway & Power Company, but had been in retirement from active business life for several years.

At the same meeting James D. Robinson was elected vice-president of the Georgia Railway & Electric Company. Mr. Robinson is president of one of Atlanta's oldest and best-known business organizations, and is also vice-president and a director of the Fourth National Bank. For many years he has been a director of the Georgia Railway & Power Company.

W. H. Wright, secretary of the company, was elected a director to fill the place made vacant by the resignation of Mr. Glenn.

Changes in Capital Traction at Washington

H. D. Crampton, secretary and treasurer of the Capital Traction Company, Washington, D. C., has been elected a vice-president by the board of directors. Mr. Crampton will continue to serve as secretary and treasurer. He has been with the company for more than 30 years.

J. E. Heberle, who has been assistant secretary of the company for several years, has been made assistant to the president.

J. Fleming, purchasing agent, has been made assistant secretary, but will continue as purchasing agent.

Former Governor Heads West Virginia Interurban

W. A. MacCorkle, now the president of the Charleston Interurban Railroad, Charleston, W. Va., is a new figure in the electric railway field, although he has engaged in railroad building for many years. It was through his earnest efforts that the Coal River Railroad and the Elk River branch of the Baltimore & Ohio were built. In connection with his work in land development, bridge-building and railroad work he has published many books on these subjects.

By profession Mr. MacCorkle is a lawyer, and he has been active in public life. He was Governor of the state of West Virginia and state Senator and has served a number of commissions. In his capacity as president of the Charleston Interurban Railroad he succeeds the late F. M. Staunton. Mr. MacCorkle has also been made chairman of the board of that company.

Arthur M. Hill Advanced at Charleston

Arthur M. Hill, the new vice-president and general manager of the Charleston Interurban Railroad at Charleston, W. Va., is a well-known figure in the railway and bus field. Last



A. M. Hill

year he was elected president of the state bus operators' organization, having served as chairman of the West Virginia Motor Transportation Association's committee on legislation. When the Bus Division of the American Automobile Association was formed on March 19 as the national organization of bus operators, he was elected its first chairman.

Mr. Hill, formerly treasurer, will now have charge of the Charleston Interurban Railroad's transportation system, including its bus lines. He succeeds I. N. Smith, who had been general manager, but who will now be secretary and treasurer. Mr. Hill is a native of Charleston, but spent a large part of his boyhood in the state of Arizona. He enrolled at the University of Missouri, and after completing his studies engaged for a period of seven years in the banking business at Charleston. From this work he entered the United States army, to do his duty during the war. When he returned to civil life he became an executive of the Charleston Interurban Railroad.

He is one of the exponents of the principle of co-ordinated transportation. He says frankly that the growth and development of the bus has been of great help in getting better results from rail operation.

J. E. Carnes a Headliner

J. E. Carnes, recently appointed to take charge of the bus transportation department of the Cincinnati Street Railway, Cincinnati, Ohio, has been discovered by the Cincinnati Post. Of course, to the car riders of that city Mr. Carnes has been known for his geniality for many years, also to the newspapers for the same qualities, but his advancement made of him a public figure. So on its editorial page for April 1 the Post played Mr. Carnes up. Alfred Segal was the author of the sketch. He headed it: "Being the Account of One Who Has Succeeded by the Performance of the Day's Work at His Corner." It does not do to adulterate a sketch of this kind. Here is Mr. Segal's account of Mr. Carnes word for word:

Mr. Carnes steps up in the world. Mr. Carnes has made a success. He has not come to sudden riches, and it is probable that he never will be a rich man.

Mr. Carnes has made a success of the day's work.

Jesse Carnes was a street car conductor on the Walnut Hills lines. In his job there are no opportunities for fame or fortune. One must be courteous; one must be conscientious. There is no call for daring enterprise on the back of a street car; no high places from which to shine in the world. One must be considerate; one must be dutiful.

Jesse Carnes made a success of the day's work on the back of the street car, being courteous, considerate and dutiful.

He was promoted to inspector. There are no opportunities for riches or glory in an inspectorship. One works to do the job well. On bitterest days one stands at street corners to direct the traffic. There are tangles to be unraveled and one must not lose his head in the chaos. There are impatient people who demand when, if ever, the next car is coming, and one must know how to answer wrath with a kind word.

Jesse Carnes made a success of the day's work on the street corners, directing the traffic, keeping his head on his shoulders, and answering with gentle words.

In these tasks he continued year after year, doing the day's work as if there were great rewards of riches or glory in it. To do it well he regarded as his success.

At whatever corners he served he made the best of it. When the officials of the railway determined to establish bus lines, they looked about for one to direct them as superintendent. Jesse Carnes did not apply for the place, but the success of the day's work had lifted him up to a high place in the esteem of the officials and he was chosen.

So Mr. Carnes steps up by the success of the day's work.

We are painfully conscious of the fact that there is no thrill in this story of success. The people thrill only to the success of go-getters who walk today and ride in glittering cars tomorrow.

The success of the day's work does not quicken the blood of the people. They'd rather hear of the success of one who has got rich quickly without work.

The appointment of Mr. Carnes was noted in the JOURNAL for March 6.

F. W. Webster Honored

F. W. Webster, well known in California traction circles, has been appointed vice-president and general manager of the Peninsula Railway and the San José Railroad, with headquarters in San Francisco, Cal. The appointment was announced by Paul A. Shoup, executive vice-president of the Southern Pacific Company, which controls these companies. The appointment was made to fill the vacancy created by the death of F. E. Chapin.

For more than ten years Mr. Webster has been the general manager of all the electric lines in the San Joaquin Valley affiliated with the Southern Pacific. His connection with Central California railroading goes back to the days of Harriman's dream of a great

central state system of electrified lines. He went to Stockton in 1904 to lay out a replacement system of the old narrow gage car line. The new electric line was constructed in 1906. Following this Mr. Webster was transferred to Fresno, to put in a modern electric railway there. Since that time he has been identified with railroading in this section of California. Up to April 10 he was vice-president and general manager of the Stockton Electric Railroad, the Fresno Traction Company, and the Visalia Electric Railroad, and general manager of both the Central California Traction Company and the Minarets Western.

Mr. Webster states that his new appointments will simply supplement the work he is already doing. The situation would mean that his departmental heads would be called upon to do an increased amount of work, as he would no longer be able to visit so frequently all of his offices. For some years Mr. Webster's headquarters have been in Fresno, although he spent most of the time traveling from one to another of the roads under his supervision.

T. J. Brennan Resigns from Dayton Property

Thomas J. Brennan, general manager of the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, has resigned after 22 years service. When eighteen years old Mr. Brennan started as a conductor, remaining in this position two years. When he started to advance his promotions came rapidly. He served in turn as chief dispatcher, head of the line and track departments, assistant superintendent of transportation, purchasing agent and claim agent.

Mr. Brennan has done much to make this one of the popular interurban lines in this section. His efforts in public relation and safety work have done a great deal to keep this line in operation. He has just completed a rehabilitation program providing for track improvements, installation of one automatic substation, seven modern light-weight cars, six freight trailers and two freight motor cars.

T. K. Glenn of Atlanta to Retire

Thomas K. Glenn, long president of the Georgia Railway & Electric Company, Atlanta, Ga., the railway lines of which are operated under lease by the Georgia Railway & Power Company, is to retire from that position to devote more of his time to banking interests.

Mr. Glenn began his railway career in 1891 as secretary to Joel Hurt, then vice-president and general manager of the Atlanta Consolidated Street Railway. In 1902, when the Georgia Railway & Electric Company was organized, he was placed in charge of the claims department and the following year was appointed to the position of vice-president and general manager. This position he resigned in 1908 to become affiliated with the Atlanta Steel Hoop Company, one of the largest manufacturing plants of its kind in the South. In 1913 he was elected third vice-president of the Georgia Railway & Power Company, of which he had also been

a director. Several years later he was elected president of the Georgia Railway & Electric Company to succeed the late Frank E. Block. Mr. Glenn is president of the Atlanta & Lowry National Bank. He is one of the foremost figures in financial affairs in Atlanta.

H. D. Bercaw, New Akron Manager, Talks of Franchise

H. D. Bercaw, the newly appointed manager of the southern division of the Northern Ohio Power & Light Company, formerly the Northern Ohio Traction & Light, with offices at Canton, states that the company is working for a new franchise which will give adequate transportation facilities with centralized management. He said he believed that a public utility should be a monopoly and that future developments would lead to that.

Mr. Bercaw, whose appointment as manager was referred to in the ELEC-



H. D. Bercaw

TRIC RAILWAY JOURNAL, issue of Jan. 9, page 91, was claim agent of the Northern Ohio Power & Light Company at Canton for five years. His transportation duties in Canton might be termed his biggest interest. Since his association with that company he has extended the service by buses in many parts of the city. Though Mr. Bercaw is an Ohioan by birth, he lived a number of years in Indiana. He was born in Darke County, Ohio, but at the age of thirteen moved to Indiana. He attended the Indiana University a year and taught history in the high school at Anderson, Ind., before going to his native state to live. He is a graduate of Otterbein College at Westerville. Mr. Bercaw, associated with traction interests for many years, has full authority in his new position as manager of the Canton and Massillon systems as well as the company's interurban lines south of Akron. In announcing his appointment A. C. Blinn, vice-president and general manager of the entire property, said that the company had felt for some time that the industrial and commercial development of Canton demanded a local resident manager.

Norman Lee, whose experience in transformer design is international, has recently joined the American Brown

Boveri Electric Corporation at Camden, N. J. After graduating as an electrical engineer from the University of Wisconsin Mr. Lee held several positions with the French Thomson-Houston Company, Paris. After ten years with that company he joined the A.E.F. in France. Following the war Mr. Lee designed and manufactured transformers under his own name. In 1923 he returned to this country and joined the Allis-Chalmers Company as a designer of power transformers.

W. H. Vinnedge, who until recently held a position as sales engineer with the Servel Corporation, has joined the railway engineering staff of the American Brown Boveri Electric Corporation. He was graduated from Purdue University.

Jamestown Personnel Reorganized

The adoption of a plan of organization to fix definite control of the property of the Jamestown Street Railway, the Jamestown, Westfield & Northwestern Railroad and the Jamestown Motor Bus Transportation Company, Jamestown, N. Y., was announced recently by George L. Maltby, general manager. Under the new plan Leon H. Johnson becomes general superintendent of the transportation lines; W. H. Pickard, traffic manager; R. A. White, controller in charge of finances; F. H. Kiblin, real estate and tax agent; Richard G. Holmes, superintendent of power distribution; Keith L. Conners, superintendent of motive power; Eugene A. Post, superintendent of buildings and bridges; Axel Westergren, superintendent of roadways; C. L. Lammers, superintendent of transportation; A. Raymond, superintendent of buses; Walter J. Cole, storekeeper; E. H. Waterman, assistant to the general superintendent; Ray Miller, car accountant and paymaster.

Obituary

Frank G. Hart, superintendent of transportation of the Bloomington, Ill., division of the Illinois Power & Light Corporation, died April 21. He had been connected with the traction system in Bloomington more than 30 years and for nearly four years was superintendent of the transportation division.

Ray W. Reynolds, at one time superintendent of the Terre Haute, Indianapolis & Eastern Traction Company, at Lebanon, Ind., and later a superintendent at South Bend, Ind., died at his home in South Bend recently. He was a graduate of Purdue University and of Armour Institute of Chicago. He was 43 years old.

William Keller, day depot master at East New York station of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died recently. Mr. Keller began his railroad career in 1898 as a conductor with the old Nassau Railroad at the Ninth Avenue depot, but was two years out of service before being appointed at East New York depot in 1908. He was appointed night depot master on Aug. 6, 1914, and in June, 1916, was appointed to the position he held at the time of his death.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Grand Rapids Cars Are Soon to Be Delivered

Construction of the 27 new de luxe type street cars for the Grand Rapids Railway, Grand Rapids, Mich., is nearing completion and it is expected that delivery will be begun shortly. The cars when delivered will be equipped with spring bumpers of the auto type at each end. They will have two headlights at the front end in shapely reflectors attached to the front dasher. A tail-light and spotlight are provided at the rear end of the cars. The unit as shipped will be equipped with de luxe highly upholstered individual bucket type seats. The car bodies will be mounted on St. Louis Car Company E.I.B. type trucks, the standard equalized easy-riding graduated spring truck of that company. As an added feature the side frame equalizer will be adaptable to receive either a friction bearing box or a roller bearing box.

Twenty-three of the cars will be equipped with friction bearing boxes and four will be equipped with roller bearing boxes, two each of the Hyatt and S K F types. At any future time, at the pleasure of the railway, the friction bearing boxes may be removed and roller bearing boxes installed without any alterations in the truck frame. This particular truck was developed along these lines, especially for the Grand Rapids Railway, and it is the first installation of its kind.

The new cars will be provided with the same type of light shield, equipped with high-powered lamps to illuminate the front dash, as appeared on the "St. Louis" sample car built by the St. Louis company some time ago. The principal specifications of the Grand Rapids cars were published in the issue of ELECTRIC RAILWAY JOURNAL for Dec. 5, 1925.

Graybar Organization Changes

A reorganization of the sales department, involving the reallocation of the managing personnel and the creation of several new activities, to take effect immediately, has been announced by G. E. Cullinan, vice-president in charge of sales of the Graybar Electric Company.

The reorganization, together with the staff designation of the personnel, is as follows: M. A. Curran, assistant to vice-president, formerly manager of the central station department; J. L. Ray, general supply sales manager, formerly manager of supply and equipment department; E. A. Hawkins, general telephone and appliance sales manager; G. F. Hessler, general utilities sales manager, formerly manager line material sales department; G. K. Heyer, assistant general supply sales manager,

formerly telephone sales manager; A. J. Eaves, public address and carrier current sales manager; P. M. Rainey, telephone sales manager, formerly sales development manager; G. E. Chase, broadcasting sales manager, formerly broadcasting sales engineer; O. E. Richardson, broadcasting sales engineer; J. W. Skinkle, signaling sales manager; A. E. Hetzner, signaling sales engineer; and A. S. Wise, appliance sales engineer.

The above changes in staff personnel are the culmination of a reorganization of the Graybar general sales organization which has been in course of development for some time.

Rehabilitation Program in West Milton

An improvement program for West Milton, Ohio, was recently completed by T. J. Brennan, general manager of the Dayton, Covington & Piqua Traction Company. He recommends the acquisition of seven modern, light-weight cars, six freight trailers and two freight motor cars. Rebuilding of tracks and the installation of one automatic substation are included in his program.

Chicago Will Have 100 New Cars

The Chicago Surface Lines has been authorized to purchase 100 new street cars. These are expected practically to duplicate a similar group of 100 cars which were ordered in the spring of 1924 and placed in service the same year. Bids have been requested on the units, which are to be double-truck, double-motor cars adapted for multiple-unit operation. Complete data on the cars purchased in 1924 were published in the issue of ELECTRIC RAILWAY JOURNAL for Nov. 15, 1924. That the present order for 100 cars is to be placed in the last year of the Surface Lines' franchise is evidence of the confidence which the officers of the company have in the satisfactory outcome

Metal, Coal and Material Prices

Metals—New York		April 27, 1926
Copper, electrolytic, cents per lb.		14.037
Copper wire, cents per lb.		16.00
Lead, cents per lb.		7.875
Zinc, cents per lb.		7.22
Tin, Straits, cents per lb.		63.75
Bituminous Coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons		\$4.125
Somerset mine run, Boston, net tons		1.975
Pittsburg mine run, Pittsburgh, net tons		1.95
Franklin, Ill., screenings, Chicago, net tons		1.925
Central, Ill., screenings, Chicago, net tons		1.50
Kansas screenings, Kansas City, net tons		2.50
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.		\$6.25
Weatherproof wire base, N. Y., cents per lb.		18.00
Cement, Chicago, net prices, without bags		2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.		11.04
White lead in oil (100-lb. keg), N. Y., cents per lb.		15.50
Turpentine (bbl. lots), N. Y., per gal.		\$0.90

of the complex local situation and in the future of the electric railway industry.

W. E. Kelly Now with Hegeman-Castle

W. E. Kelly has been appointed general manager of the Hegeman-Castle Corporation, with headquarters in the Railway Exchange Building, Chicago, Ill., replacing H. T. Heath, who has resigned. Mr. Kelly entered the service of the Illinois Central Railroad in 1898, serving in various capacities in the store, mechanical and purchasing departments and leaving in 1907 to engage in the railway supply business as manager of the Chicago territory for the Elkhart Rubber Works.

In 1911 he accepted service with the Patton Paint Company as railroad sales representative in Chicago and the Western territory and was appointed manager of railway sales in 1916, resigning in 1918 to go with the Central Railway Signal Company, Boston, Mass., as Western representative. He will still continue to represent the Central Railway Signal Company in addition to his new duties as general manager of the Hegeman-Castle Corporation.

Storage Battery Business Is Good

Activity in the storage battery field so far in 1926 has been on a par with the corresponding trade in 1925, at least in the experience of the Electric Storage Battery Company, Camden, N. J., one of the largest manufacturers of batteries in the United States. Incidentally, the 1925 period was exceptionally good, so that the previous statement has considerable significance. Herbert Lloyd, president of the company, stated at the annual meeting of stockholders that indications for the remainder of 1926 are very good and that there has been no let-up in the volume of new business thus far in the year.

Chicago Gets Substation from Westinghouse

The Westinghouse Electric & Manufacturing Company has recently received an order from the Chicago Surface Lines for a 4,000-kw., 600-volt direct-current automatically controlled substation to be located on Grimm Avenue, Chicago, Ill. The order calls for two 2,000-kw., 60-cycle, 600-volt synchronous converters with six 667-kva. OISC, single-phase, outdoor transformers, stepping down from 2,000 volts high tension to converter voltage. Automatic switching equipment for the control of these two units and a set of supervisory control equipment are also included in this contract.

The automatic switching equipment will provide full protection for unattended operation of two 12,000-volt, three-phase incoming lines, two 2,000-kw. synchronous converters and seven 600-volt d.c. feeders. Four electrically operated high-tension oil circuit breakers will be provided and arranged so that by means of a high-tension bus either or both converters may be sup-

plied from either or both incoming lines.

The total output of the station will be supplied to the present direct-current network through seven 2,000-amp, short-circuit detector, automatic service-restoring feeders.

Supervisory control of the synchronous visual type will permit the dispatcher located in the Crawford Avenue station to supervise and control the operation of this Grimm Avenue station.

Electrical Business in Germany Shows Upward Trend

German electrical equipment manufacturers enjoyed a prosperous export year in 1925, according to recently published statistics. The market price for stocks of electrical equipment companies showed this German industry to be one of the most prosperous of the country. In fact, as a whole it ranked third only behind banking and brewing in maintaining a high level of stock quotations.

Domestic business was fairly good considering general economic conditions. Foreign business was satisfactory even in comparison with previous inflation years, and some of the larger companies were in such an advantageous position that they were able to secure large foreign loans. Prices both at home and abroad were maintained in all lines. Several large foreign contracts for complete power plants were obtained.

Railway electrification was extended to additional lines in various parts of the country. The electrical development of Germany utilizing both lignite deposits and water power spread rapidly during 1925 and is continuing, according to Trade Commissioner Theodore Pilger of Berlin.

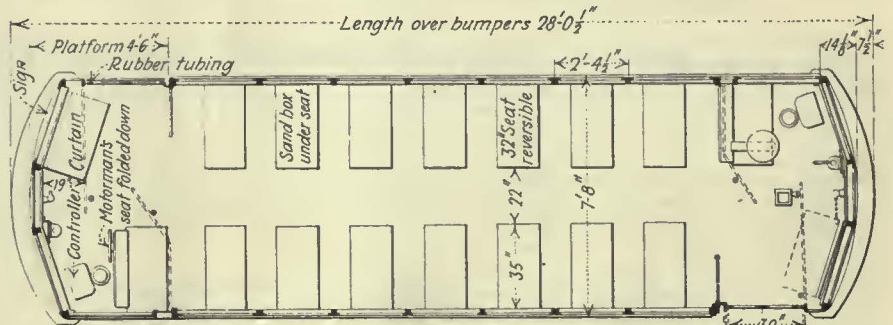
R. F. Fiske Heads Sales for Nuttall

R. F. Fiske, for several years manager of the R. D. Nuttall Company, Philadelphia office, has been appointed sales manager, with headquarters at Pittsburgh. He takes the place of Q. W. Hershey, resigned. John E. Mullen has been appointed assistant sales manager.

Mr. Fiske is a New Englander, receiving his early education in the public schools of Massachusetts and his technical education at Harvard. After graduation he was with General Electric Company at the Lynn and Pittsfield plants. He moved to Pittsburgh in 1908 to join the sales force of the Union Electric Company, Nuttall agents. In 1917 he became a member of the Nuttall sales force, and in 1919 was made manager of its Eastern sales activities. His recent appointment is a well-earned recognition of his ability to direct both sales policies and men for the company.

Mr. Mullen entered the employ of the Nuttall company in the capacity of a junior clerk. He has held many important positions with this concern, and is classed as one of the old-timers in point of service, with a thorough knowledge of the company's policies and products.

Delivery of Cars to Fort Smith Is Made



Shipment has been made of six single-truck, double-end Birney safety cars constructed by the American Car Company, St. Louis, Mo., for the Fort Smith Light & Traction Company, Fort Smith, Ark. The cars, whose bodies weigh 6,500 lb., will have a seating capacity of 32. The principal specifications on these new units are appended here:

- Length over all 28 ft., 3/4 in.
- Truck wheelbase 8 ft.
- Width over all 8 ft.
- Height, rail to trolley base..... 9 ft., 10 1/2 in.
- Body All steel
- Interior trim Mahogany
- Roof Arch
- Air brakes Westinghouse
- Axles Brill
- Bumpers Channel
- Car signal system Faraday
- Car trimmings Bronze
- Compressors Westinghouse DH-16
- Control K-63
- Curtain fixtures.....Curtain Supply Company
- Curtain materialPantasote, K-2-86

- Destination signsHunter illuminated
- Door-operating mechanismAmerican Car Company
- Fare boxesJohnson, DM-3
- WheelguardsAmerican Car Company
- Gears and pinions.....General Electric
- Hand brakes.....American Car Company with drop brake handle
- Heater equipmentConsolidated
- HeadlightsCrouse-Hinds "Golden Ray"
- Journal bearingsFriction type
- Journal boxesBrill
- Lightning arrestersGeneral Electric
- Motors.....Two GE-264, inside hung
- Finish..Pratt & Lambert, vitralite railway enamel
- RegistersSterling
- SandersAmerican Car Company
- Sash fixturesO. M. Edwards
- SeatsBrill "Waylo" type
- Seating material.....No. 203, green plush
- Slack adjusterBrill
- SpringsBrill
- Step treadsFeralun
- Trolley catchersOhio Brass
- Trolley baseOhio Brass
- Trolley wheels...Kalamazoo with bayonet
- Trucks.....Brill special No. 79-E
- Ventilators.....Brill exhaust type
- WheelsRolled steel, 26 in.

Use of Balloon Tires on Buses Increasing

That low-pressure, or balloon, tires are coming into use on buses and motor trucks at a much faster rate than is generally realized was indicated by J. M. Linforth of the Goodyear Tire & Rubber Company at a meeting of the Cleveland section of the Society of Automotive Engineers. He stated that since 1923 his company had put on approximately 300 of this type of tire for buses and had been watching their performance closely. Seven sizes are now in regular factory production, and of these Goodyear believes that the 36x8.25 size will be the most popular, as it has been found most suitable for the average 29-passenger bus. The 34x7.50 size will be used on vehicles of smaller capacity. Mr. Linforth went on to say:

Our experience seems to indicate that at least as much mileage should be obtained from the balloon tires as from high pressure tires; tests have shown actually greater mileage. We are convinced from actual results that they should not puncture more easily or frequently than high pressure tires.

One of the important advantages derived by the use of balloon tires is the decrease in running time of the vehicle due to an increase of the minimum speed without any increase of maximum speed. We have found that the motorcoach balloon tires hold the road on wet as well as dry surfaces much better than high pressure tires. Many operators have remarked that they are able to make stops with balloon tires that would be impossible with high pressure tires. Thus the balloon tires add to the safety of motor coach operation.

Yellow Buses Will Be Among General Motors Exhibits

Included in the permanent exhibit which the General Motors Corporation will open on the Steel Pier, Atlantic

City, during July will be the products of the Yellow Truck & Coach Manufacturing Company. This will be the first permanent exhibit at which all of the products of General Motors will be displayed under one roof and will occupy 22,000 sq.ft. of floor space. In addition to Yellow Truck & Coach products, the exhibit will embody the six lines of General Motors passenger cars; GMC trucks, Fisher body products and all of the various General Motors parts and accessories manufacturing companies. At night the exhibit building will be illuminated by an animated sign 65 ft. in length and a fixed electric sign 290 ft. long, one of the largest signs of its kind in the world.

A. E. Allen Now Vice-President of Lamp Works

Arthur E. Allen was elected a vice-president and a member of the board of directors of the Westinghouse Lamp Company, New York, N. Y., at a meeting of the board of directors held April 7. Mr. Allen will replace T. G. Whaling, who died recently. Prior to taking over his new duties, Mr. Allen was general manager of the Westinghouse Lamp Company. He has long been affiliated with the Westinghouse Electric & Manufacturing Company, having entered the employ of that concern at the Newark works in 1902, subsequently being placed in charge of the test department. Later he became manager of the supply department of the New York sales offices, then executive assistant of the manager and then manager of the New York district sales office. In April, 1925, he was made general manager of the lamp company.

Rolling Stock

Altoona & Logan Valley Electric Railway, Altoona, Pa., has purchased five buses from the Yellow Truck & Coach Company, Chicago, Ill.

Key System Transit Company, Oakland, Cal., has placed an order with the Differential Steel Car Company of Findlay, Ohio, for ten Differential cars. Six of these will be motored and four trailers.

Boston Elevated Railway, Boston, Mass., has added five city type mass buses to its large bus fleet. The new equipment will operate at a 6-cent fare on the 2-mile Brooks Street route.

Miami Beach Railway, Miami, Fla., has just received four six-cylinder gas-electric buses from the Fageol company, Kent, Ohio. Electrical equipment for these units was supplied by the General Electric Company.

Boston Elevated Railway, Boston, Mass., has recently purchased six Differential Cars from the Differential Steel Car Company of Findlay, Ohio. These cars will all be motor cars and will be equipped with Westinghouse HL control.

Interborough Rapid Transit Company, New York, N. Y., has been ordered by the New York Transit Commission to buy 382 new cars, costing about \$10,000,000. This is part of a general order looking toward an increase in the facilities of the company.

In defraying the cost of this program the city will participate under the dual rapid transit contracts. The company expects to appeal from the order to the members of the incoming commission, just appointed by the Governor.

Boston Elevated Railway, Boston, Mass., has ordered 100 new cars for use in main line elevated service. Of this total, 75 will be built by the Wason Manufacturing Company, Springfield, Mass., and 25 by the Laconia Car Company, Laconia, N. H. Delivery of the units will be made at a rate of two per week beginning Nov. 26, 1926. Many of the details of the new units have yet to be decided upon and orders for much of the equipment remain to be placed. Some of the principal specifications are available, however, and are given here:

Seating capacity	44
Bolster centers, length	32 ft., 3 $\frac{1}{2}$ in.
Length over all	46 ft., 7 $\frac{1}{2}$ in.
Truck wheelbase	6 ft., 0 in.
Width over all	8 ft., 7 $\frac{1}{2}$ in.
Height, rail to top	12 ft., 9 $\frac{1}{8}$ in.
Body	All steel
Interior trim	Steel
Headlining	Agasote
Roof	Combination
Couplers	Tomlinson
Curtains	None
Destination signs	Electric Service Supplies
Energy-saving device	Rico coasting clocks
Journal bearings	Plain
Journal boxes	Cast steel
Motors, two Westinghouse 301, inside hung	
Trucks	motor, Baldwin; trailer, Taylor
Wheels	34 in. and 31 in.

Aurora, Elgin & Fox River Electric Company, Aurora, Ill., has just ordered eight safety cars from the St. Louis Car Company, St. Louis, Mo. One Fageol bus, equipped with Westinghouse air brakes, was also purchased.

Twin City Rapid Transit Company, Minneapolis, Minn., is now building a new type of two-car train for use in St. Paul and Minneapolis. If the experimental service of the first train is satisfactory, this type will be the basis for future replacements and expansions of equipment in the Twin Cities.

Track and Line

Madison Railways, Madison, Wis., will rebuild all of its tracks around Capitol Square on Mifflin Street, Carroll, West Main and Pickney Streets. The tracks will be raised and a new concrete base will be laid preparatory to the city repaving these streets.

Des Moines City Railway, Des Moines, Iowa, plans to lay new track within the coming twelve months at a cost of between \$30,000 and \$40,000. The extension will be more than 1 mile long. A ten-year fight has been waged over the location of the extension.

Power Houses, Shops and Buildings

Louisville, Ky.—Work is to start this spring, it is understood, on the proposed new consolidated interurban station to be used by the Louisville & Interurban Railroad, a suburban division of the Louisville Railway, and also the Interstate Public Service Company, operating the lines between Louisville and Indianapolis. The new station will cost about \$500,000. When the new building is completed the two present interurban stations will be abandoned. The new

quarters will house all offices and operating departments. Land for the new station was bought two or three years ago, but building has been held up on account of financial conditions.

Public Service Railway, Newark, N. J., through its bus subsidiary, the Public Service Transportation Company, is erecting a garage at Turnerville, N. J., to house the buses that operate in South Jersey. The garage will front 300 ft. along the Black Horse Pike.

Trade Notes

Watson-Stillman Company announces that on and after May 1, 1926, its main offices and sales department will be located in the Evening Post Building, 75 West Street, New York, N. Y.

Gould Car Lighting Corporation, Baltimore, Md., has filed a certificate in the office of the Secretary of State to allow it to do business in New York State. It is capitalized with 10,000 shares of no par value. Its New York office is located at 250 Park Avenue.

Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio, announces that new shades of Kemi-suede have been produced and are now ready for the market. Blue, green, maroon, black and nut brown have been added to the line, along with dark fawn, light fawn, blue gray, mixed gray, buckskin and neutral gray. Among the railways which have specified Kemi-suede are those in Cleveland, Milwaukee and Grand Rapids.

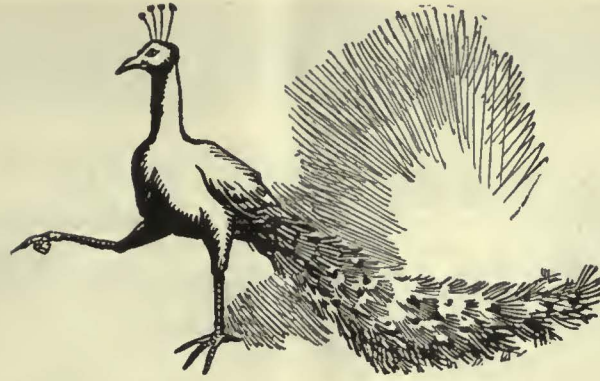
National Railroad Trolley Guard Company, Olean, N. Y., has disposed of all of its stock and rights to the Ohio Brass Company, Mansfield, Ohio, and notice of the dissolution of the corporation has been filed with the Secretary of State. For some years prior to taking over the assets of the National Railroad Trolley Guard Company the Ohio Brass Company was the exclusive sales agent for the former concern.

New Advertising Literature

J. Rowland Bibbins, consulting engineer, Washington, D. C., has issued a leaflet giving two essential transit-traffic determinations, namely, renewal liability and the traffic-thoroughfare plan. Also, representative surveys of Philadelphia and Indianapolis are briefly sketched, and a number of factors in proper budget determinations are given.

Allen-Bradley Company, Milwaukee, Wis., has issued a leaflet illustrating its motor starters for all types of alternating-current motors.

Crouse-Hinds Company, Syracuse, N. Y., has issued a folder describing various types of condulets for grounding service wires and conduit systems. As stated in the folder, the importance of a well-grounded system with ground wires thoroughly protected from mechanical injury has been gaining rapid recognition and is now a requirement of the 1925 code of the National Board of Fire Underwriters. Type GC condulets are listed in addition to No. 2089.



Provide adequate protection for modern light-weight cars

To protect the investment called for in the modernization movement is merely common sense. One of the protective measures is to install dependable hand brakes on all the new cars—Peacock Staffless Brakes.

They develop tremendous braking power—1066 lbs. with a 16-in. handwheel and 2000 lbs. with a 20-in. wheel. Even though brake rigging may be loose and brake shoes worn Peacocks have ample chain-winding capacity—144 in.—to take in all the slack and set the brakes.

The minimum platform space required, the simplicity of operation and the low maintenance charges are other important factors that make Peacock Staffless Brakes an economical form of protection for modern light-weight cars.

Complete information sent on request.

National Brake Company, Inc.

890 Ellicott Square

Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Co., Ltd., Montreal, Can.

Staff less

Peacock

Brakes



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Ford, Bacon & Davis Incorporated Engineers

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The J. G. White Engineering Corporation

Engineers—Constructors

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Examinations—Reports—Valuations
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Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

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THE P. EDWARD WISH SERVICE

50 Church St. NEW YORK Street Railway Inspection DETECTIVES 131 State St. BOSTON

When writing the advertiser for information or prices, a mention of the Electric Railway Journal would be appreciated.

Coin Counting and Sorting Machines

FARE BOXES

Lever-Operated and Slip Change Carriers. Tokens.

The Cleveland Fare Box Co.

Cleveland, Ohio Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.

A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we fill differ only in magnitude; small orders command out utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we built. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut



Gets Every Fare
PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

Perey Manufacturing Co., Inc. 101 Park Avenue, New York City



RAIL BONDS-RAIL JOINTS DYNAMOTORS WELDING ROD

UNA Welding & Bonding Co. Cleveland, Ohio



Adapted to all Types of rails and paving.

GODWIN Steel Paving Guards

Proven by service to economically prevent seepage and disintegration of street railway paving.

Write for Illustrated Catalog No. 20

W. S. GODWIN CO., Inc. Race and McComas St., Baltimore, Md.

D-O-L-L-A-R-S Mean Nothing!

---unless you know exactly what you get for them.

In using an accelerator, you may be *saving a little* on the cost of the material, and *wasting a lot* on labor in handling, errors in mixing, and inferior quality in results.

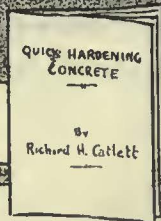


CAL is not only an accelerator in itself-- but it permits a double acceleration by "fattening" the mix so that it can be handled easily with a smaller water content.

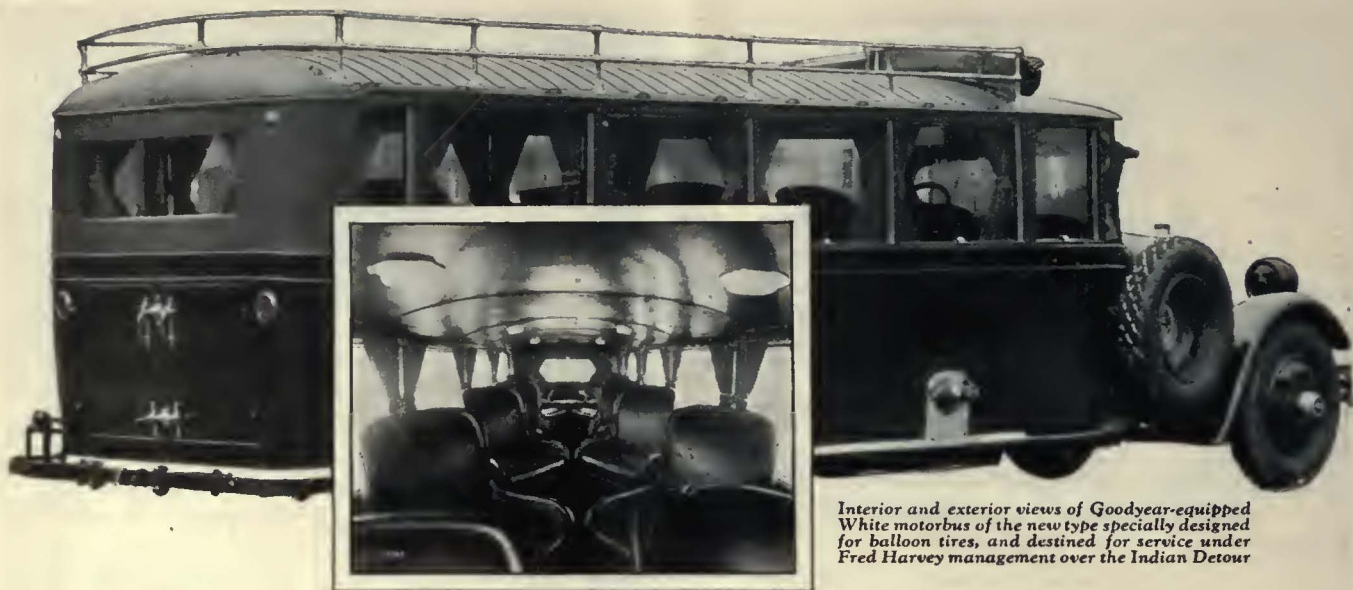
This "fatter", dryer mix produces a vastly denser, harder, and more durable concrete.

CAL saves labor and mistakes by its very form -- it is a white, dry powder easily added by volume right at the mixer.

CAL costs more per pound than ordinary calcium chloride -- but *does more*. It costs less than other accelerators, does all that they do *and more*. INVESTIGATE!



Write for this free book
North American Cement Corporation
Hagerstown - - Md.



Interior and exterior views of Goodyear-equipped White motorbus of the new type specially designed for balloon tires, and destined for service under Fred Harvey management over the Indian Detour

What SUPERTWIST Adds to Goodyear Tires

YOU know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other

injuries. It thus insures virtually *double* the carcass life of the tire.

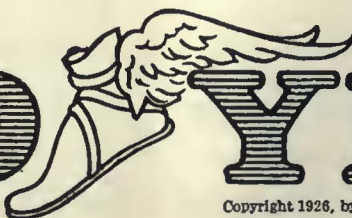
Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort, and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR



“Brothers Under The Skin”



“RESEMBLANCE is an unmistakable sign of relationship.” So say the biologists, but somehow we cannot agree. There is no physical resemblance whatsoever between a trolley car and a magazine. Yet both are *common carriers*. They are brothers under the skin.

The only *real* difference is that one carries passengers while the other carries stories, articles and advertisements.

If a passenger attempted to transport himself on foot, on horseback or by private automobile, he would find it more expensive than to travel on a railway. It is his willingness to travel in the company of others, thus sharing the expense, which makes railway transportation economical for individuals.

If an advertiser, similarly, tried to send his message individually to every buyer, he would find it more expensive than to let it travel in the company of others in the common advertising carrier—the magazine.

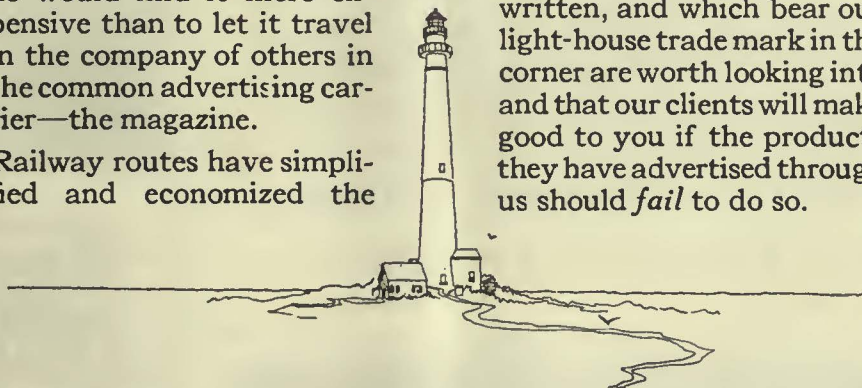
Railway routes have simplified and economized the

distribution of human beings. Advertising routes have simplified and economized the distribution of the things that human beings buy.

Suppose, for instance, that an equipment manufacturer had produced a new car ventilator or car heater which he wanted to describe to railway officials. He could send his salesmen out to make some 750 individual calls. But he would find it both quicker and cheaper to place his message on board a common advertising carrier and let it travel out to you at a nominal cost per visit.

The advertiser or seller, moreover, is not the only one who benefits. Advertising reduces certain of the costs that make up price. The *buyer himself*, therefore, will find it economical to study and select from advertisements.

We can assure you that the advertisements we have written, and which bear our light-house trade mark in the corner are worth looking into and that our clients will make good to you if the products they have advertised through us should *fail* to do so.



Doyle, Kitchen & McCormick, Inc.

2 WEST 45th STREET, NEW YORK.



An Advertising Agency

KELLY

heavy-duty

CORD

What Mr. Warner thinks of Kelly Heavy Duty Cords

LIKE any other motor coach operator, the City Transit Co., Cincinnati, O., is interested in the service offered by different tires.

"Very naturally," writes Mr. C. S. Warner, President, "we have tried out several makes of tires. The photographs you have of our fleet will show that practically our entire equipment is on Kelly-Springfield Heavy Duty Cords. This, we think, would indicate what we think of your tires."

Mr. Warner is not alone in his discovery of the satisfactory service given by Kelly Heavy Duty Cords. Motor coach operators all over the country find Kellys so economical and so satisfactory that the number who are using them exclusively is growing continually.

KELLY-SPRINGFIELD TIRE CO.
250 West 57th Street New York, N. Y.



Motor Coach Operators—Advertise your business by affixing these attractively colored stickers to your passengers' baggage. We will gladly send you FREE as many as you can use.

Bus Companies Operating 10 or More White Busses

American Motor Tours Co	15
A. L. Ammen Transportation Co.	48
Benguet Auto Line	10
Blue Ridge Transportation Co	14
Bingham Stage Line	11
Boston Elevated Railway Co	80
Boston and Maine Railroad	15
Bardsleys Motors, Ltd.	27
Brewster Transportation Co., Ltd.	14
California Transit Co.	10
Carolina Transit Company	10
Casper Motor Bus Line	16
Chicago North Shore & Milwaukee R. R. Co.	19
Cleveland Railway Company	53
Cleveland, Ashtabula, Conneaut Bus Co.	35
Cleveland, Elyria, Toledo Bus Co.	12
Coleman and Clark	10
W. I. Coldiron	10
Columbia Stage Company	34
Comfort Coach Co., Ltd.	10
The Connecticut Company	23
Connecticut Motor Transportation Co.	16
Copper Range Motor Bus Co.	11
Daytona Shores	10
Denver Cab Company	12
G. T. Elliott	10
Emerick Motor Bus Company	10
Florida Motors Line Inc.	39
Fulvia Hotel Garage	11
Fullington Auto Bus Company	13
Garfield-Passaic Transit Co.	18
Glacier Park Transportation Co.	48
Gloucester Auto Bus Company	21
Golden State Auto Tours Corp.	12
Grays Harbor Ry. & Power Co.	10
Gulf Coast Motor Lines	10
Fred Harvey	31
Hileah-Alipattah Bus Line	18
Hollywood Land & Water Co.	61
Hong Kong Hotel Co., Ltd.	11
Illinois Power & Light Corp.	17
Independent School Dist. (Minn.)	30
Interstate Public Service Co.	12
Interurban Transportation Co.	11
Iron Range Transportation Co.	15
Johnson Bus Lines, Inc.	10
Jefferson County, Ala. Bd. of Education	32
Kern County, (California)	26
Leyte Land Transportation Co.	14
Lakewood Development Corp.	15
Longview Public Service Co.	14
Louisville Railway Co.	12
George E. Marsters, Inc.	22
McMahon Transportation Co.	47
George E. Merrick (Coral Gables Corp.)	20
Mesaba Transportation Co.	32
Middlesex & Boston Street R. R.	67
Milwaukee Elec. Ry. & Lt. Co.	10
Motor Bus Co. (Chippewa Falls, Wis.)	117
Motor Transit Company	10
Newman Brothers	11
New England Transportation Co.	96
Northern Ohio Traction & Light Co.	43
Northland Transportation Co.	12
Original Stage Line	80
Pacific Electric Railway Co.	13
Park Auto Transportation Co.	28
Peninsula Rapid Transit Co.	50
The P. and O. Coach Lines	10
Pioneer Tourist Coaches, Ltd.	19
D. Peters	12
Pike's Peak Auto Highway Co.	108
Public Service Transportation Co.	23
Puyallup-Tacoma Transit Co.	11
Puget Sound Electric Railway Co.	24
Puget Sound International Ry. & Pr. Co.	20
Queens Bus Line Company	82
Rainier National Park Co.	10
Richmond Rapid Transit Co.	34
Rocky Mountain Parks Trans. Co.	40
Saginaw Transit Company	15
St. Louis Bus Company	14
Salt Lake Transportation Co.	36
San Francisco Municipal Ry.	13
S. R. P. & S. Auto Stage Co.	33
Seminole Sightseeing Service	41
Sioux Falls Traction System	65
Spokane, Portland & Seattle R. R.	19
F. H. Stewart	40
*Stone & Webster Interests	24
Teche Transfer Company	10
Twin City Motor Bus Company	18
Tokyo Shigai Jidosha Co.	13
Union Auto Transportation Co.	13
United Automobile Services, Ltd.	11
United Elec. Rys. Co. (Providence)	40
United Transportation Co.	13
United Rys. & Elec. Co. (Baltimore)	10
Virginia Electric & Power Co.	18
Washington Railway & Elec. Co.	11
White Transit Co., Inc., Plymouth, Pa.	13
White Transit Co., Ltd., Sydney, Australia	10
Wisconsin Power & Light Co.	13
Wood River & Alten Bus Lines	301
Yellowstone Park Transportation Co.	40
Yosemite National Park Co.	40
Youngstown Municipal Ry. Co.	18
Zamboanga Transportation Company	18
Total	3080

*Exclusive of subsidiary or affiliated companies individually listed.



White Model 50-B Bus—25 to 29 Passengers

108 Bus Companies Operate 3080 White Busses in Fleets of 10 or More

Successful bus operators must have dependable and economical equipment. Competition compels it. Scores of the leading bus operators of the United States and Canada have standardized on White Busses. They buy Whites year after year. They don't guess. They know bus value. . . . They know that White Busses can be depended upon for uninterrupted transportation over hundreds of thousands of miles.

Convincing evidence of satisfactory White Bus performance is offered in the accompanying list of 108 bus companies operating 3,080 White Busses in fleets of 10 or more. Hundreds of other bus companies operate Whites in fleets of less than 10.

There are more than 7,500 White Busses on the road—far more than any other high-grade make.

Let us send you free the 1926 White Roll Call Booklet listing 961 concerns in all lines of business operating 35,755 Whites in fleets of 10 or more. Address Room 20.

THE WHITE COMPANY
CLEVELAND

WHITE BUSES

MADE RIGHT - SOLD RIGHT - KEPT RIGHT

67 $\frac{1}{2}$ % Less Vibration On Buses equipped with "Gruss Twins"

*Actual test with Vibrometer
proves Gruss Air Springs
accomplish amazing results*

RECENTLY an actual vibrometer test was made to find out just how greatly Gruss Air Springs reduce vibration due to road shock on buses.

This test was made on two buses of the same model during their regular run. Bus A was Gruss equipped. Bus B was not.

Both buses traveled over the same route. Normal loads were carried. Schedule rate of speed was maintained.

Readings of the vibrometer showed that when partially loaded vibration in Bus A, Gruss equipped, was 52 $\frac{1}{2}$ % less than in Bus B, not Gruss equipped.

Results were even more startling when buses were fully loaded! In that case vibration in the Gruss equipped bus was 67 $\frac{1}{2}$ % less than in the bus without Gruss protection.



You know the toll vibration takes in breakage; the repair bills and lost operating time due to lay-ups that it is responsible for.

Then why not reduce this vibration and the expense it causes you? Why not make your buses so comfortable to ride in that the comfort itself causes comment among the passengers and increases patronage? Why not get the longer life from your buses and the greater tire mileage that is affected by air cushioning your buses with the Gruss Twins?

Today hundreds of bus operators are cutting their maintenance costs and building patronage with Gruss Air Springs.

We'll be glad to give you details in person at your convenience.

THE CLEVELAND PNEUMATIC TOOL CO., CLEVELAND, O.
Distributors and Service Stations in Principal Cities

GRUSS AIR SPRINGS

*for Trucks, Buses
Passenger Cars ~*





The construction of Gibraltar Bodies has been particularly gratifying. Against all competition, they have stood the test in that great proving ground, the routes of the Detroit Motorbus Company. Security to passengers, comfort, clear vision, low initial and maintenance cost have been responsible for this enviable reputation.

The AUTO BODY Co.

LANSING

MICHIGAN

Designers and Manufacturers of Motor Coach and

Bus Bodies, Open and Enclosed Automobile Bodies

Gibraltar

Bodies ~

Trademark Registered in United States and

Canada. Applied for in foreign countries



Time does Tell



26 years of Satisfactory Ohmer Service

Of the hundreds of electric railway companies now using Ohmer Fare Registers, *one hundred and forty-eight* companies have used them continuously for periods varying from ten to twenty-six years.

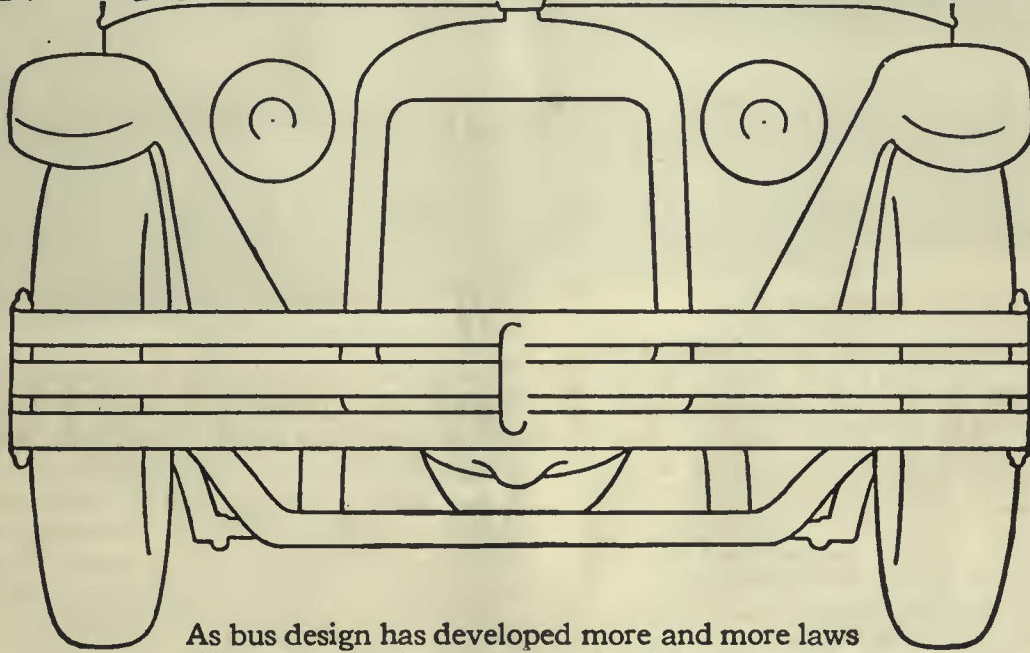
It is the usual thing for companies which once fully adopt the Ohmer System of fare protection to appreciate its value and stick to it. Of course, exactly the same Ohmer Fare Registers have not been used all through the years because our customers have been supplied with improved devices from time to time to mark the changing need but it was the OHMER SYSTEM OF FARE PROTECTION all the time. Changing types of cars never changed the basic principles involved in selling a ride.

If you are not entirely satisfied that your fare control is giving to you the maximum of cash or its equivalent returns, we would like to be given an opportunity to demonstrate on one of the lines of your property just what the Ohmer System means to the company using it.

OHMER
REG. U.S. PAT. OFF.
FARE REGISTERS

OHMER FARE REGISTER COMPANY
DAYTON, OHIO, U. S. A.

Longer and Lower and Timken Bearings



As bus design has developed more and more laws of its own, an increasingly prominent part has been awarded to Timken Bearings.

With road clearance a matter of almost micrometer dimensions, Timken Tapered Roller Bearings are contributing the invaluable properties of peak bearing capacity in minimum mounting space. Timken Taper, Timken positively aligned rolls, and Timken-made electric steel carry higher thrust, shock and radial loads without excessive diameter or supplementary parts.

Housings can therefore be much more compact, which favors low suspension, lighter weight, simplicity, accessibility and strength.

Since load capacity means endurance, Timken Bearings improve operating economy as well as design. This is so well established that bus manufacturers are virtually unanimous in their preference for Timkens. For example, at the last exhibition of buses before the experts of the American Electric Railway Association there were 92 Timken-equipped buses, of 93 exhibited!

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN *Tapered Roller* BEARINGS



Youngstown and Suburban Railway Cars built by G. C. Kuhlman Car Company with HASKELITE roofs and PLYMETL Side Panels.

The HASKELITE-PLYMETL Car is Modern In Appearance as Well as in Light Weight

4 Ways to Improve the Appearance of a Street Car

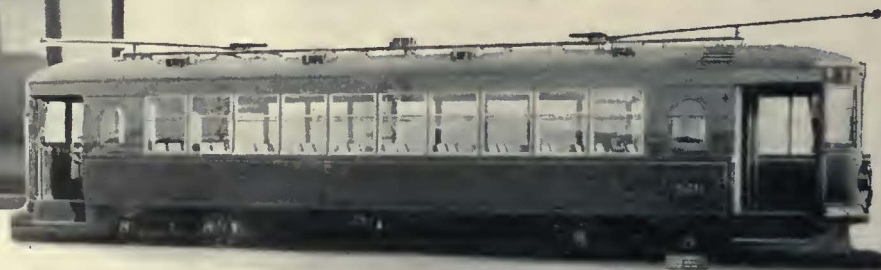
1. PLYMETL Side Panels take a beautiful finish with few coats of paint.
2. HASKELITE headlinings or roofs with headlinings eliminated improve the inside appearance of the car.
3. HASKELITE floors can easily be kept in repair and present an excellent appearance.
4. No more beautiful panelling or interior trim is available than HASKELITE.

MODERNIZE your equipment!—Everybody is trying to do it.

That means improve its appearance so you will attract more passengers, and cut the operating cost so you can make a profit on the business. HASKELITE and PLYMETL fit into both these plans. You probably know the achievements of these materials in cutting weight and thereby reducing operating costs. Note the four ways they definitely improve appearance. You can get both these big advantages in your cars at a cost actually less than for the old antiquated type of construction.

Ask for our Blueprint Booklet containing complete data on HASKELITE and PLYMETL for street car use.

Haskelite Manufacturing Corp.
133 W. Washington St., Chicago



York Railway Cars built by The J. G. Brill Co., are typical of results possible through the use of these light-weight materials.

HASKELITE
and
PLYMETL

Champion Light-weight Pair; Ideal for transportation,—water, land or air.

PLYMETL



MODERN ROLLING STOCK *pays for itself!*

Figures are available to prove it. More inviting in appearance, more comfortable to ride in, making faster trips and shorter stops, the modern car creates increased patronage and reduces the competition of the private automobile. It builds revenue.

Lighter and faster, it operates at less cost and entails lower maintenance expense.

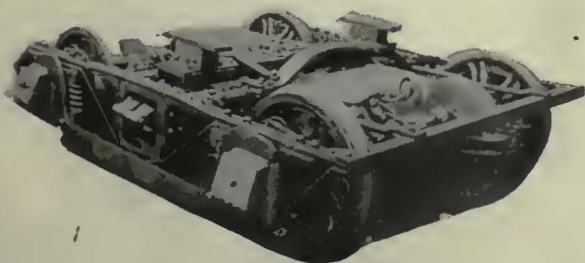
By increasing revenue and reducing costs, the new car pays for itself in a very few years.

Our engineers are thoroughly conversant with the modern features of car design and construction. Let them co-operate with you in working out plans for your projected new equipment—or we will quote on your specifications.

Cummings Car and Coach Co.

Successors to McGuire Cummings Mfg. Co.

111 W. Monroe Street, Chicago, Illinois



MC62 Low Car Body Truck

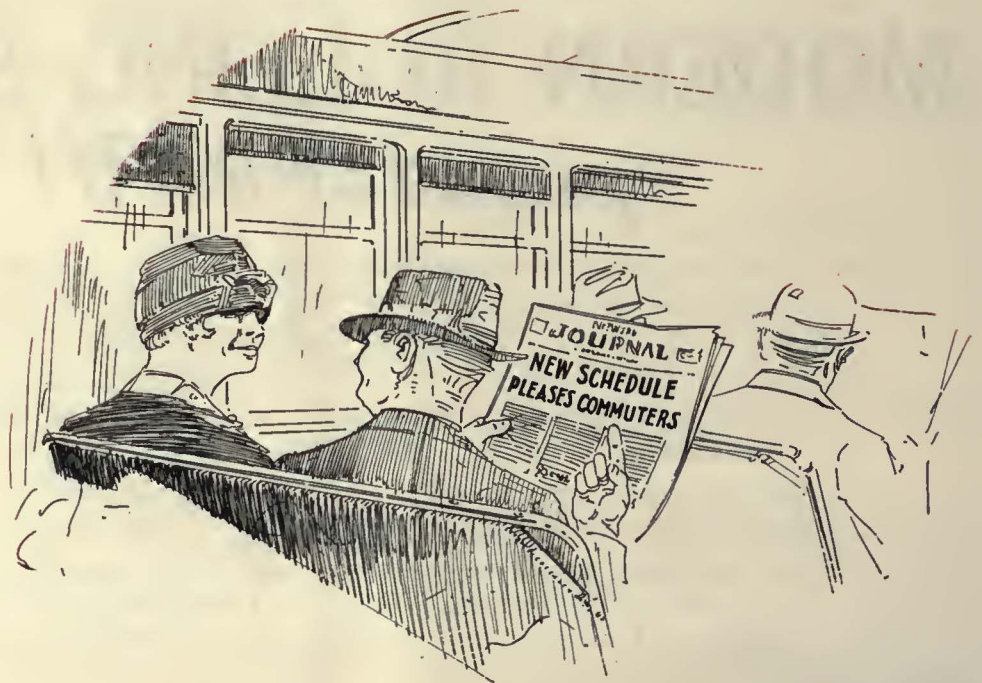
LIGHT WEIGHT, SINGLE AND
DOUBLE TRUCKS

SNOW SWEEPERS AND PLOWS

GAS-ELECTRIC
MOTOR COACHES



*Put the railway
in the headlines—favorably*



Criticism, complaints and abuse in the public press is hard enough to endure at any time. And when there's never anything else, it is indeed a discouraging situation.

Yet the newspapers, as a rule, will print favorable news—if it is news! The advent of new and improved cars, or the inauguration of faster schedules, and similar events, are news items of interest and will be published.

can be done with new cars!

Philadelphia has done it! So has Brooklyn!

The leading metropolitan dailies have given generous publicity to the new cars, and to other modern innovations of these progressive properties. But notice, please, that the Philadelphia Rapid Transit and the Brooklyn City Railroad have thoroughly modernized their rolling stock, and that these cars make schedule speeds which are close to

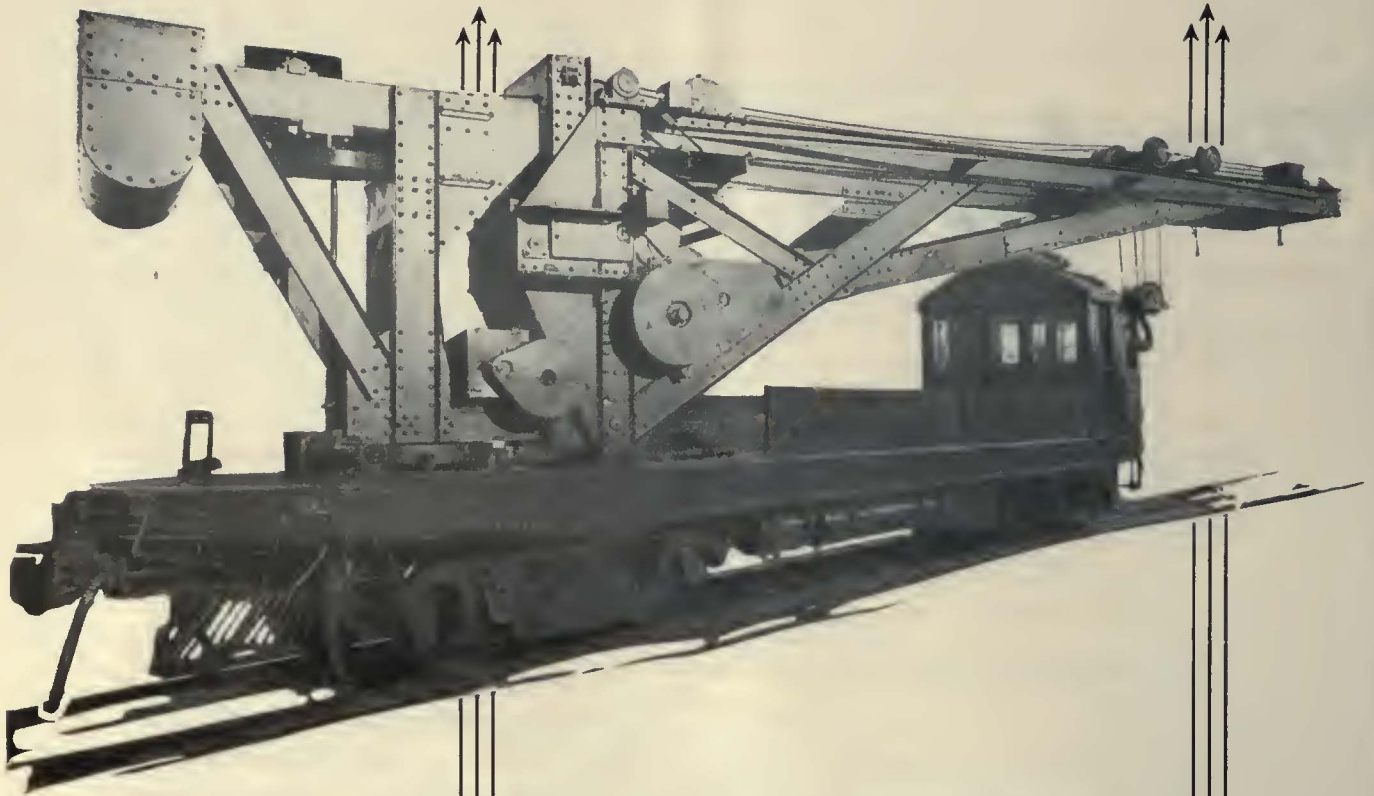
the top of the list for city service.

Increased patronage invariably rewards such service. And with it come the benefits of lower operating and maintenance costs inherent in truly modern, Brill-built cars.

Give the newspapers a chance also to carry the good news of increased earnings and dividend payments on the financial pages. It can be done—with new, efficient, modern Brill-built cars.

THE J. G. BRILL COMPANY
 PHILADELPHIA, PA.
 AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MAN'G CO.
 ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.





DERRICK cars like this, carrying heavy weights and subject to unusually severe service, require sturdy wheels.

“STANDARD” Rolled Steel Wheels are used on *this* Chicago, North Shore & Milwaukee work car.



Rolled Steel Wheels
 Quenched and Tempered
 Carbon Steel Axles
 Coil and Elliptic Springs

STANDARD STEEL

WORKS COMPANY
 PHILADELPHIA, PA.

BRANCH OFFICES:

CHICAGO	PORTLAND, ORE.	ST. PAUL, MINN.
ST. LOUIS	RICHMOND, VA.	PITTSBURGH, PA.
NEW YORK	SAN FRANCISCO	LOS ANGELES, CAL.
HOUSTON, TEXAS	BOSTON	MEXICO CITY, MEX.

WORKS: BURNHAM, PA.



*Have You
a Copy?*



Mail the
COUPON
NOW

Carnegie Steel Company has just issued a new revision of the booklet—"Steel Cross Ties." It is illustrated with photographs of interesting installations of street railway track and contains data of value to railway operators. Steel cross ties are now being used in practically all new work where economy and permanency are the chief considerations. If you are interested in "low-maintenance-cost" track, cut out the coupon and mail it today. There is, of course, no obligation involved.

Carnegie Steel Company
431 Carnegie Building,
Pittsburgh, Penna.

Send me a copy of your new
booklet—"Steel Cross Ties."

Name.....

Street.....

City.....

State.....

GOOD -

Just about Determines the

How much has the private auto cut into your traffic?

How much does it cost you to finance? Will your customers buy your stock?

Are the people for or against you in legal matters?

All this is important. All are largely matters of **GOOD-WILL**. Read on.



WILL

Earning Power of a Street Railway

IF people would rather ride your railway than any other transportation medium (including their own autos); if they thought well enough of it to buy stock when financing became necessary; and if they solidly supported you with their favorable opinion in legal matters; what a tremendous sum that would represent in good-will, and what an effect it would have on your balance sheet.

IN the cultivation of good-will quiet, smooth operation plays a most important part. People unconsciously come to approve a railway that is quiet and comfortable.

DAYTON TIES with their exclusive wood-block and asphalt cushion construction preserve indefinitely a smooth track surface by absorbing the shocks and vibration that would break down the track foundation. The vibration absorption also gives a noteworthy quietness of operation and keeps your rolling stock in better condition.

SERIOUS consideration of this will repay you many times. The value of good-will you will have to estimate yourself, but we will gladly furnish you with every detail of construction, cost, and service.



NEW RAILS AND TRACK MATERIALS



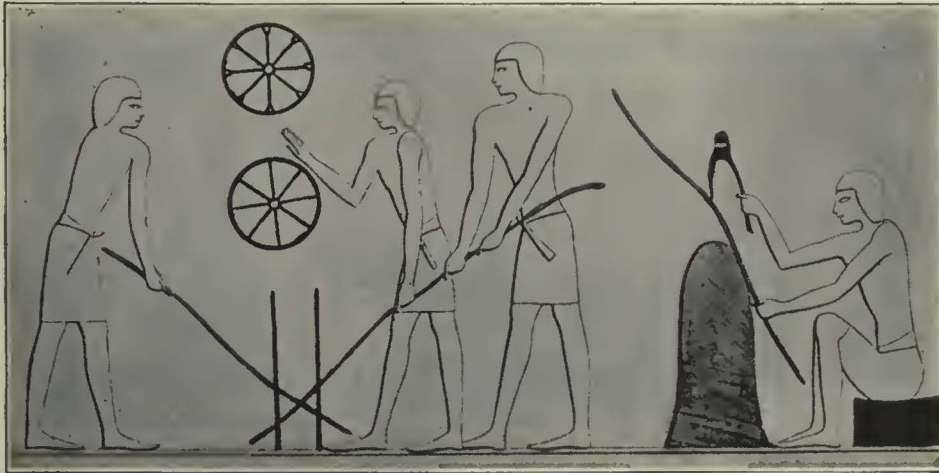
Foster Supplies regularly, New Steel Rails and Track Accessories for Complete Installations and for Repairs or Extensions, to many of the largest Electric Railroads in this country—with complete satisfaction as to QUALITY, SERVICE and GUARANTEE.

“PRICES,”—well, just ask for them—“1 Ton or 1,000.”

L · B · FOSTER COMPANY
PITTSBURGH · CHICAGO · NEW YORK

Who Invented the Wheel?

It is generally agreed by students of the history of civilization that that man did more for material progress than any other man could possibly have done. The wheel is the fundamental element in every vehicle of transportation.



Making Chariot Wheels in Egypt, about 1500 B.C.— From a tomb near Thebes

COST LESS
PER
TON MILE

THEY CARRY
A SERVICE
GUARANTEE

THE HARD
TREAD
AND
FLANGE
HAS A
MAXIMUM
WEARING
VALUE



CHILLED IRON WHEELS

HAVE KEPT PACE WITH
THE DEVELOPMENT OF
RAILROAD EQUIPMENT

The
Standard
Wheel
for
74
Years

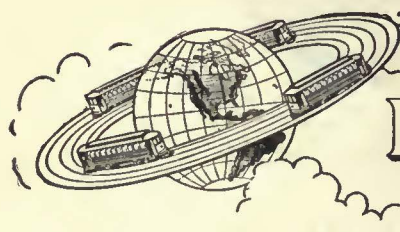
A.R.A. Standards

- 650 lb. Wheel for 30 Ton Cars
- 700 lb. Wheel for 40 Ton Cars
- 750 lb. Wheel for 50 Ton Cars
- 850 lb. Wheel for 70 Ton Cars

ASSOCIATION OF MANUFACTURERS
OF CHILLED CAR WHEELS
1847 McCormick Building
CHICAGO

50 Plants—Daily Capacities 20,000 Wheels

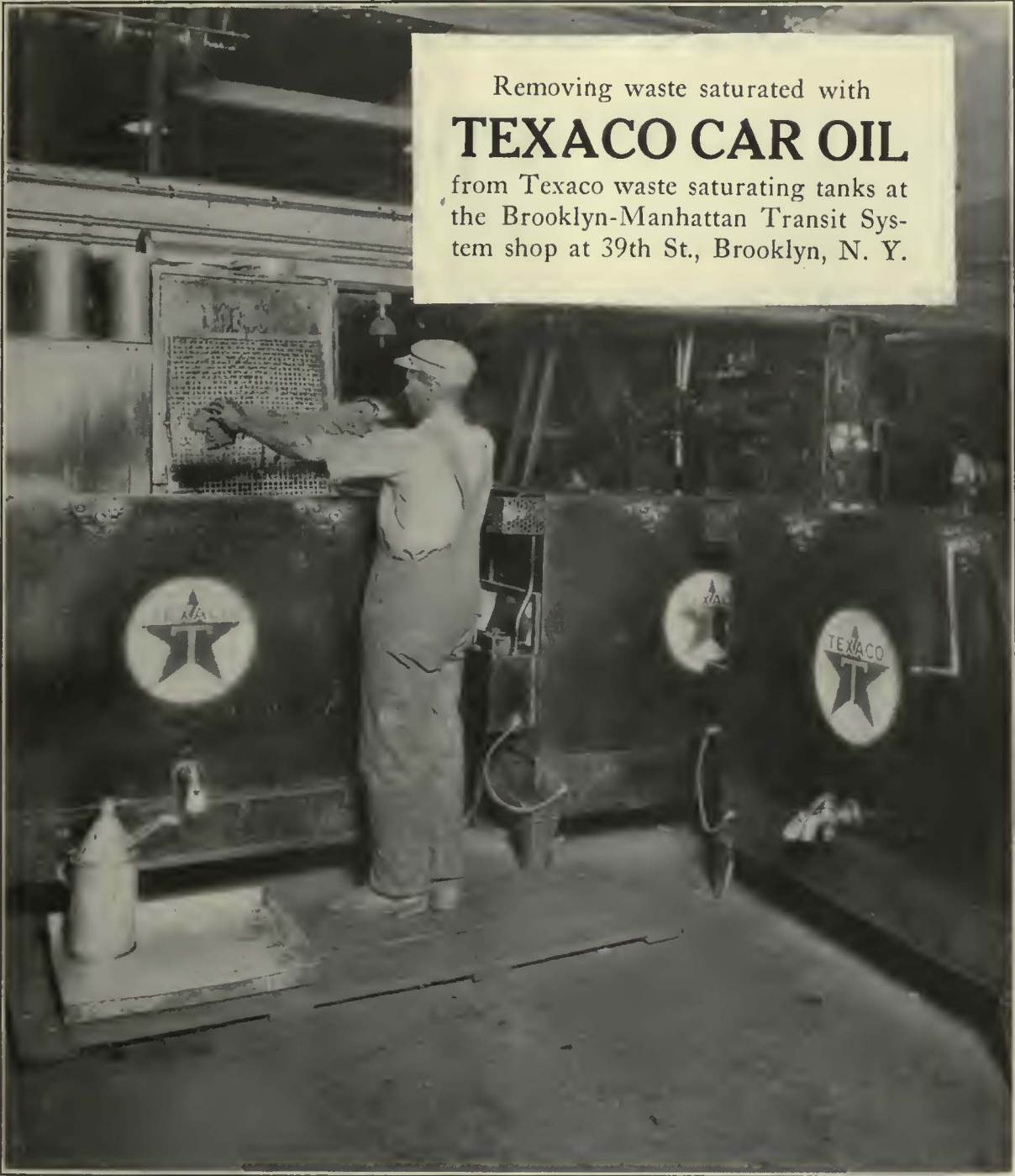
The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK



Removing waste saturated with
TEXACO CAR OIL

from Texaco waste saturating tanks at the Brooklyn-Manhattan Transit System shop at 39th St., Brooklyn, N. Y.

TEXACO



The Chosen Lubricant
of **ELECTRIC RAILWAYS**



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES

McGraw-Hill men studying your

HOW MANY TRAINED INVESTIGATORS

have you out in the field, gathering data on the industries which buy from you, studying the markets for your product from the standpoint of engineering fundamentals, sensing the coming shifts which may stimulate or depress your sales? . . . Perhaps not one!

But if you should walk through the great editorial rooms of the McGraw-Hill Publications any morning, you would see many vacant desks of men who are "out in the field," rubbing elbows with their industries, getting data on trends and money-saving practices. They are primarily in the readers' service, but the data they gather are necessarily the basis of sound selling to their several industries. They are, therefore, in your service as well as that of the reader.

The *American Machinist* editors are ever afield, gathering data, inspecting installations, studying operations and pointing the way to lower production costs through replacement of inefficient machinery.

Engineering News-Record editors four years ago started a campaign for winter construction to provide year-round contracts to the construction industry and ultimately reduce building costs. They have made frequent excursions to winter operations, bringing back to their publication and industry the facts regarding costs and benefits. Stability and expansion of the market for building equipment and supplies have already resulted.

Electrical World's editorial field investigations and statistical work have brought to central stations major policies and accurate data for the development of industrial heating and domestic load building, including refrigeration and cooking. On the other hand this service has supplied to electrical manufacturers accurate yardsticks for plotting sales quotas and future expansion. The public draws a by-product from this work in the form of (1) service at the same or lower rates, notwithstanding the increased cost of everything entering into the production of electricity; (2) extension of electric lines to isolated sections.

So with all McGraw-Hill Publications—editors leave their desks to discover and point the way toward bigger opportunity . . . *Power* editors are effectively crusading for increased boiler efficiency through better equipment . . . *Coal Age* editors are campaigning against obsolete methods in the mines and for cost-cutting machinery . . . *Bus Transportation* editors have helped to bring order out of chaos in this infant industry, which today covers twice the mileage of the nation's railways . . . In existence but a short year, *Radio Retailing* is bending every effort toward stabilizing and stimulating radio merchandising. Its costs studies on operating the four major types of stores and departments are the very first information of its kind in the radio field, paralleling the investigations made by McGraw-Hill in the general electrical merchandising field.

Each McGraw-Hill Publication lives the life and breathes the air of the industry it serves. Its experts are on the ground, getting first-hand information on the things they need to know to make the Publication the virile authority it is in its field. Through over fifty years of intimate contact such as this, the McGraw-Hill Publishing Company has acquired an unmatched knowledge of industry, a rich storehouse of information for the manufacturer who would sell to industry efficiently. This is the background out of which have come the McGraw-Hill Four Principles of Industrial Marketing.

The McGraw-Hill Publications

MINING
ENGINEERING & MINING JOURNAL-PRESS
COAL AGE

ELECTRICAL
ELECTRICAL WORLD JOURNAL OF ELECTRICITY
ELECTRICAL MERCHANDISING

INDUSTRIAL
AMERICAN MACHINIST INDUSTRIAL ENGINEER
CHEMICAL & METALLURGICAL ENGINEERING
POWER

CONSTRUCTION & CIVIL ENGINEERING
ENGINEERING NEWS-RECORD

TRANSPORTATION
ELECTRIC RAILWAY JOURNAL
BUS TRANSPORTATION

RADIO
RADIO RETAILING

OVERSEAS
INGENIERIA INTERNACIONAL
AMERICAN MACHINIST
(European Edition)

DIRECTORIES & CATALOGS
CENTRAL STATION DIRECTORY COAL CATALOG
ELECTRIC RAILWAY DIRECTORY
EMF ELECTRICAL YEAR BOOK
RADIO TRADE CATALOG
COAL FIELD DIRECTORY
KEYSTONE CATALOG KEystone CATALOG
(Coal Edition) (Metal-Quarry Edition)
ANALYSIS OF NON-METALLIC MINING, QUARRYING
AND CEMENT INDUSTRIES

are away markets



An Editorial floor and the mezzanine
New York Office
McGraw-Hill Publishing Company, Inc.

125 Editors drawn from industry and trade
542 Special News Correspondents
Editors travel 700,000 miles a year through industry
23,000 editorial pages printed yearly
10,000,000 copies of McGraw-Hill papers to 220,000 subscribers annually
Editorial offices located at 9 strategic centers

Sound, efficient sales effort in the field of Industrial Marketing must be based on these Four Principles:

Market Determination

An analysis of markets either by industries or buying groups such as "engineers" functioning through all industry.

Buying Habits

A study of the selected markets to determine which men in each industry are the controlling buying factors. Definite knowledge eliminates costly waste in sales effort.

Channels of Approach

Determination of the methods by which each market keeps in touch with developments and the employment of these methods as the channels of approach to these buyers. Proper use of these channels provides a balanced sales

promotion program, making most effective use of publication advertising, manufacturers' literature and exhibits.

Appeals that Influence

Determining the appeals that will present the product to the prospective buyer in terms of his own self-interest or needs.

These Four Principles of Industrial Marketing can be made a living force in your business. The goal of American industry today is to make distribution as efficient as production. If this is *your* goal, get in touch with the nearest McGraw-Hill office, or have your advertising agent do so and arrange for a personal discussion with McGraw-Hill Marketing Counselors, in your office or in ours.

McGraw-Hill Publishing Company, Inc., New York, Chicago, Philadelphia, Cleveland, St. Louis, San Francisco, London

McGraw-Hill Publications

45,000 Advertising Pages used Annually by 3,000 manufacturers to help Industry buy more effectively.

The first complete book on power-factor problems

A book you will want to have
Examine it for 10 days FREE.

Just Out!

POWER - FACTOR WASTES

By Charles R. Underhill
Consulting Electrical Engineer

326 pages, 6x9, illustrated, \$3.50 net, postpaid

This book gives you a complete and practical discussion of power-factor wastes, their costs, causes and cures. It brings together for the first time the facts and authoritative opinions about this long-standing electrical problem.

The book analyzes the use of electric power in relation to the work it is supposed to do and the work it actually does, and explains the methods which have proved successful in reducing the obvious wastes and losses. Every side of the power-factor question is given adequate attention—corrective measures and machines are thoroughly described—possible savings are shown by actual figures from plant operation.

Some special topics discussed:

- Symposium on the Power-Factor Situation.
- Fundamental Principles of Power-Factor and Its Correction.
- The Plant Distribution System, Power-Factor Correction with Fynn-Welchsel Motors.
- Improving Power-Factor with Electric Furnace.
- Status of Power-Factor Correction.

Examine the book FREE

The book presents the belief that low power factor is not a burden which the electrical industry and users of electric power must shoulder. You will be interested to know this book. Send for it to examine.

Mail just this coupon

Be sure to see this new book



McGraw-Hill FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York.
You may send me on 10 days' approval Underhill—Power-Factor Wastes, \$3.50 net, postpaid. I agree to remit for the book or to return it postpaid within 10 days of receipt.

Signed

Address

Official Position

Name of Company

(Books sent on approval to retail purchasers in U. S. and Canada only.) E 5-1-26

MAGNET WIRE SPECIFICATIONS



Trade Mark Registered

A SET OF STANDARDS DRAWN UP BY
THE AMERICAN ENGINEERING STANDARDS COMMITTEE

APPROVED AND ENDORSED BY
THE ACME WIRE CO.

GENERAL OFFICES AND FACTORY
NEW HAVEN, CONN., U. S. A.

BRANCH OFFICES
NEW YORK CHICAGO CLEVELAND BOSTON

This Specification

Should be in the hands of every manufacturer of electrical apparatus.

We will be glad to send a copy to any Engineer or Purchasing Agent who will write us for it.

Ask for Pamphlet No. 2-J.

THE ACME WIRE CO.

NEW HAVEN, CONN., U. S. A.

BRANCHES:
New York Chicago Cleveland Boston

ACME WIRE PRODUCTS

MAGNET WIRE COIL WINDINGS
ACME VARNISHED INSULATIONS

COMPRESSED TERMINAL RAIL BONDS



*150 lb. Third Rail Joint bonded with
4—450,000 c. m. U. S. B. Bonds.*

The above illustration shows an unusual view of four tangent tracks on the Long Island Railroad.

Compressed Terminal Third Rail Bonds made by the American Steel & Wire Company were selected for use on the heavily traveled extension to Babylon.

The permanence of the compressed terminal contact has been proven. Bonds placed in service during 1910 showed no increase in resistance when tested recently.

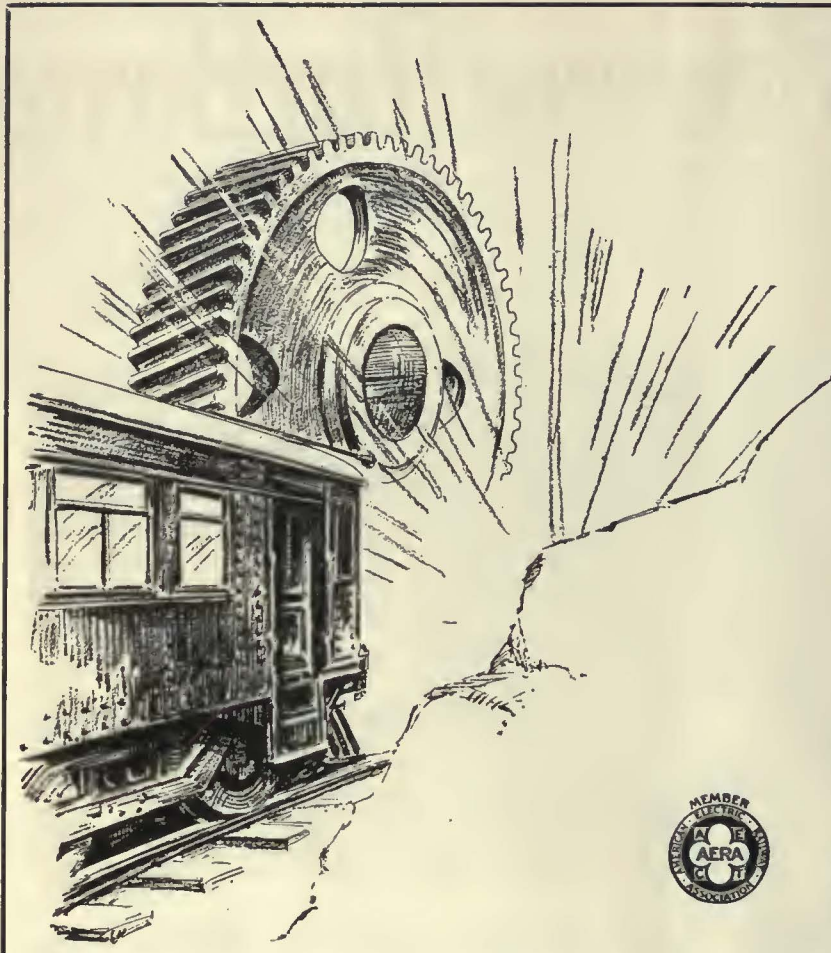
Specify American Steel & Wire Company's Third Rail Bonds.

MADE BY

AMERICAN STEEL & WIRE Company

Sales Offices:

Chicago New York Boston Cleveland Worcester Philadelphia Pittsburgh Buffalo Detroit Cincinnati Baltimore Wilkes-Barre St. Louis
 Kansas City St. Paul Oklahoma City Birmingham Memphis Dallas Atlanta Denver Salt Lake City
 Export Representative: U. S. Steel Products Co., New York
 Pacific Coast Representative: U. S. Steel Products Company, San Francisco, Los Angeles, Portland, Seattle



Nearly $\frac{3}{4}$ of a Million Miles and apparently good for a million

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Nuttall BP Helical Gears are saving most of their cost on many properties, just due to minimizing vibration.

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Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

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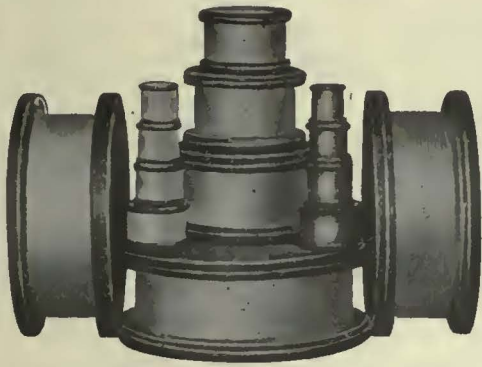
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Part Users—5 companies controlling 5971 cars.....35%	
Companies Testing—1 company controlling 1435 cars.....9%	
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Remember, the companies in this tabulation were selected by the A. E. R. A. as the live wires on equipment. They certainly know quality when it comes to gears.

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Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Air Springs
Cleveland Pneumatic Tool Co.

Anchor, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Asphalt Paint
American Asphalt Paint Co.

Automatic Return Switch
Stand
Ramapo Ajax Corp.

Automatic Safety Switch
Stands
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Standard Steel Works
Westinghouse Elec. & Mfg. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbit Metal
Johnson & Co., J. R.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols-Lintern Co.

Bearings and Bearing Metals
Brill Co., The J. H.
General Electric Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller
Side
Stuckl Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells and Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Track-work Co.

Bodies, Bus
Auto Body Co., The
Cummings Car & Coach Co.

Body Material, Haskellite & Plymet
Haskellite Mfg. Corp.

Bollers
Babcock & Wilcox Co., The

Boller Tubes
National Tube Co.

Bond Testers
Amer. Steel & Wire Co.
Elec. Service Supplies Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
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McGraw-Hill Book Co.

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Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Nat'l Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Brill Co., The J. G.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Westinghouse Elec. & M. Co.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskellite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Buses, Motor
Auto Body Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
International Motor Co.
Mack Trucks
White Co., The

Bus Seats
Hale-Kilburn Co.

Bushings, Case Hardened and Manganese
Brill Co., The J. G.

Cables
(See Wires and Cables)

Cambrie Tapes, Yellow & Black Varnish
Irriving Varnish & Ins. Co.

Cambrie Yellow & Black Varnish
Mica Insulator Co.

Carbon Brushes
(See Brushes, Carbon)

Car Lighting Apparatus
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse Elec. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co., Inc.

Cars, Gas Rail
Brill Co., The J. G.

Cars, Passenger, Freight Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Gray Iron and Steel
American Bridge Co.
Amer. Steel Foundries
Standard Steel Works
Wm. Wharton, Jr. & Co.

Catchers and Retrievers, Trolley
Earl, C. I.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskellite Mfg. Corp.
Pantastote Co., Inc., The
Ceilings, Plywood Panels
Haskellite Mfg. Corp.

Cement Accelerator
North American Cement Corp.

Change Carriers
Cleveland Fare Box Co.
Elec. Service Supplies Co.

Circuit Breakers
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables
Anderson Mfg. Co., A. M. & J. M.
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track
(See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.
Root Spring Scraper Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling
(See Conveying and Hoisting Machinery)

Coils, Armature and Field
General Electric Co.
Westinghouse Elec. & M. Co.

Coll Banding and Winding Machines
Electric Service Sup. Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

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Cleveland Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

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Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Wood Co., Chas. N.

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General Electric Co.

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Cameron Elec'l Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

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General Electric Co.
Westinghouse Tr. Br. Co.

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General Electric Co.
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Condenser Papers
Irriving Varnish & Ins. Co.

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Std. Underground Cable Co.

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Electric Service Supplies Co.
International Register Co.
Roebbing Sons Co., John A.
Samson Cordage Works

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Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

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American Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

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Electric Service Supply Co.

Cross Arms (See Brackets)

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Foundations
International Steel Tie Co.

Crossing Frogs and Switch
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Signals. (See Signal Systems, Highway Crossing)

Crossings, Track. (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

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Brill Co., The J. G.
Morton Mfg. Co.
Pantastote Co., Inc., The

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Electric Equipment Co.
Sachsenmaier Co., Geo.

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Electric Service Supplies Co.

Detective Service
Wah Service, Edward P.

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Consolidated Car Heating Co.

National Pneu. Co., Inc.

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General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.

Doors, Folding Vestibule
National Pneumatic Co., Inc.

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Electric Service Supplies Co.
Ohio Brass Co.

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Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

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Westinghouse E. & M. Co.

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Railway Track-work Co.

Electric Transmission Towers
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Railway Track-work Co.
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Rome Wire Co.

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Beeler, John A.
Buchanan & Layng
Bylesby & Co., H. M.
Drum & Co., A. L.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & De Lew
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood, Inc.
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White Eng. Corp., The J. G.

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Continental Motors Co.

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Consolidated Car Fender Co.
Root Spring Scraper Co.
Star Brass Works
Wood Co., Chas. N.

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Field Coils (See Coils)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Flaxinum Insulation
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Electric Service Sup. Co.

Floor, Sub
Haskellite Mfg. Corp.

Floors
Haskellite Mfg. Corp.

Forgings
Brill Co., The J. G.
Carnegie Steel Co.
Standard Steel Works

Frogs & Crossings, Ice Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track. (See Track Work)

Frogs, Trolley
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Melting
American Bridge Co.

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Brill Co., The J. G.

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General Electric Co.

Generators
English Electric Co.
General Electric Co.
Westinghouse Elec. & M. Co.

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Bethlehem Steel Co.
Lorain Steel Co., The
Gonga (See Bells and Gongs)

Greasers (See Lubricants)

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Metal & Thermit Corp.
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Railway Track-work Co.

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Harps, Trolley
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Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
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Heaters, Car, Stove
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This shoe does the work while your car is in service.

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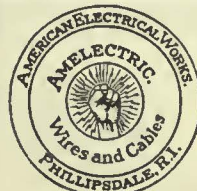
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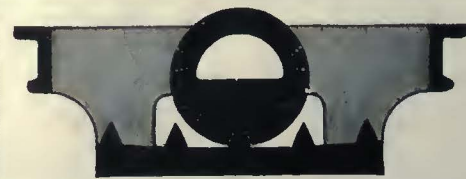


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			Una Welding & Bonding Co....
			Union Switch & Signal Co.....
			Universal Lubricating Co.....
			W
			"Want" Ads.....
			Wason Mfg. Co.....
			Westinghouse Elec. & Mfg. Co..
			West'gh'se Traction Brake Co..
			Wharton, Jr. & Co., Inc., Wm..
			"What and Where to Buy".....
			Wheel Truing Brake Shoe Co..
			White Eng. Corp., The J. G....
			White Co., The.....
			Wish Service, The P. Edw....
			Wood Co., Chas. N.....

WHAT AND WHERE TO BUY

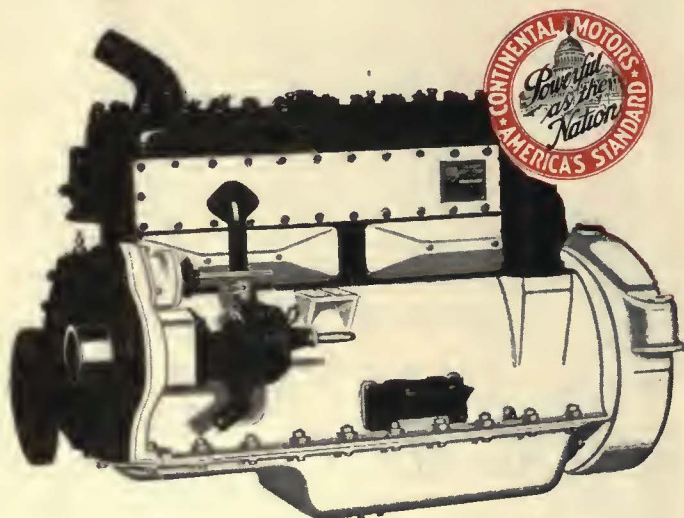
(Continued from page 52)

<p>Weatherproofing Morton Mfg. Co.</p> <p>Welded Rail Joints Electric Ry. Improvement Co. Lorain Steel Co. Metal & Thermit Corp. Ohio Brass Co. Railway Track-work Co. Una Welding & Bonding Co.</p> <p>Welders, Portable Electric Electric Ry. Imp. Co. Ohio Brass Co. Railway Track-work Co. Una Welding & Bonding Co. Westinghouse Elec. & Mfg. Co.</p> <p>Welders, Rail Joint Ohio Brass Co.</p>	<p>Welding Processes and Apparatus Elec. Ry. Improvement Co. General Electric Co. Metal & Thermit Corp. National Ry. Appliance Co. Ohio Brass Co. Railway Track-work Co. Una Welding & Bonding Co. Westinghouse E. & M. Co.</p> <p>Welding Steel Electric Ry. Improvement Co. Railway Track-work Co. Una Welding & Bonding Co.</p> <p>Welding Wire American Steel & Wire Co. General Electric Co. Railway Track-work Co. Roebling's Sons Co., John A.</p>	<p>Welding Wire and Rods Railway Track-work Co.</p> <p>Wheels, Car, Cast Iron Asso. of Mfrs. of Chilled Car Wheels</p> <p>Wheels, Car, Steel & Steel Tire American Steel Foundries Standard Steel Works</p> <p>Wheel Guards (See Fenders and Wheel Guards)</p> <p>Wheel Grinders Wheel Truing Brake Shoe Co.</p> <p>Wheel Presses (See Machice Tools)</p>	<p>Wheels, Trolley Electric Ry. Equip. Co. Elec. Service Supplies Co. General Electric Co. Nuttall Co., R. D. Star Brass Works</p> <p>Wheels, Wrought Steel Carnegie Steel Co. Ludlum Steel Co.</p> <p>Whistles, Air General Electric Co. Ohio Brass Co. Westinghouse Air Brake Co. Westinghouse Elec. & Mfg. Co.</p> <p>Windows, Sash, Locks and Raeks Morton Mfg. Co.</p>	<p>Wire Rope Amer. Steel & Wire Co. Roebling's Sons Co., J. A.</p> <p>Wires and Cables Acme Wire Co., The American Brass Co., The Amer. Electrical Works Amer. Steel & Wire Co. Anaconda Copper Min. Co. General Electric Co. Okonite Co. Okonite-Callender Cable Co. Inc. Roebling's Sons Co., J. A. Rome Wire Co. Standard Underground Cable Co. Westinghouse E. & M. Co.</p>
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Continental*

Making the Grade



On the long climb or the steep hill the bus equipped with a Continental Motor has that reserve power which enables it to make the grade and arrive on schedule.

Continuous, unfailing performance is a characteristic of all Continental motors. And 25 years specialization in motor building with an output exceeding 2,750,000 power units is the user's assurance of dependable, economical power.

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Easily and quickly operated.

Increased Seating Capacity

Improved Public Relations

Adapted to both end and center platforms of cars equipped with either slat or upholstered seats.



Separates incoming and outgoing passengers at service doors.

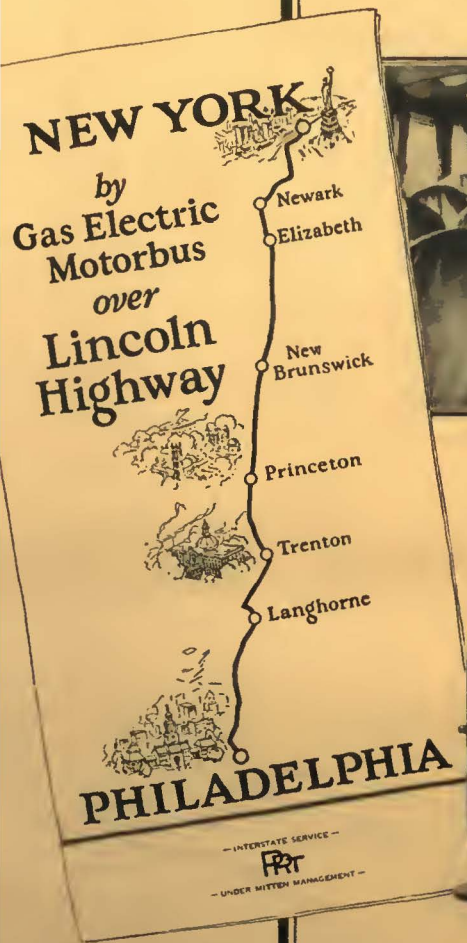
The Brill "Admor" Seat (patented) makes it possible to utilize the space in front of non-operating platform doors for additional seating accommodations. Brooklyn City Railroad with 535 cars equipped, Asheville Power & Light

Company, City of Miami, The Washington Railway & Electric Co. on its 15 new cars, and the Chilian Electric Co. of Santiago on 30 cars now building have already taken advantage of its facilities. Further details furnished upon request.


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 PHILADELPHIA, PA.
 AMERICAN CAR CO. — G. C. KUHLMAN CAR CO. — WASON MAN'G CO.
 ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.

Parlor Gas-Electrics on 100-mile interurban run

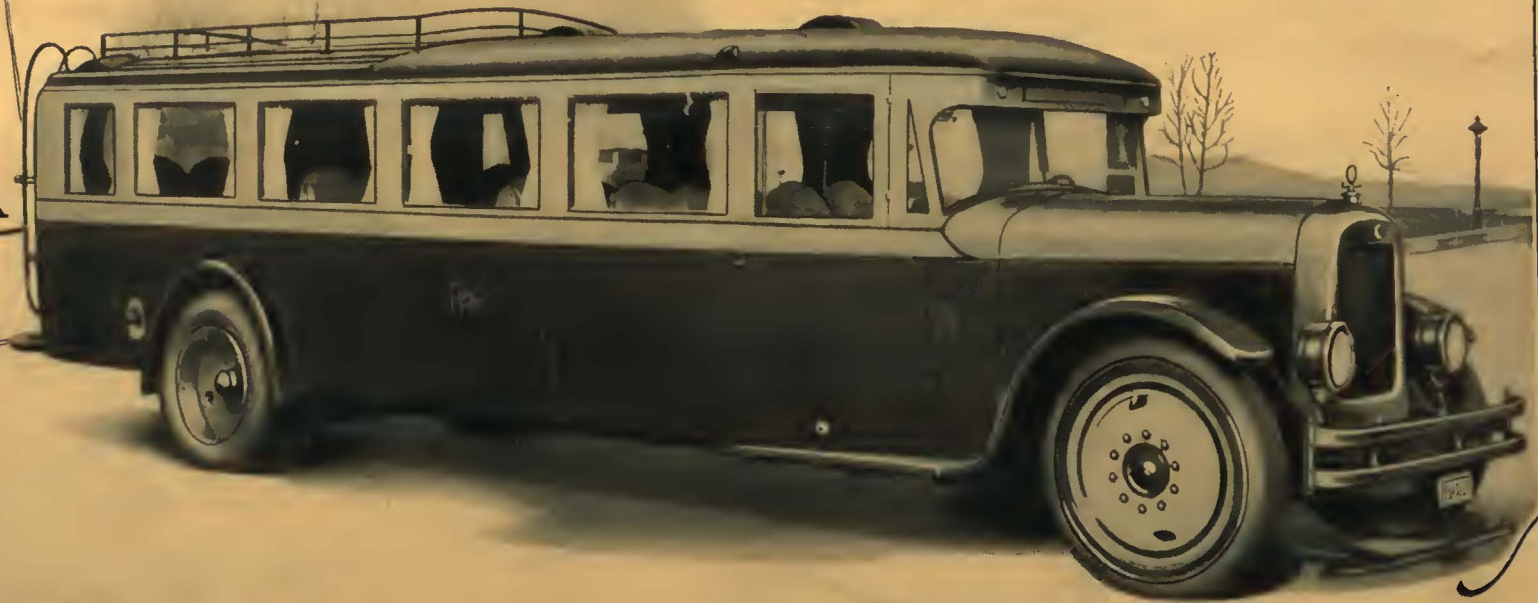


Transportation by bus progressed another step when the Philadelphia Rural Transit Company extended the scope of its already wide-spread activities to include a properly-organized, well-equipped service between Philadelphia and New York.

A significant fact is that P. R. T.'s extensive experience with G-E Gas-Electric Drive on buses in urban service was so satisfactory that this same type of equipment was selected for the new inter-city enterprise.

This company has three other inter-urban bus routes—Philadelphia to Atlantic City, Philadelphia to Trenton, and Philadelphia to Wilmington—also operated with gas-electric buses, G-E equipped. By reason of its experience with gas-electric drive in interurban service, it has ordered 25 additional equipments.

No progressive transportation company today can afford to overlook the demonstrated operating and maintenance advantages of Gas-Electric Drive (for buses and trucks).



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