

Annual Statistical Number

# ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc.

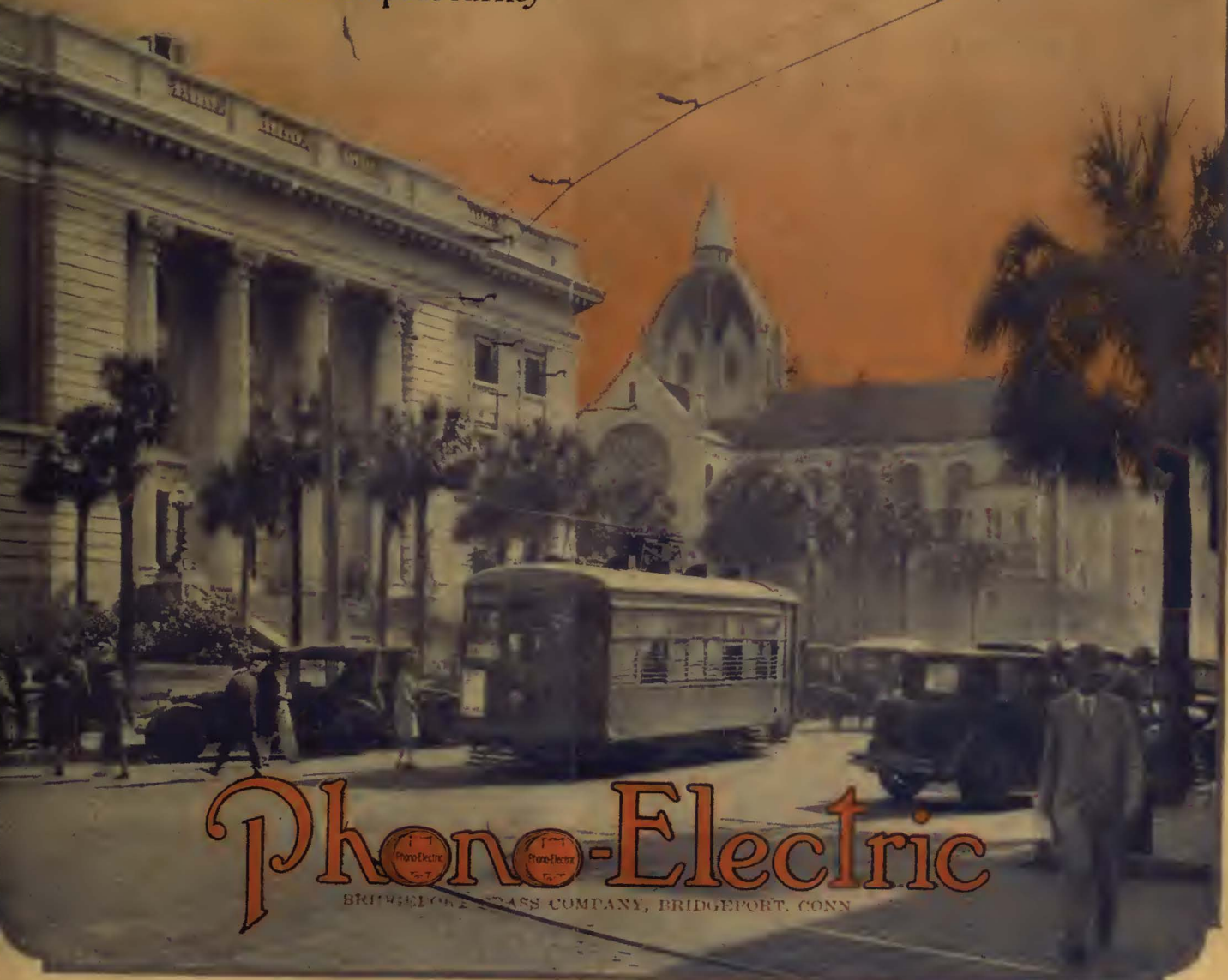
January 2, 1926

Twenty Cents per Copy

*The sun never  
sets on*

**“Bridgeport”**  
BRASS  
TRADE CO. MARK  
**Phono-Electric**

*See Advertisement inside  
“From Tampa To Turkey”*



**Phono-Electric**  
BRIDGEPORT BRASS COMPANY, BRIDGEPORT, CONN.

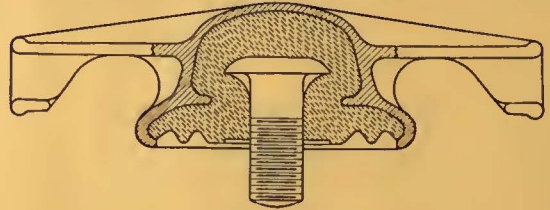
Tampa, Florida



# Suspensions



Westinghouse B Suspension  
Styles 227032 and 227037  
Straight Line



Showing method of holding stud  
in body of B suspensions with  
special insulating compound



Westinghouse B Suspension  
Style 227144—Single-Curve with Arm



Westinghouse B Suspension  
Style 227146—Double-Curve with Arms



Westinghouse B-1 Suspension  
Style 300814, Straight-Line

## Special Westinghouse Insulating Compound

holds the forged steel stud in the malleable iron body of Westinghouse B Suspensions.

The B-1 is identical with the B Straight-Line Suspension except that the stud is longer and is fitted with a lock washer held by a thin copper washer. This enables the trolley ear to be aligned accurately without "backing it off the stud," thereby always assuring a tight connection between the suspension and the ear. The lock washer will not become loose. The copper washer prevents the point of the lock washer from digging into the boss of the trolley ear, when removing the ear.

Westinghouse Electric & Manufacturing Company  
East Pittsburgh Pennsylvania  
Sales Offices in All Principal Cities of  
the United States and Foreign Countries



1926

# Westinghouse

X 85768



JOHN A. DEWHURST  
Associate Editor

JOHN A. MILLER, JR.  
Associate Editor

CLARENCE W. SQUIER  
Associate Editor

GEORGE J. MACMURRAY  
News Editor

EDWIN F. THAYER  
Assistant Editor

# ELECTRIC RAILWAY JOURNAL

MORRIS BUCK, *Managing Editor*

FRY W. BLAKE  
Senior Editor

CARL W. STOCKS  
Associate Editor

A. W. ALLEN  
Assistant Editor -  
San Francisco

PAUL WOOTON  
Washington Correspondent

ALEX McCALLUM  
Editorial Representative  
London, England

Vol. 67  
No. 1

## CONTENTS

Pages  
1-54

January 2, 1926

Editorials .....	1
Railways Plan to Spend \$296,000,000 for Plant and Material in 1926 .....	5
Purchasing power of the industry shows healthy progress. An increase of 11.66 per cent over last year's figures is promised. Large track construction program is included in estimate submitted by the 57 operating companies furnishing information.	
Fiction Has Nothing on These Facts! .....	7
By G. J. MACMURRAY. Suppose you went to the door to answer the bell and found a conductor instead of a cop, what would you say? A science of transportation is being developed. If you don't believe it you are out of touch with the events of the industry during 1925.	
Issues of Merit Easy to Sell .....	13
Total financing in 1925 not large compared with recent years, but companies with good operating records experienced no difficulty in finding a market for their issues at reasonable rates. Need is imperative for recasting many financial structures.	
Track Extensions Show Substantial Gain Over Previous Years .....	15
Electric railway mileage added during the past twelve months is larger than in any other year since 1913. Extensions to city and interurban trackage show increases over 1924. More than twice as much steam railroad mileage was electrified.	
Car Purchases During 1925 Were Below Requirements .....	19
Reduction in the number of new cars ordered this year emphasizes the importance of directing increased attention to replacement of obsolete equipment. New England was the only section reporting increased purchases over last year.	
34 per Cent of Passenger Cars Are Over Twenty Years Old .....	25
Less than half of all cars now in electric railway service were purchased in the last fifteen years. Greater number of new cars are needed to modernize industry than was anticipated. Nationwide survey more than confirms previous estimates.	
Heavy Traction Progress in 1925 .....	28
Many projects completed, both in this country and abroad. Increasing attention is being paid to electric operation on trunk lines.	
Bus Operation by Electric Railways Broke All Records in 1925 .....	29
More companies inaugurated bus service during the past twelve months than in any previous year. The number of buses operated more than doubled. Purchases of new equipment were greater than ever before.	
Electric Railway Costs and Fares Continue Stable in 1925 .....	37
By ALBERT S. RICHEY. Only a few points variation has occurred in major index figures during the year. Discussion of trends indicates stability for coming year. Several changes in method of computing figures.	
Receiverships Reduced in 1925 .....	41
Fewer roads were thrown in receivership during the year, although the failure of one large property increased the mileage over that in 1924. Many roads restored to their owners, while others are on the way to terminate receivership early this year.	
News of the Industry .....	44
Recent Bus Developments .....	47
Financial and Corporate .....	48
Personal Mention .....	50
Manufactures and the Markets .....	51

## We Thank You!

ONCE more a new year is dawning. With it comes another Annual Statistical Number, with a wealth of information regarding the doings of electric railways in the past year, and a forecast of the one just begun. Collection of this material has been the main work of the editors ever since the October convention. The information this year is believed to be more complete, more accurate and more authoritative than ever before.

The editors alone could not have produced this issue. It has taken the assistance of practically every operating railway and holding company, and the manufacturers as well, to supply the information on which the tables, charts and text are based. Thousands of letters and hundreds of telegrams have been sent out and replies received in the process of collecting and verifying the data. Manifestly it is impossible to send acknowledgment in each individual case.

The data presented will be of inestimable value to the industry. We are glad to have been of service in preparing and publishing it. And we desire to thank publicly all who have assisted us in the preparation of this issue.

And to each one in the industry let us express the wish that for you it will be a happy and a prosperous New Year.

### McGRAW-HILL COMPANY, INC.

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

Cable Address: "Mechinist, N. Y."

JAMES H. MCGRAW, President  
ARTHUR J. BALDWIN, Vice-President  
MALCOLM MUIR, Vice-President  
EDWARD J. MERRIN, Vice-President  
MASON BRITTON, Vice-President  
JAMES H. MCGRAW, JR., Vice-Pres. and Treas.  
C. H. THOMPSON, Secretary

Publishers of  
*Engineering News-Record*  
*American Machinist*

*Power*  
*Chemical and Metallurgical Engineering*  
*Coal Age*

*Engineering and Mining Journal-Press*  
*Ingenieria Internacional*  
*Bus Transportation*

*Electric Railway Journal*  
*Electrical World*  
*Electrical Merchandising*

*Radio Retailing*  
*Journal of Electricity*  
(Published in San Francisco)

*Industrial Engineer*  
(Published in Chicago)  
*American Machinist—European Edition*  
(Published in London)

WASHINGTON:  
Colorado Building  
CHICAGO:  
7 S. Dearborn Street  
PHILADELPHIA:  
Real Estate Trust Building  
CLEVELAND:  
401 Guardian Building  
ST. LOUIS:  
Star Building  
SAN FRANCISCO:  
833 Mission Street  
LONDON:  
6 Bouverie Street, London, E. C. 4



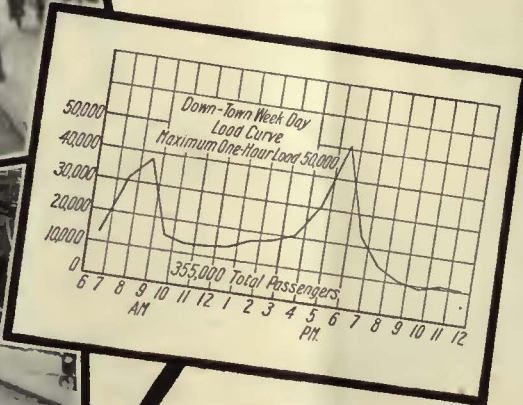
Member Associated Business Papers, Inc.  
Member Audit Bureau of Circulations

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 29 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, 1926, by McGraw-Hill Company, Inc. Published weekly. Entered as second-class matter, June 23, 1905, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.



# Pittsburgh Promotes Progress



The Pittsburgh Railways designed the first Light-Weight, Low-Wheel, High-Speed Electric Street Car.

The Pittsburgh Railways are retiring obsolete cars at a rapid rate and placing in operation new standardized modern cars.

The latest type of Pittsburgh street car may be operated singly, with one or two men, or in trains as traffic conditions require.

Superior transportation service is afforded Pittsburgh patrons, with the highest operating efficiency.



World Series Base Ball  
30,000 passengers moved  
after the game in 27 minutes



The illustrations prove that this service is appreciated and utilized by Pittsburghers daily, for business, and for pleasure.



Pittsburgh Railways Street Cars  
transport foot-ball crowds  
safely and promptly

Three thousand Westinghouse No. 514 Low-Wheel Motors are in daily service on Pittsburgh Street Cars.



Westinghouse Electric & Manufacturing Company  
East Pittsburgh Pennsylvania  
Sales Offices in All Principal Cities of the  
United States and Foreign Countries



No. 514 Railway Motor



# Westinghouse





Double Track Reconstruction, Lancaster Ave., Reading, Pa.

## Steel and Concrete *Co-operate* in Twin Tie Track

**T**WIN Tie Track is a uniform structure, steel having nearly the same coefficient of expansion as concrete. How much more efficient than that type of track foundation in which more concrete and ballast merely produces a hybrid design in which wood divides the paving foundation into 16-inch blocks (the distance between wood ties).

If Twin Tie Track cost more initially than such construction there might be some reason for overlooking its ultimate advantage. *But the first cost is less!*

We are now offering cost figures collected during the past season. *May we send them to you with a quotation on Twin Ties?*

The International Steel Tie Co.  
Cleveland, Ohio

# Steel Twin Tie Track

Renewable Track . . . Permanent Foundation



---

SAVING THE RAIL SAVES THE RAILWAY

---

# Popularizing Electric Railway Transportation

From a paper presented at a meeting of the  
Mid-West Electric Railway Association,  
Wichita, Kan., Nov. 30, 1925:

“Before we can make our service popular we must make it good. The comfort and convenience of passengers must come first. A well-built, well-maintained track is essential, one that will furnish as smooth and quiet a ride as is possible to give. A bumpy, noisy track with low joints and bad pavement will not make us popular with those who ride the street cars, those who use the streets, or those who live or have their business on them. A bad crossing will bring down the anathemas of every automobilist who crosses, and he is the customer for whom we are gunning.”

By F. G. BUFFE  
Gen. Mgr. for Receivers  
KANSAS CITY RAILWAYS

And here is the equipment that makes  
“well-maintained track” easy to own.

## Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

Chester F. Gallor, 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

726



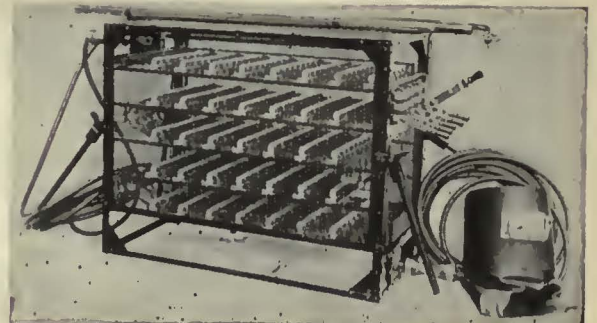
Reciprocating Track Grinder



"Atlas" Rail Grinder



"Imperial" Track Grinder



"Ajax" Electric Arc Welder

---

SAVING THE RAIL SAVES THE RAILWAY

---





## Route—1926 Destination—PROSPERITY

Definite indications point to a revival of prosperity for the electric railways. Confidence in the established transportation systems has been restored. The determination to furnish *modern* transportation with *really modern equipment*, has been increasingly evident since the Convention.

Now that a New Year is here, let's go ahead with those plans for new cars. And where they fit in the general scheme, let's add new buses, too. In either case, attracting more passengers and reducing expenses is the primary object. Signs, headlights, lighting fixtures, etc. can help materially if proper selection is made.



### ELECTRIC SERVICE SUPPLIES Co.

<b>PHILADELPHIA</b> 17th and Cambria Sts.	<b>NEW YORK</b> 50 Church St.	<b>CHICAGO</b> Illinois Merchants' Bank Bldg.
<b>PITTSBURGH</b> 839 Oliver Building	<b>BOSTON</b> 88 Broad Street	<b>SCRANTON</b> 316 N. Washington Ave.
<b>DETROIT</b> General Motors Building		

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



#### KEYSTONE CAR EQUIPMENT

- Faraday Stop Signal Systems
- Illuminated Destination Signs
- Steel Gear Cases
- Motormen's Seats
- Lighting Fixtures
- Golden Glow Headlights
- Headlight Resistances
- Air Sanders
- Trolley Catchers
- Shelby Trolley Poles
- Rotary Gongs
- International Fare Registers
- Fare Register Fittings
- Samson Cordage
- Air Valves

- Cord Connectors
- Trailer Connectors
- Automatic Door Signals
- Standard Trolley Harps
- Standard Trolley Wheels
- Peerless Coil Winding Tools
- Peerless Armature Machines
- Insulating Materials
- Cass Commutator Stones
- Sand Driers
- Peerless Pinion Pullers
- Employees' Badges
- Line Material
- Portable Lamp Guards

#### BUS EQUIPMENT

- Hunter Illuminated Signs
- Faraday Bells and Buzzers
- Faraday Push Buttons
- Golden Glow Bus Headlights
- Keystone Bus Lighting Fixtures
- Employees' Badges
- Fare Registers
- Hunter Bus Ventilators
- Keystone Bus Ventilators
- "Storm King" Windshield Cleaners



# Control!

## Safety Car Devices

*Our wish  
for you—*  
A PROSPEROUS  
NEW YEAR



## For your 1926 Cars

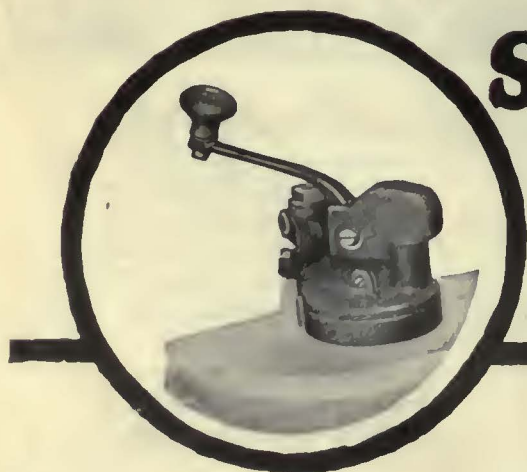
A general feeling of satisfaction will follow a more widespread use of Safety Cars during the coming year.

Those who run the cars will be benefited by a less arduous and more interesting job.

Those who ride the cars will be benefited by safer and better service.

Those who own the cars will be benefited by greater profits due to increased revenue and decreased operating expense.

Past performance on 13,000 cars is the basis of this prediction.



# SAFETY CAR DEVICES CO.

OF ST. LOUIS, MO.

*Postal and Telegraphic Address:*

## WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



# BRAKES!

## Variable Load

Our wish  
for you—  
a prosperous  
NEW YEAR



## For Your 1926 Cars

During the coming year many traction properties will modernize and improve their city service by using up-to-date light weight cars of high carrying capacity.

If the ordinary type of brakes are used, the stopping ability of such cars, having a high ratio of live to dead weight, will be diminished as the car load increases.

The Westinghouse Variable Load Brake, however, insures uniform stopping distance with light and loaded cars, by automatically adjusting the brake cylinder pressure. This helps to speed up traffic movement, and is a valuable asset in congested city service.



**WESTINGHOUSE TRACTION BRAKE CO.**  
General Office and Works: WILMERDING, PA.

# WESTINGHOUSE TRACTION BRAKES



# 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?



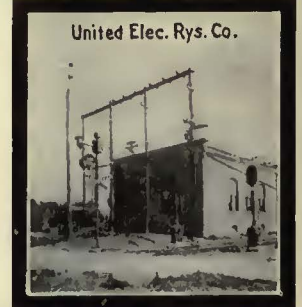
1.—Automatic semaphore or color light block signals, controlled by continuous track circuits.



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.

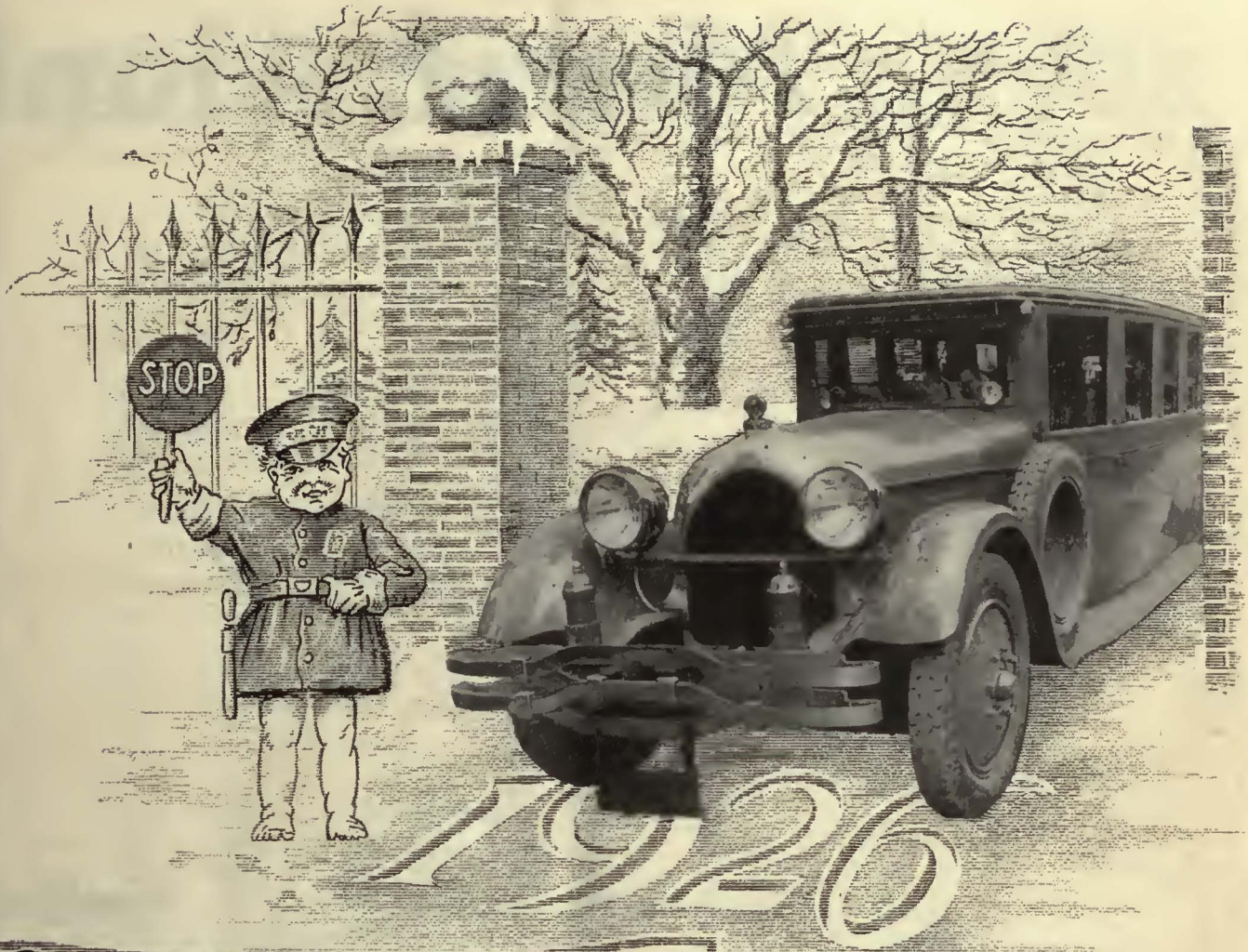


# Union Switch & Signal Co.



SWISSVALE, PA.





# New Year's Greeting

As we motor across the threshold of another New Year, we wish for all our friends in the bus transportation field another twelve months of prosperity, and hope for an opportunity to aid in its attainment.

The Westinghouse Air Brake, long recognized as an essential economic factor in transportation by rail, is now proving to be a safety and time-saving device for automotive vehicles which has the potentiality to vitally assist highway transportation in attaining its rightful place of usefulness and efficiency.

**WESTINGHOUSE TRACTION BRAKE CO.**

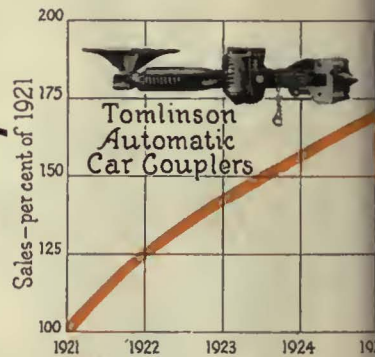
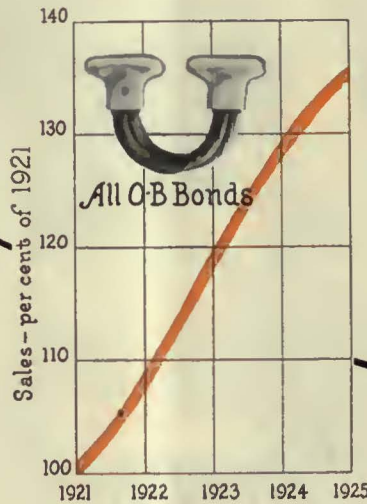
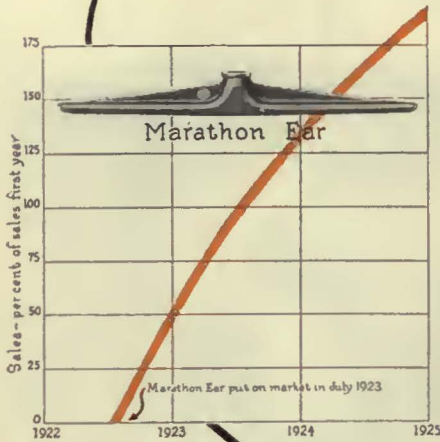
*Automotive Division*  
 Wilmerding, Pa.

**WESTINGHOUSE**  
*Automotive AIR BRAKES*





# Merit Alone



- Porcelain Insulators
- Trolley Materials
- Rail Bonds
- Electric Railway Car Equipment
- Mining Materials
- Valves

# Ohio



# Draws Such Curves

The trade writes a story. A digest of it appears in these curves.

To review it is to say that in the genuine merit of O-B products lies proof of the economies found by the users—economies measured in service.

No other cause could continue the ascension of these curves.

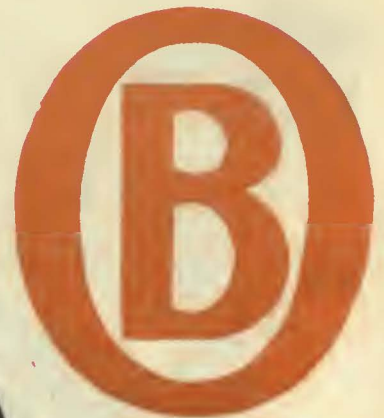
The trend here shown is representative. It has continued through the 36 years of O-B existence. It applies to O-B products all along the line in every industry served.

The story expresses recognition earned on the basis of a continuing determination to make the best materials and equipment that organization, facilities and capital can produce.

Merit alone draws such curves.

**The Ohio Brass Company**  
Mansfield, Ohio

In Canada - Dominion Insulator & Mfg. Co., Limited - Niagara Falls, Ont.



# O Brass



# GRAHAM BROTHERS MOTOR COACHES

Are contributing towards the co-ordination of transportation facilities by many Street Railways or their Bus Operating Subsidiaries. Among these companies are the following:

North Carolina Public Service Co.  
South Carolina Gas & Electric Co.  
Oklahoma Railway Co.  
Fort Dodge, Des Moines & Southern Ry. Co.  
Springfield Traction Co.  
Iowa Southern Utilities Co.  
Roanoke Railway & Electric Co.  
Washington Railway & Electric Co.  
Department of Street Railways (Detroit)  
Jamestown Street Railway Co.  
Auburn & Syracuse Railroad Co.  
Rochester & Syracuse Railroad Co.  
Altoona & Logan Valley Traction Co.  
Southern Penna. Traction Co.

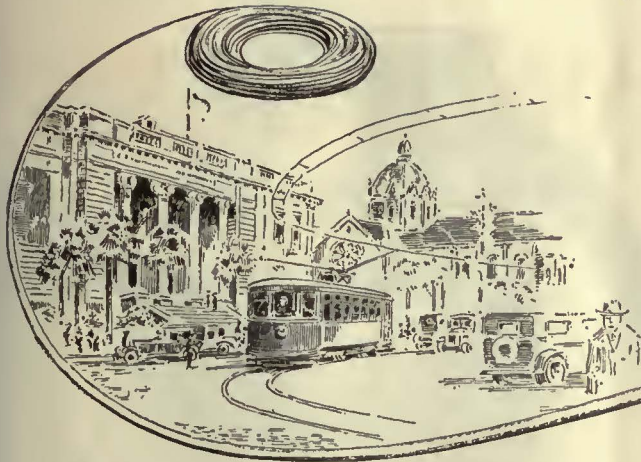
Wilmington & Philadelphia Traction Co.  
Chicago & Joliet Elec. Ry. Co.  
Texas Electric Railway  
Denver Tramway Co.  
Public Service Transportation Co.  
Hartford & Springfield Street Ry. Co.  
Savannah Elec. Light & Power Co.  
Kansas City Railways  
Tucson Rapid Transit  
Iowa Railway & Light Co.  
Gardner & Templeton St. Ry. Co.  
Washington & Old Dominion Ry.  
New Orleans Public Service Co.  
Southern Indiana Gas & Elec. Co.

## GRAHAM BROTHERS

Evansville - DETROIT - Stockholm  
A DIVISION OF DODGE BROTHERS INC.  
GRAHAM BROTHERS (CANADA) LIMITED - TORONTO, ONTARIO







# From Tampa to Turkey

**A**S FAR apart in appearance, customs and habits of thought as they are in distance! They don't even speak the same language! Yet in Constantinople, the capital of Turkey, as in Tampa, the winter Paradise of America, they say the same thing when it comes to long-life trolley—*Phono-Electric!*

Phono-Electric knows no geographical limits. As shown by the partial list at the right, this quadruple-wear wire is installed on prominent electric railways everywhere. Europe, Africa and even Australia know it and use it.



**BRASS**  
**“Bridgeport”**  
 TRADE MARK  
**Phono-Electric**  
*Everywhere!*

**UNITED STATES**  
 Used by over one hundred electric railway systems in city, interurban and electrified steam road service.

- ENGLAND**  
 Liverpool Corporation Tramways  
 Hull Corporation Tramways  
 Oldham Corporation Tramways  
 Birkenhead Corporation Tramways  
 Norwich Corporation Tramways  
 Walsall Corporation Tramways  
 Bexley Corporation Tramways  
 Maidstone Corporation Tramways  
 Blackpool Corporation Tramways  
 Sheffield Corporation Tramways  
 West Ham Corporation Tramways  
 Southampton Corporation Tramways  
 Rochdale Corporation Tramways  
 Swindon Corporation Tramways  
 Bournemouth Corporation Tramways  
 Wolverhampton Corporation Tramways  
 Hastings Tramways Company  
 London United Tramways Co.  
 Isle of Thanet Tramways Co.  
 Norwich Electric Tramways Co.  
 Bristol Tramways & Carriage Co.

- IRELAND**  
 Belfast City Tramways  
 Dublin United Tramways  
 Cork Electric Tramways Co.

- SCOTLAND**  
 Glasgow Corporation Tramways  
 Edinburgh Corporation Tramways  
 Ayr Corporation Tramways

- WALES**  
 Cardiff  
**PORTUGAL**  
 Lisbon Tramways

- AUSTRALIA**  
 Adelaide Municipal Tramways Trust, Adelaide  
 Brisbane Electric Tramways, Brisbane  
 Victoria Railways, Melbourne

- BELGIUM**  
 Tramways Bruxellois, Brussels  
**BUENOS AIRES, S. A.**  
 Buenos-Aires Tramways  
**CAIRO, EGYPT**  
 The Cairo Electric and Heliopolis Oases  
**CONSTANTINOPLE**  
 Constantinople Tramways and Electricite  
**NANTES, FRANCE**  
 Cie. des Tramway de Nantes  
**LYON, FRANCE**  
 Cie. des Omnibus et Tramways de Lyon

**Bridgeport**  
 Brass Company  
 BRIDGEPORT - CONNECTICUT



**Phono-Electric**

Bulletin just off the press awaits your request





Looking Toward  
Rotunda Effect at Rear



Glimpses of the  
Mack Parlor Car Bus  
from within



Looking  
Forward







The Bus  
as you buy it—

# An "exquisite" job!—

## THE MACK PARLOR CAR BUS

*One word defines the MACK Parlor Car Bus—EXQUISITE*

It is a word that may be coupled with the sturdy Mack design, and yet lose nothing by association, for in the Mack Parlor Car Bus beauty of correct line and proportion blend with sturdy construction to produce a real achievement.

In the presentation of this Mack job, it is only natural that the oldest chassis builder should join with the oldest body builder; each giving the ultimate of engineering skill and long experience. The result is apparent to passengers and owners. For luxury and security—for smooth, swift and steady roadability and high-class distinguished appearance—the Mack is in a distinct class. Passengers seated as luxuriously as they are in the Mack Parlor Car Bus, and surrounded on every side by beautiful appointments contributing toward their comfort, become satisfied patrons and steady riders.

Free from garish ornamentation which quickly becomes stale, inviting in every detail, economical to drive and maintain, the Mack represents the last word in modern Parlor Car design and manufacture. All the famous Mack ruggedness plus distinctive grace and beauty, are at your disposal, ready to keep your Mack *on the road* and increase your passenger fare revenue.

Write for the new Mack Catalog No. 93, which pictures and describes this "Exquisite job" in detail.

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

Ninety-five direct MACK factory branches operate under the titles of: "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION," "MACK MOTOR TRUCK COMPANY," and "MACK TRUCKS of CANADA, Ltd."

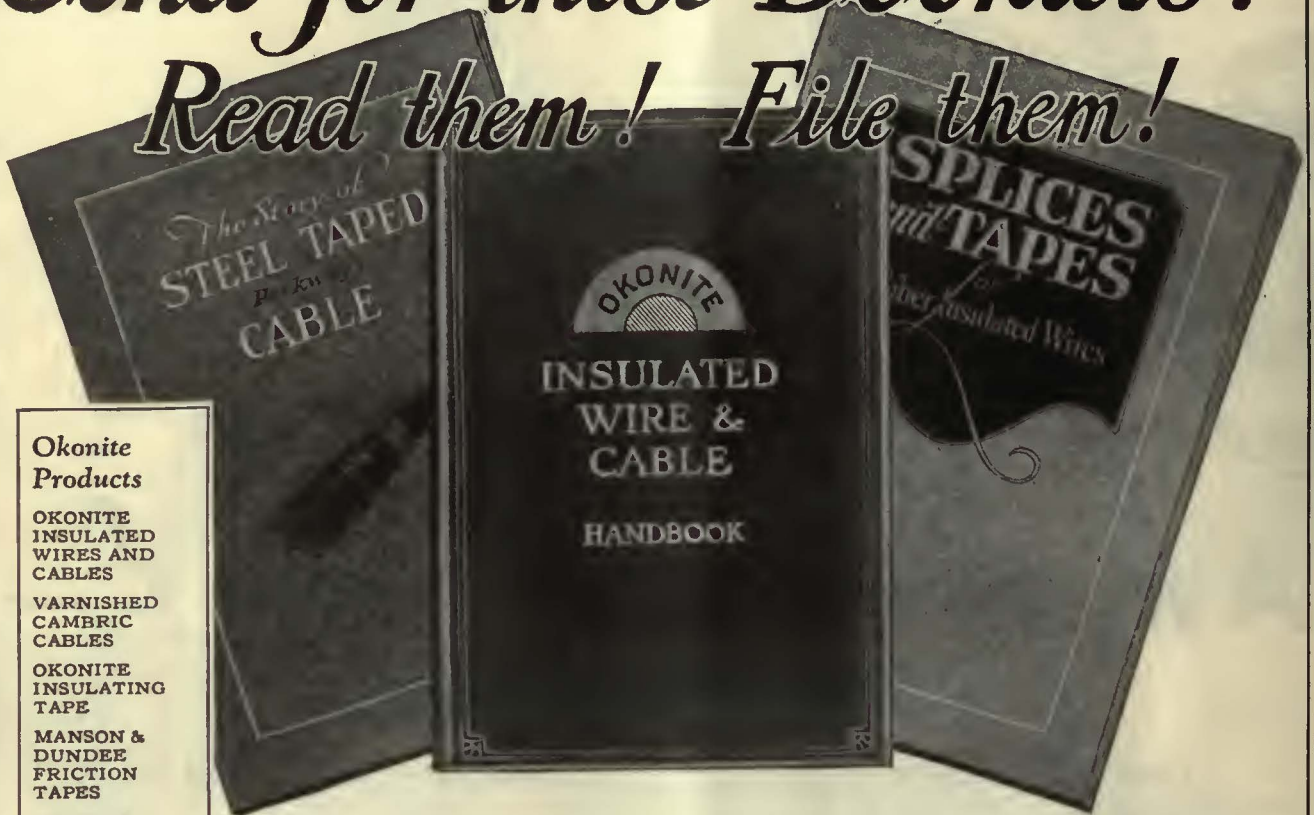
The  
**Mack**  
Bus





# Send for these Booklets!

## Read them! File them!



- Okonite Products**
- OKONITE INSULATED WIRES AND CABLES
  - VARNISHED CAMBRIC CABLES
  - OKONITE INSULATING TAPE
  - MANSON & DUNDEE FRICTION TAPES
  - OKONITE CEMENT
  - OKOCORD
  - OKOLOOM
- Okonite-Callender Products**
- IMPREGNATED PAPER CABLES
  - SUPER-TENSION CABLES
  - SPLICING MATERIALS

**HANDBOOK: OKONITE INSULATED WIRE AND CABLE**—This handy volume of 100 pages contains just that data one would expect to find in a real Handbook on the subject treated. In addition it tells how carefully Okonite Products are made, covers each principal kind of wire and cable, and explains each step in their manufacture. Profusely illustrated with views of our factory, processes, and "close-ups" of the finished products.

**THE STORY OF STEEL-TAPED CABLE**—You learn the "Why" of this popular type of cable, sometimes called "Parkway"; its development, purpose and advantages. Illustrations show actual construction in detail of Okonite Steel-Taped Cable and typical installations for Ornamental Street Lighting, Police and Fire Alarm Systems, Railroad Signals and Lighting Circuits. Complete "Specifications" and Tables for service up to 7,000 volts.

**SPLICES AND TAPES FOR RUBBER INSULATED WIRES**—Sixteen pages of worth-while information on The Importance of a Perfect Splice; The Important Properties of Tape; How to Recognize These Properties; and How to Make a Perfect Splice. Interesting description of "Okonite", "Manson", and "Dundee" "A" and "B" Tapes. Fully illustrated.

**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**  
 F. D. Lawrence Electric Co., Cincinnati, O.  
 Novelty Electric Co., Phila., Pa. Pettingell-Andrews Co., Boston, Mass.  
 Canadian Representatives: Engineering Materials Limited, Montreal  
 Cuban Representatives: Victor O. Mendoza Co., Havana



CHECK THE BOOKLETS YOU WANT AND MAIL COUPON TODAY.

THE OKONITE COMPANY, PASSAIC, N. J. Please send me booklets as marked below: E.R.J.

Name.....  
 Street Number..... City and State.....  
 Official Position..... with.....

- OKONITE HANDBOOK       SPLICES AND TAPES       "PARKWAY" CABLE



**An  
Outstanding  
Tribute  
to  
Yellow Coach**

**Public service corporations**



buy equipment on a record of performance.

After tests extending over the last twenty-four months with many makes of motor buses, the Public Service Railway Company of Newark, New Jersey, have



placed their order for three  
hundred and thirty-three (333)  
Yellow Gas-Electric Coaches.

This we consider an outstanding  
tribute to Yellow Coach quality  
and performance.

Public service corporations



everywhere will not fail to realize  
the significance of such action  
by the largest operators of motor  
coaches in America.

*John A. Ritchie*

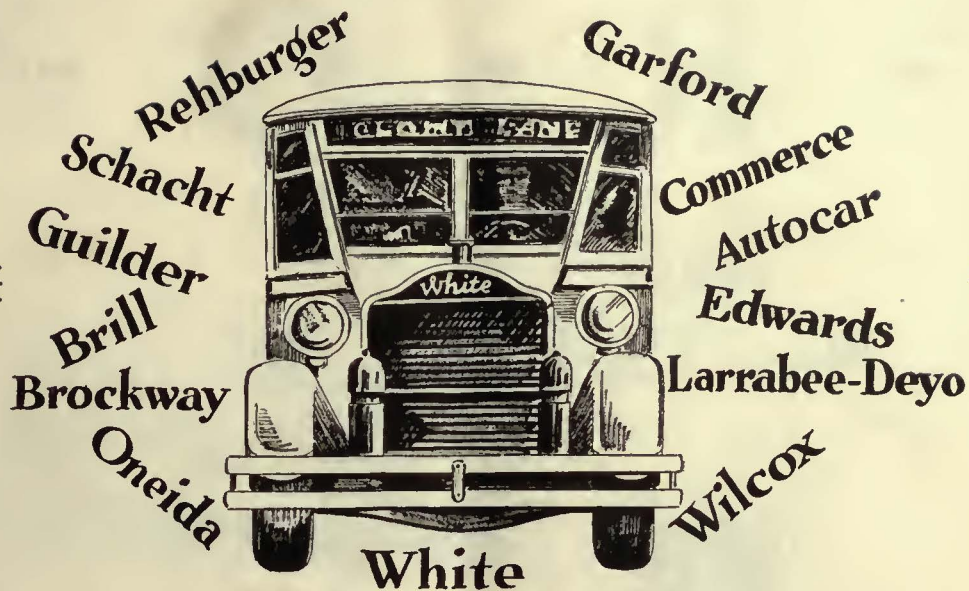
*President*

*Yellow Truck & Coach Manufacturing Company*

*5801 W. Dickens Avenue*

*Chicago, Ill.*





# “Standard Equipment”

Many of the largest and most successful bus chassis manufacturers have adopted Leece-Neville Voltage Regulation as standard equipment. The names above are familiar enough to railway bus operators.

But Voltage Regulation is standard equipment in another sense. It is easily applicable to every size and type of bus equipment in service today. It is a standard of electrical equipment efficiency that you can

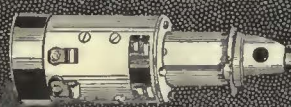
specify confidently, no matter what type of bus you contemplate purchasing. Continental, Waukesha, Buda, and Wisconsin bus motors have provision for Voltage Regulation without change. Any one of 300 authorized Leece-Neville Service Stations can deliver suitable equipment immediately. Other motors need little or no alteration.

Write us for an interesting booklet discussing this question in detail.

**THE LEECE-NEVILLE COMPANY**  
CLEVELAND, OHIO



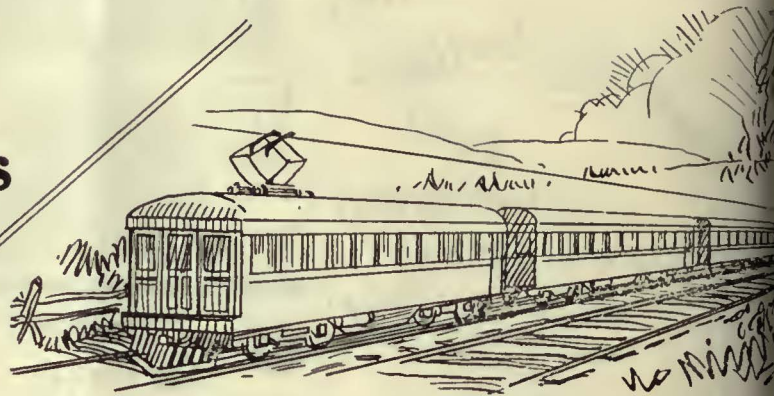
**VOLTAGE REGULATION**





# P - R - O - G

## Buy New Cars



**N**EW cars attract new riders while they speed up operation and reduce costs.

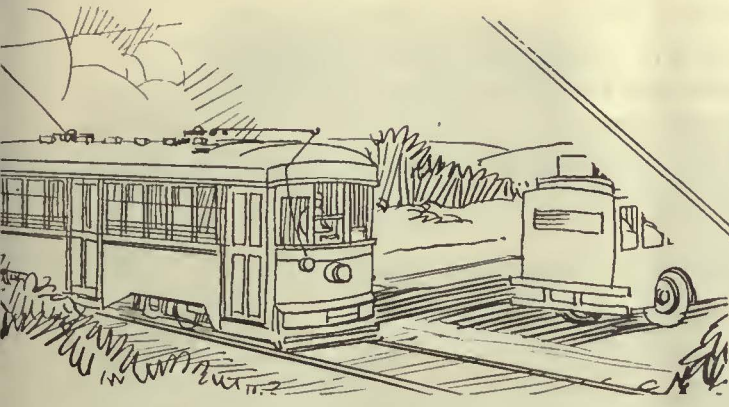
National Pneumatic Equipment should, of course, be used to operate the doors and steps in every modern type of car. When you plan new cars, call for a National Pneumatic Engineer to suggest the most practical and efficient method for controlling doors and steps.

Pneumatic Door Engines  
Door and Step Control  
Automatic Treadle Doors  
Motorman's Signal Lights

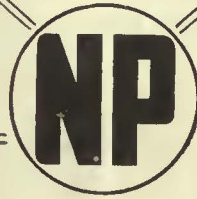
# NATIONAL



# R - E - S - S



Improve  
Old Cars



**T**HERE are many serviceable cars which can be brought up to date by the installation of modern equipment.

National Pneumatic Door and Step Equipment can be easily and quickly installed in your existing cars. The result is greater satisfaction on the part of the travelling public, a speeding up of service and a marked reduction in your platform costs. The installation of National Pneumatic Equipment is distinctly a progressive step.

**National Pneumatic Company**

*Executive Office,*  
50 Church St., N. Y.

General Works, Rahway, N. J.

Chicago:  
McCormick Bldg.  
Philadelphia:  
Colonial Trust Bldg.

Mfd. in Canada by  
The Railway & Power Engineering Corp., Ltd.

# PNEUMATIC

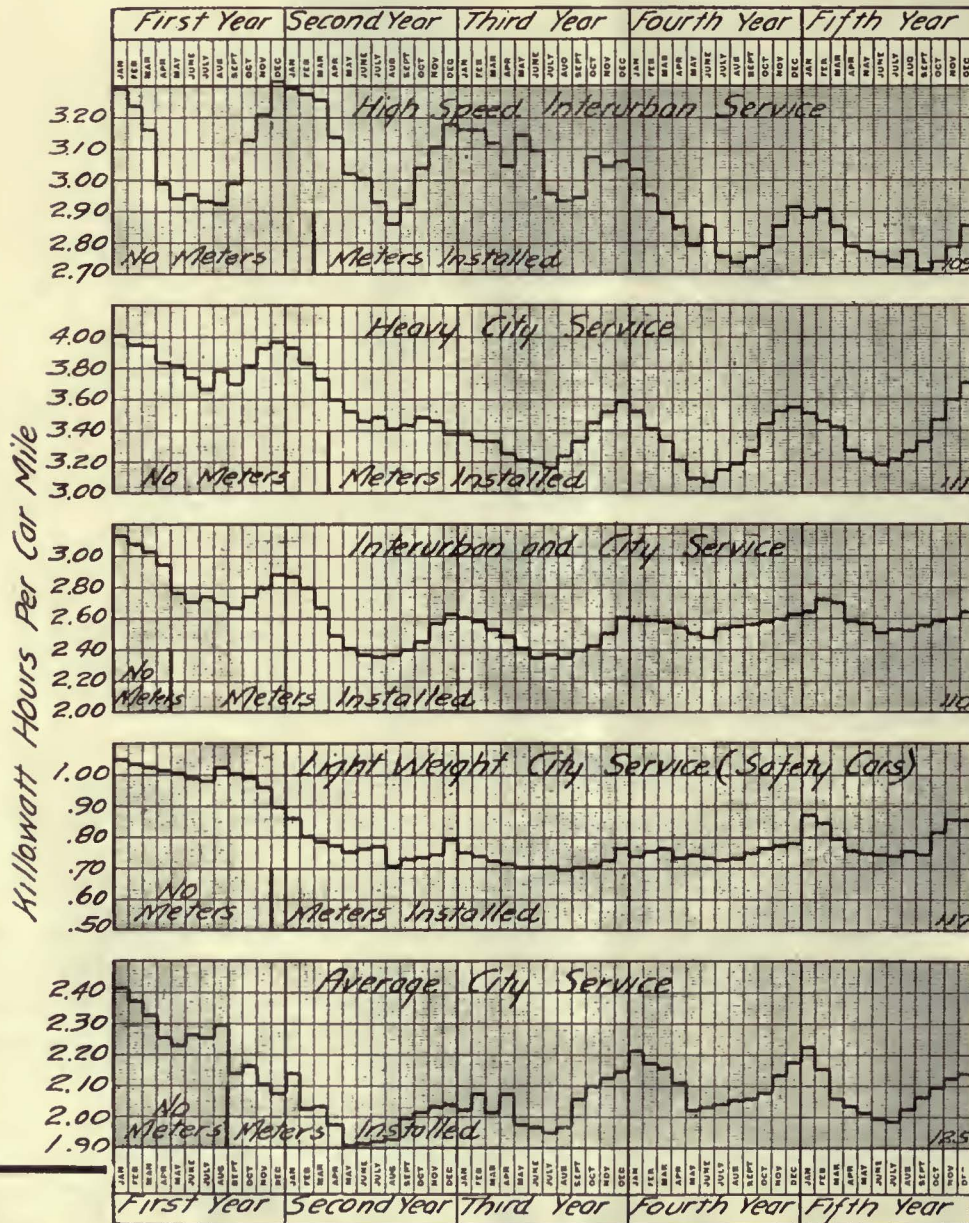


# Cumulative evidence of 25 years

## —5 Roads—5 Years—

Below are curves showing the average system energy consumption for five well-known electric railways. Note the downward slope in each case from the high year before to the lower years since the installation of "Economy Power-Saving Car Meters."

Names of roads and particulars of installations will be supplied on request.



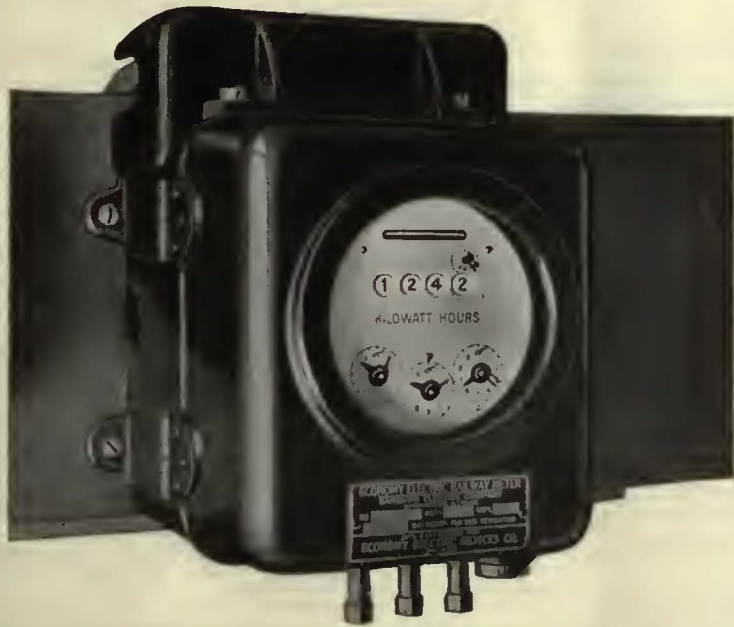
22,000

No. 341 Economy Electric Devices Co. Chicago

### Metering Energy Saves Energy and Equipment



# Ample proof that *Metering Energy Saves Energy*



## Some prominent users of Economy Meters

Buffalo & Lake Erie Traction Co.  
Chicago Surface Lines  
Chicago, North Shore & Milwaukee  
R. R. Co.  
Cincinnati, Newport & Covington R. R.  
Cincinnati Traction Co.  
Cleveland Railway Co.  
Denver Traction Co.  
Detroit Municipal Ry.  
Eastern Massachusetts Street Ry. Co.  
Georgia Power & Light Co.  
Grand Rapids Ry. Co.  
Key System Transit Co.  
Illinois Traction System  
Louisville Ry. Co.  
Michigan Electric Railways  
Milwaukee Electric Ry. & Light Co.  
Omaha & Council Bluffs Street Ry.  
Philadelphia Rapid Transit Co.  
Public Service Railway Co.  
Rockford & Interurban Ry. Co.  
San Antonio Public Service Co.  
San Diego Electric Ry. Co.  
Seattle Municipal Ry.  
Tri City Railway & Light Co.  
Union Street Railway Co.  
Union Traction Co. of Ind.  
United Railways of St. Louis  
United Traction Co. of Albany  
West Penn Rys. Co.  
Atlantic City & Shore R. R.  
Bloomington & Normal Ry. & Light Co.  
Cedar Rapids & Marion City Ry.

## ARS EQUIPPED IN THE U. S. A.

In the five cases cited more than 10 per cent saving has been made and maintained. This represents a saving, depending upon power costs, of \$75 to \$200 per car a year — more than enough to pay for the meters in less than the first year of operation.

All this is gained notwithstanding increases in speed and in traffic and street interference.

Dials on Economy Meters also provide for making mechanical and electrical car inspections on a basis of kilowatt hour readings rather than on time or mileage. This makes the inspection interval proportionate to work done — which is the safest and most efficient basis for equipment inspection.

Write for quotations and for full information about our deferred payment plan.

## Economy Electric Devices Company

L. E. Gould, *President*

1590-37 W. Van Buren St., Chicago

Sangamo Economy Meters (*General Sales Agents*) Aluminum Field Coils,  
Air Rectifier

*District Agents for*

Peter Smith Heaters Woods Fare Boxes Bemis Boyerized Truck Specialties  
Miller Trolley Shoes Chausse Kerosene Torch

Chicago & Joliet Electric Ry.  
Chicago & West Towne Ry.  
Citizens Traction Co.  
Clinton, Davenport & Muscatine Ry.  
Danville Street Ry. & Electric Co.  
Dubuque Electric Co.  
Dayton, Springfield & Xenia Ry.  
East Penn Electric Co.  
East St. Louis & Suburban Ry. Co.  
Eastern Texas Electric Co.  
El Paso Electric Ry. Co.  
Galveston Electric Co.  
Holyoke Street Railway Co.  
Houston Electric Co.  
Illinois Light & Power Co.  
Indiana Service Corp.  
Indianapolis & Cincinnati Traction Co.  
Interstate P. S. Co.  
Lincoln Traction Co.  
Monongahela, West Penn. Co.  
Morris County Traction Co.  
Nashville Ry. & Light Co.  
Ohio Valley Electric Ry. Co.  
Olean, Bradford & Salamanca Ry.  
Penn. Ohio, Electric Co.  
Poughkeepsie & Wappingers Falls Ry.  
Rochester & Syracuse Ry. Co.  
Scranton Ry. Co.  
Seattle & Renier Valley Ry.  
Southern Penn Traction Co.  
St. Louis Electric Terminal Co.  
Stark Electric Ry. Co.  
Texas Electric Co.  
Tulsa Street Ry. Co.  
Utah Light & Traction Co.  
Washington, Virginia Ry. Co.  
Wheeling Traction Co.  
Wichita Ry. & Light Co.

More than 100 others

# ECONOMY METERS



# Covering the country

## Pantasote for car seats and curtains

## Agasote for roofing, headlining, interior trim

**Albany**  
The Largest City in New York State  
Pantasote is a valuable feature in head  
lining, curtains and interior trim. It  
is a long-lasting material that does not  
wear out. It is a fire-resisting material  
and is a healthful material.

**Fort Wayne, Ind.**  
Fort Wayne is a big distributing center for the hauling business and also with a hundred additional interests.  
And Fort Wayne has the distinction of operating a car street car service using one man cars exclusively. Certainly it is the economy street car service in the world to conduct a nearly entire car street service without the attention to economy.  
And it is worth for this reason that the appearance of the car street car service of Fort Wayne has been the business service Corporation of Fort Wayne has been for 15 years and more made a standard operation of Pantasote for car seats and curtains, with Agasote for head lining, seats and upholstery.  
Experience in Fort Wayne and in the great majority of American cities have shown Pantasote Products. They are so superior and more than make up for their cost, even cost a little more in the first place, but their durability and resistance to wear and tear, and the savings effected through the reduced practice of changing for materials on a price basis.  
How much we will realize our agents in the Fort Wayne, Ind. street car service have been the most successful of electric railway systems for the past few years. Pantasote and Agasote have been the most successful of all the great business lines.

**Portland, Maine**  
Portland is the largest city in the New England States.  
Pantasote is a valuable feature in head lining, curtains and interior trim. It is a long-lasting material that does not wear out. It is a fire-resisting material and is a healthful material.

**Warning!**  
There is no substitute for Pantasote

**Pantasote Products would not be so universally used unless Economy prevailed after all!**  
Specify them for your buses also!

**PANTASOTE COMPANY**  
120 N. W. 21st St. NEW YORK, N. Y.

Pantasote Products would not be so universally used unless Economy prevailed after all!  
Specify them for your buses also!



# With Pantasote and Agasote

ELECTRIC RAILWAY JOURNAL October 31, 1925

Covering the country with Pantasote and Agasote

In the Far West

Fresno

The very spirit of the communities served by Far Western electric railways has practically compelled the adoption of progressive operating policies. Standards of service and car appearance have had to be kept high. Costs have had to be checked singly carefully to maintain an economic balance. That has meant careful buying of maintenance materials and well planned specifications on new jobs.

It is the reason why Fresno, the "Rain Town," together with Los Angeles, Fresno and practically every other Far Western city, has consistently and uniformly specified Pantasote and Agasote for use on its electric railway cars. The Fresno Traction Company has from its own experience proved the soundest cost economy of Pantasote Products. In doing this it has added to the accumulated proof of more than a quarter century's use of these products by steam and electric railroads throughout the country.

Remember that Pantasote seats and curtains never look shabby—never stretch, crack or blower under any conditions, that Agasote made, headlinings, and interior trim cannot possibly crack or warp and will not discolor under any conditions. Specify and insist upon genuine Pantasote Products—it pays well in the long run.

Don't wait until you have had one of the Eastern lines, where Pantasote and Agasote have been used almost a hundred years of service.

**PANTASOTE COMPANY, Inc.**  
NEW YORK

Pantasote Products for Both ELECTRIC RAILWAYS AND BUSES

*Pantasote Products would not be so universally used unless Economy prevailed after all!*

*Specify them for your lines also!*

**Warning!**  
There is no substitute for Pantasote

ELECTRIC RAILWAY JOURNAL November 14, 1925

Covering the country with Pantasote and Agasote

The Sunny South

New Orleans

New Orleans the "Crescent City," so called from its curious location as originally laid out along the banks of the Mississippi river has retained in great measure and tradition with the South the spirit of a busy busy port, and a flourishing center of business.

Its street cars in common operation by the New Orleans Public Service, Inc., some comprising more than 120 miles of track, are the first place to have specified Pantasote Products. In the first place they have had to face severe weather conditions for many years. Severe economy measures, with a growing demand for better looking cars, has made them a conspicuous operator of better looking material than will be found elsewhere.

That same test of the hardest service has demonstrated the practicality of Pantasote as a system and use in all its details—stretch, crack or warp, and of Agasote in its use in headlinings, upholstery, and interior trim. You can do no better than follow the procedure set by leading railroads throughout the country. Specify and insist upon getting only genuine Pantasote Products.

Don't wait until you have had one of the Eastern lines, where Pantasote and Agasote have been used almost a hundred years of service.

**PANTASOTE COMPANY, Inc.**  
NEW YORK

Pantasote Products for Both ELECTRIC RAILWAYS AND BUSES

*Pantasote Products would not be so universally used unless Economy prevailed after all!*

*Specify them for your lines also!*

**Warning!**  
There is no substitute for Pantasote

## South, East and West

### wherever electric cars are operated you'll find Pantasote and Agasote!

During the past ten months of advertising we have visited cities in nearly every state in the Union.

We have shown how Pantasote and Agasote have served the electric railways of these cities, in many cases for twenty-five years and more. Every phase of operation has been covered—street railway, interurban and electrified steam road. Every condition of traffic and climate has been represented.

North, South, East and West, the exceptional wearing qualities—the sound, last cost economy of Pantasote and Agasote have been, and are being amply demonstrated.

In the succeeding advertisements of this series we will give more complete listings of prominent cities where Pantasote and Agasote have been consistently specified by the electric railway operators. We invite you to make close investigation of our statements and claims.

And when you decide to place your order, either for installation on new cars or for rehabilitation, remember this—genuine Pantasote and Agasote, distinctive in fabrication and character, are the trade-marked products of this one company. It will pay you to be specific and to insist on getting just what you specify.

**The PANTASOTE COMPANY, Inc.**  
At 46th Street 250 Park Avenue Street  
NEW YORK

Pantasote Products for Both ELECTRIC RAILWAYS AND BUSES



TRADE

ROL-MAN

MARK



Chafing Plate



Chafing Plate

## Equipped with Rol-Man Parts

A well-known, heavy-traction railroad operating on an unusually rigid track construction with many short radius curves, found that hard wear resulted on all moving parts of the car trucks—and especially on the pedestal jaws.

To overcome this situation Rol-Man Manganese Steel Wear Plates were adopted about a year and a half ago. These plates have proved so satisfactory that all cars now coming in for general overhauling are being completely equipped with them—a result that speaks for itself.

But this is no exceptional case as Rol-Man Truck and Wearing Parts are proving equally satisfactory on other roads throughout the country.

*Further information on request.*



Pedestal Liner



Journal Box Liner

## Rol-Man Rolled or Forged Manganese Steel —Electric and Steam Railway Truck and Wearing Parts

Journal Box and Pedestal Jaw Gibs or Liners  
Bolster and Transom Chafing Plates  
Bolster Hanger Wear Plates  
Side Frame Wear Plates  
Bolster End Wear Plates  
Brake Rod Chafing Plates  
Truck and Body Bolster Center Plates

Brake Beam Wear Plates and End Supports  
Buffer Wearing Plates—Sector Bar Liners  
Draw Bar Parts for car bodies  
Forged Swing Hanger Axles and Supports  
Pins and Bushings for Brake equipment  
Automatic door equipment, Threaded Bolts, etc.


**“Reduce wear and save repairs”**

MANGANESE STEEL FORGE CO., Richmond St. and Erie Ave., Philadelphia, Pa., U. S. A.

Manufacturers of “ROL-MAN” ROLLED and FORGED MANGANESE STEEL PRODUCTS



# Looking ahead



**T**HROUGH the darkness that, in many minds, has enshrouded the future of the great electric railway industry, there comes a light. Old doubts are being dispelled, and new opportunities for service, with profit, stand out in bold relief. This light comes from the established success of *the modern car*.

With the advent of another New Year, it is an opportune time to consider the possibilities of modern cars on *every road*.

(Photograph taken by illumination from standard General Electric headlight)

11-76



# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES



# The future



*A good example of the popular one-man, two-man double-truck car. This is one of 175 light-weight cars in Providence, R. I., with four GE-265A, 35 h.p. Motors.*



*Rapid-transit car built for modern service from Miami to Coral Gables, Silver Bluff and Coconut Grove, Florida. Equipped by General Electric.*



Having equipped the rolling stock on many of the modernized roads, the General Electric organization has become a clearing house for ideas, information, and data on the subject. G-E engineers are prepared to render a special service to companies planning the replacement of out-of-date cars.



*Detroit's articulated unit is perhaps the most unique city car on wheels equipped with four GE-275 Motors, K-35 Control and CP-127 Compressors.*

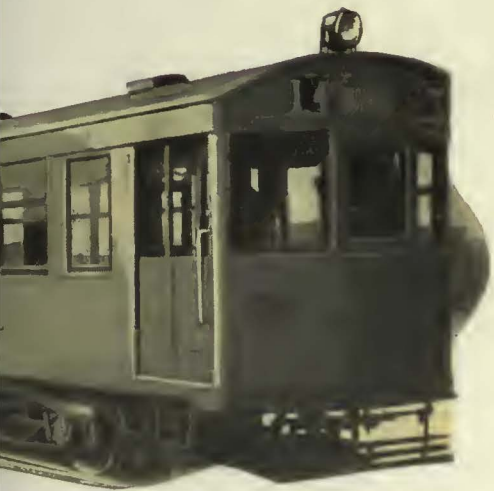
# GENERAL



# Offers attractive opportunities



cars, K-35 Controland CP-25 are on this noteworthy of the Grand Rapids Rail represents a 50 per cent weight as compared with the her equipment.



The past has pointed the way. "Modernization" has proved itself a worthy objective. The modern car is bringing prosperity to those electric railways which have adopted it. The industry is moving on to modernized methods and modernized equipment.

To scrap the obsolete cars still in service will require courage. To replace them with other cars better adapted to the transportation conditions of 1926 will demand the intelligent application of all that can be learned from the experience of others in modernization.

"Riding habit" has proved to be an elastic factor, with potentialities yet unknown. There are untold sources of revenue for the railway managements endowed with the vision and the ability to grasp opportunities.

The American riding public wants comfort. It wants goods put up in attractive packages—and pays well for catering to its tastes. But more than anything else, it wants *speed* in transportation and willingly pays the price to those who provide it.

In this phase of modernization, General Electric can render you a conspicuous service in furnishing light-weight motors, control and air brakes adapted to accelerate cars as fast as the other street traffic and to operate with lower current consumption.

Some notable examples of modern cars—G-E equipped—are shown here. Their success in attracting added passenger traffic, and in reducing expenses, points the way to increased earnings.

# ELECTRIC





## California Blue and Gold Car —a typical example of modernization



G-E car equipment has been chosen for many of the forward-looking car developments of the past year. It has been helping to establish better operating records since the beginning of the modernization movement. It is obtainable in any capacity to suit your requirements.

That the Market Street Railway, San Francisco, believes in modern rolling stock as a means of increasing patronage is indicated by the attractive color scheme used for its newest cars.

Nor has the importance of fast schedules been overlooked. On this road, steep grades are common, but these cars maintain high schedule speeds, using four sturdy and dependable GE-247 Motors.

In selecting the GE-247, the engineers of the Market Street Railway had in mind the successful operation of this motor in their service for the past five years.

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES



# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 67

New York, Saturday, January 2, 1926

Number 1

## *A Year of Steady Progress*

JUDGED in a material way, the electric railway industry has had a good year. Preliminary figures indicate that the reduction in riding during the early months was nearly if not quite made up in the summer and fall, so that the total passengers for the year will be little if any less than in 1924. With fares several points higher it is probable that the gross revenues will equal if not exceed those of the banner year of 1923. Operating expenses have changed relatively little, and with economies being practiced the net income for the industry should show a gain.

Faith in the industry is shown by the extensions of track, totaling 340 miles. This is greater than in any previous year since the war. New electrifications were 236 miles, also a record for post-war years. Track reconstruction lagged somewhat, but the total built and rebuilt and electrified was 1,156 miles, which is almost exactly the same as last year's record, which was the greatest since 1915.

SUFFICIENT attention was not paid to replacement of obsolete and worn-out rolling stock. Only 1,659 cars and locomotives were purchased or built during the year as against 4,092 the year before.

The financial situation has been very encouraging. Less difficulty was experienced in refinancing properties that could be regarded as sound investments. The lower requirements due to a smaller volume of maturities in 1926, will make financing materially easier this year. The receivership situation, which was at its worst immediately following the war, is rapidly clearing away. Although thirteen railways went into receivership last year, eighteen were returned to their owners. Two of the largest companies remaining in receivership are practically reorganized, so that

they can be expected to resume corporate management early this year.

Most encouraging is the attitude of the railway systems toward the bus. The place of the two modes of transportation is being defined more exactly. Better still, electric railway managements in large number are awake to the necessity of using the bus to round out their systems. New buses to the extent of 2,171 were bought last year by electric railways—well over twice as many as in any previous year, and the companies having bus operation increased 80 per cent. Altogether, 280 companies are now running 5,358 buses.

DURING the year just closed more constructive work has been done with a view to placing the electric railway industry on a sound footing than for many a day past. Leaders of the industry, realizing the need for forward-looking action, have been planning wisely to get a better viewpoint than has existed in the minds of the operators and the public.

Of great significance is the forward move made by the American Electric Railway Association in the formation of the Advisory Council and the appointment of Lucius S. Storrs as managing director. Much work is ahead of him. Alone he cannot accomplish a great deal. He deserves the co-operation and assistance of every electric railway owner, every operator, and every manufacturer serving the industry.

FOR the coming year there is a great deal to be done. Indications are that it will be a good year in regard to revenues and expenditures. This should make it possible to carry forward the plans that have been made for revitalizing the industry so that it may render the greatest of service to the public.



## Stabilized Conditions Should Make for Progress

**S**TABILITY of electric railway operating costs continued throughout last year. Even more than in 1924 the index figures for the industry remained fixed. This is brought out by Professor Richey's article in this week's issue, in which he reviews trends of costs and fares over the past thirteen years. The wholesale price index fluctuated between the limits of 161 and 155.2, or only 3.6 per cent, as compared with 7.9 per cent in 1924. Electric railway construction costs fluctuated still less, or between 205.3 and 200.0, or only 2.6 per cent. Electric railway operating materials costs varied between 150.3 and 158.4, or 5.4 per cent. Wages while high, showed almost no change during the year, going from 221 to 223, or only 0.9 per cent. On the revenue side of the ledger fares were likewise almost stationary, going from 149.6 in January to 151 in October, or 0.9 per cent. However, they receded a trifle to 150.7 in December.

Last year this paper commented on the remarkable stabilization in the index figures as compared with previous years. The fluctuations of 1924 now appear almost violent as compared with those of the year just closed. Last year it was predicted that stabilized conditions would be continued. It was pointed out that the constructive and conservative policy being pursued by the Coolidge administration would make for business stability and hence for similar conditions in the electric railway industry. That prophecy has been fulfilled. With the experience of the past two years there seems to be no reason why it should not be repeated—that present conditions will prevail throughout the present régime.

Conditions such as this should make for progress. Live managements have it in their power to plan with confidence. There is no reason to defer improvements for fear of losing by failure to wait for a more propitious time. What should be done is to adjust operations to the present-day status, and to go ahead without fear for the future.

## Record Breaking Bus Developments Mark Progress Toward Co-ordination

**E**XPANSION of bus service rendered by electric railways broke all records in 1925. While nearly everyone realizes from casual observation that this development has been fast and furious, its true significance is not so readily discernible. Figures show that between Jan. 1, 1924, and Jan. 1, 1925, the number of railway companies operating buses increased about 30 per cent and the number of vehicles slightly more than doubled. During the year just ended the number of railway companies operating buses increased approximately 80 per cent and the number of buses went up almost 120 per cent. New buses ordered in 1925 numbered more than 2,100 as compared with a total gain of some 2,800 in the number owned. Over 3,000 miles of new bus routes were established by the railways, while less than 300 miles of track was abandoned in favor of bus operation.

Careful consideration of the figures presented in the article on bus development published elsewhere in this issue leads to several important conclusions.

1. The increase in the number of vehicles being more rapid than the increase in the number of companies

indicates that the experience of the railways operating buses has been satisfactory and that they are extending this type of service.

2. The large number of buses ordered during the year by the railways shows that they are making an energetic effort to provide high class modern transportation facilities.

3. The difference of more than 700 between the net gain for the year in the number of buses owned by electric railways and the number bought from the manufacturers shows that the companies have bought out many competing independents with a view to co-ordinating rail and bus services. Just how many buses were bought in this way is difficult to determine, but the number is considerably more than 700 because the number of buses junked during the year must be added to the figure mentioned above.

4. The mileage of extensions to bus routes operated by electric railways being more than ten times as great as the railway mileage on which the bus has replaced the car indicates that the existing transportation systems are spreading out to provide service to additional territory.

Encouragement for both the bus and the electric railway is to be found in this situation. Not as competitors but as partners in a joint transportation enterprise they are forging ahead. Co-ordinated service, long believed to be the solution of the transportation problem, made real progress during the past year.

## The Public Judges a Railway by the Appearance of Its Cars

**C**ONDITIONS which demand the earnest attention of the entire industry are evident as the result of a survey of the age of electric railway passenger cars. This nation-wide survey, made by ELECTRIC RAILWAY JOURNAL as a feature of this issue, is published on another page. Although mere age alone is of little significance, when viewed in the light of progress that has been made in design and construction over a given period, it becomes a definite index to the condition of the physical equipment. The past fifteen years have brought many fundamental improvements in cars. Previous estimates indicating 25,000 obsolete cars that are in condition to demand rapid replacement are now shown to have been very conservative.

Of much greater importance than seems to be generally accepted are the factors arising from the condition of the cars on a given property. It has been demonstrated on many roads that modern, attractive equipment has a direct effect on the volume of riding. That it helps to maintain regular schedules and to reduce delays and pull-ins is obvious. But it is not so generally recognized that such cars have a direct effect not only on the public's opinion of the railway but also on the morale of platform employees and on their general attitude toward their work. There has also been too little attention given to the reduction in accident hazard made possible by modern cars.

Many examples indicate that the increased earnings and reduced expenses that result from the operation of modern cars of proper design provide an attractive investment basis for financing. Car builders are ready and willing to finance new cars on attractive terms that literally permit them to pay for themselves. One large



car builder considers equipment trust paper so attractive that he carries it himself as a desirable investment. According to this same builder, no electric railway has ever defaulted on an equipment trust.

In the light of these conditions it is apparent that the industry has been backward in modernizing its equipment. To be sure, it has passed through a most severe period of operating handicaps and restricted credit. But many properties have spent relatively large sums for rebuilding and rehabilitating old, awkward-looking and heavy cars. There has been a tendency to act on the basis that a street car should last forever. Too little attention has been given to the effect of obsolescence on the general standing of the railway in its community. The public has been educated to look for improved design and appearance in transportation vehicles, and in many cities the nondescript and venerable cars suffer by comparison with the modern automobiles. Their appearance has been taken as symbolic of the general condition of the industry.

Much of the popular apathy toward measures for the relief and improvement of electric railway transportation is attributable, in part at least, to the impression of general obsolescence made by the appearance of many cars. The sooner these are replaced and removed from service the quicker will the industry move forward toward that era of renewed prosperity and usefulness which most leaders of thought foresee for the immediate future.

#### Tendencies in Car Design as Reflected by Statistics

ONE-MAN, two-man cars were bought in greatest quantities during 1925. This evidence of the continued popularity of this type of car is an outstanding feature of the statistics of new rolling stock purchases for last year. For city service one-man, two-man cars constituted 45 per cent of the total of new cars bought, and 14.4 per cent of the interurban cars were of this type. Cars arranged solely for one-man operation amounted to but 11.6 per cent of the total number bought for city service. The number of two-man cars was nearly double that of the one-man type but less than half the one-man, two-man cars.

These figures summarize the relative buying during 1925 of the three types of passenger cars used in surface transportation. The flexibility of the one-man, two-man type which can be operated by one man during off-peak periods and by two men in most congested service meets a long-felt want.

In regard to the size of surface cars, most of the demand was for a car about 44 ft. long and seating 48 passengers. In collecting data for this issue no attempt was made to assemble information as to structural details, but from descriptions of cars published during the year it appears that end entrance and exit cars have been purchased almost entirely. Arch roofs and "T" posts are universally used. Platforms are level with the car floor or with slight ramps and a single step between the roadway and platforms is used. With this type of construction 26 in. diameter wheels became the universal favorite in order to keep step heights to about 16 in.

In general, there have been no radical departures in car design during the last year from that put forward in 1924. Much attention, however, has been given to increasing attractiveness and providing greater comfort.

#### Large Mileage of Track Extensions

##### Augurs Well for Future of Electric Railways

OPTIMISM for the future of the electric railways is the outstanding impression created by examination of the figures for track extensions made in 1925. New track built during the past year totals nearly 340 miles, more than in any other year since 1917. It would be difficult, indeed, to find more convincing evidence of the important place which the electric railway occupies in the general transportation scheme.

City track extensions were larger than for many years past, as were also the interurban track extensions. This was no sudden spurt to make up for delayed development, as each of the past four years has shown greater track extensions than the preceding twelve-month period. Expenditures for track construction in 1925, however, were not so large as they have been in some other years. This may be explained by the fact that many extensions have been in suburban territory, where the cost of construction is moderate, and also by the fact that part of the paving expense is now being borne by the municipalities.

That the figures for recent years are smaller than those of a decade ago should cause no uneasiness. In those earlier days the electric railway industry was still in a state of development. Today the need for rapid expansion is past, and a steady, healthy growth has taken its place. In fact, we now realize that not all of the expansion of earlier years was necessary or economically justifiable.

But that lesson has been learned. Extensions are not being made nowadays to compete with existing lines, nor to aid in the promotion of real estate ventures. They are made to fill real transportation needs, and only where the volume of traffic promises to justify the expense. Forced by the pressure of post-war high prices to scrutinize every expenditure with the greatest care, the electric railways have never cast off the habit. Yet they deem it worth while to continue building hundreds of miles of new track every year.

Let the pessimists weep at their own prophesies of impending doom for the electric railways. Unwavering confidence in the future on the part of the managements and investors is indicated by their readiness thus to increase the physical plant year after year.

#### Manufacturers Have Contributed Much to Progress of the Industry in 1925

WELL-GROUNDED satisfaction may be gained from the degree of stability which has marked electric railway equipment prices during the past year. While the general upward trend of economic prosperity has not affected this field directly, due perhaps to the policy of watchful waiting adopted by the operating companies in the matter of additions to equipment, nevertheless the industrial situation, viewed from the standpoint of the manufacturers, is not too somber in aspect.

Practically every business forecast assures a continuation of excellent industrial conditions in general for at least the first half of 1926. Prices are expected to remain fairly stable and there seems little reason to presume any variation from this rule on the part of railway supplies. In fact, it would seem, from the predictions for the current year made elsewhere in this issue by representative manufacturers, that a spirit of



confidence is shared generally in the ability of the industry to hold its own and slightly improve its purchases.

In the important matter of research and development work on new equipment the manufacturers have been far from idle during 1925. Regardless of the rather sluggish buying which characterized the past twelve months, the producers of railway supplies realized the necessity of further aiding the operating companies through improvements in rolling stock and equipment which would cut down operating costs and attract additional passengers. Hence the large sums annually expended in this direction suffered no material reductions.

It is interesting, in this connection, to note the particular forward strides which representative manufacturers themselves consider as having contributed most of value to the welfare of the industry. Among these were noteworthy reductions in the weights of city and suburban cars, the development of a practically noiseless street car and improvements in the efficiencies of gas-electric buses. Of more general application to transportation problems was the further perfection of oil-electric cars and locomotives.

#### Electric Railway Expenditures Again on an Even Keel This Year

CONSIDER the fact that the purchasing power of the electric railway industry in the last three years has had a high of \$282,000,000 and a low of \$262,700,000, a variation of less than 8 per cent. This indicates a most even trend of a business of truly large magnitude. The forecast this year is that \$296,150,000 will be spent on new plant and materials for maintenance of existing plant, exclusive of labor. This is nearly 10 per cent greater than the average of the last three years.

Essentially, half of the enormous total will be spent for new construction that will require some form of financing. In recent years this has been a matter of difficulty that has been overcome to some extent through the issue of customer and employee ownership securities or through the aid of car trusts or temporary loans.

The remainder of the budget is that portion of the operating moneys required for the purchase of materials, repair parts and supplies used in the regular maintenance of the cars, tracks, buildings and other structures of the operating companies.

The electric railway industry is indeed one of tremendous proportions. Besides the operating forces necessary to utilize the invested capital and put to work the new money planned for the new year, there is an entire army of men immediately behind the front line ranks in the form of the manufacturers. It is the duty of this group properly to design, manufacture and market the products necessary for operation.

Each phase of these operations is an important element in the successful operation of the railways, and the work of design, manufacture and marketing of the supplies and materials is of as much importance to the purchaser as the market itself is to the manufacturer. This relationship is often lost sight of and is one that calls for the closest co-operation.

Certainly the record of these years and the promise of the new year go a long way to offset the gloom that crops up from time to time, either occasioned by a local company in financial difficulties or perhaps from certain sections of the banking fraternity that have some railway issue thrust back on their shoulders through failure to pay a return on a swollen capitalization.

#### Proper Balance of Financial Structure Essential

SENTIMENT among bankers toward electric railway securities is distinctly more favorable than it was two years, or even a year, ago. This is reflected in the article elsewhere in this issue. The most glowing sentiments, however, are likely to run to cover under the test of performance. It is not intended by this remark to convey the idea that there is any lack of sincerity in the opinions expressed, but merely to indicate that less fear is felt both among the bankers and the investing public about the future outlook for the electric railways and for the securities based on these properties as a lien. That might at first appear like a Pyrrhic victory, but actually it reflects the sentiment fostered by the many examples of electric railways revitalized in the last few years.

Bankers recognize fully the adverse conditions under which many managements have labored and appreciate the accomplishments in the application of engineering and managerial skill, but they agree with the committee which reported at the Atlantic City convention that the only way out for many properties is by the reorganization of the capital structure. The presentation of this report was one of the most noteworthy events of the year. To many, no doubt, the recommendations contained in it, particularly the one urging voluntary readjustment of finances, came as a shock, but it was a shock that was very much needed. The committee certainly did a business-like job. There is no need to reiterate all the points that the bankers brought out. It does seem advisable, however, to point out again the value of the car trust certificate as a vehicle for the financing of purchases of new equipment. A review of the record of the past shows the high regard in which such securities are held among the bankers, the car builders and the investing public. A great help in this connection will be the successful working out of the plans for interchangeable freight equipment now under way among properties in the Central West.

The talent is available on the operating side to carry on progressively, but an improper, antiquated and rigid financial structure is recognized by the bankers as a greater hindrance than an antiquated engineering structure or plant. In either case the management does not have tools sufficiently flexible and convenient to permit satisfactory operation. To the end that the bankers may be more fully informed about the financial problems of the electric railways the plea is made for co-operation among the members of the American Electric Railway Association in presenting data which would include a balance sheet as of Dec. 31, 1925, with a record of earnings and interest charges for the last five years as an indication of each particular trend and also an estimate of earnings and interest charges for the next five years, and a statement of the probable new capital necessary and the debt maturing within five years.

The time for response to this appeal is at hand. Banker co-operation with the electric railway industry and the constructive work that the bankers may be able to do depend very largely on the extent to which the various companies respond. It is not always true, either financially or otherwise, that he travels farthest who travels alone. The industry is bent upon developing the science of transportation. There can be no adequate development of this kind that does not take fully into account the place that proper financial balance in corporate structure plays in modern business.



# Railways Plan to Spend \$296,000,000 for Plant and Material in 1926

**Purchasing Power of the Industry Shows Healthy Progress—An Increase of 11.66 per Cent Over Last Year's Figures Is Promised—Large Track Construction Program Is Included in Forecast Submitted by the 57 Operating Companies Furnishing Information**

**P**URCHASES by electric railways for the new year promise to exceed those in 1925 by 11.66 per cent. ELECTRIC RAILWAY JOURNAL'S forecast for 1926 is \$296,150,000. This is higher than the estimated actual expenditures for any of the preceding three years and is significant of the outstanding confidence in the permanence of the industry.

This is the fourth forecast of the purchasing power of the electric railway industry made by this paper. In December of each year it sends questionnaires to a number of large companies, in which they are requested to submit confidential figures showing the actual materials expenditures for way and structures, equipment, and power, divided between capital and maintenance accounts. Necessarily, the actual expenditures reported must be based on ten or eleven months of the current year, which, however, is generally quite accurate. The forecast for the coming year is based on the budget figures as actually prepared by those companies making replies to the questionnaire. There is a continual increase in the number of companies making returns. This year there was a total of 57 companies, represent-

ing most of the large companies and geographically well distributed over the United States.

An analysis of the accompanying table and charts based on the data contained in this table shows many interesting figures. Of importance is the trend of maintenance expenditures, which have steadily increased for three years and promise a further advance in 1926 equal to an increase over 1923 of nearly 50 per cent.

Expenditures for new plant and equipment in 1925 and the forecast for 1926 do not come up to 1923. The forecast for 1926, however, promises a substantial increase over 1924 and an even greater increase over 1925 of \$25,000,000. While the increased use of the bus is responsible for a large part of this promised advance, it is a significant fact that expenditures for way and structures, largely new track, promise a marked upward trend in 1926 of nearly \$20,000,000 over 1925.

Segregation of equipment expenditures into rail cars and buses is a new feature in this year's estimate. Expenditures for new buses and accessories by electric railway companies were more than \$15,000,000 in 1925, or 23.8 per cent of the total amount spent for equipment.

## "ELECTRIC RAILWAY JOURNAL'S" ESTIMATE OF EXPENDITURES OF THE INDUSTRY

### New Plant and Equipment

	1922	1923	1924	1925	Forecast 1926
Way and structures .....	\$85,000,000	\$74,000,000	\$56,000,000	\$52,400,000	\$72,000,000
Equipment .....	38,000,000	78,000,000	60,200,000	Rail..50,400,000	45,700,000
				Bus..15,680,000	22,750,000
Power .....	28,000,000	28,000,000	17,000,000	5,150,000	8,320,000
<b>Total .....</b>	<b>\$151,000,000</b>	<b>\$180,000,000</b>	<b>\$133,200,000</b>	<b>\$123,630,000</b>	<b>\$148,770,000</b>

### Maintenance Materials and Supplies

Way and structures .....	\$42,000,000	\$57,500,000	\$56,900,000	\$58,950,000
Equipment .....	44,000,000	54,000,000	Rail..54,700,000	54,000,000
			Bus...7,370,000	11,230,000
Power .....	16,000,000	18,000,000	22,650,000	23,200,000
<b>Total .....</b>	<b>\$102,000,000</b>	<b>\$129,500,000</b>	<b>\$141,620,000</b>	<b>\$147,380,000</b>

### Total of New Plant and Maintenance Materials

Way and structures .....	\$116,000,000	\$113,500,000	\$109,300,000	\$130,950,000
Equipment .....	122,000,000	114,200,000	Rail.105,100,000	99,700,000
			Bus...23,050,000	33,980,000
Power .....	44,000,000	35,000,000	27,800,000	31,520,000
<b>Grand total .....</b>	<b>\$282,000,000</b>	<b>\$262,700,000</b>	<b>\$265,250,000</b>	<b>\$296,150,000</b>



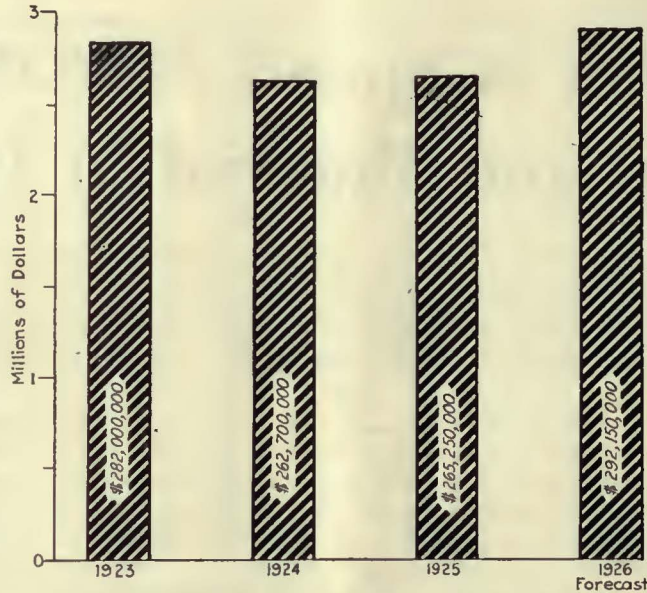
In 1926 the expenditure for buses is estimated at nearly \$23,000,000, or 33.2 per cent of the total estimated new equipment purchases in 1926. The combined expenditures for rail cars and buses have thus remained fairly constant for a period of four years, including the 1926 forecast.

Of peculiar interest is the marked upward trend of the estimate for new track expenditures in the 1926 forecast. For the first time in four years the track expenditures have forged ahead of those for equipment. One incentive for increasing line extensions, double-tracking, etc., is undoubtedly the relief of paving charges that many companies have succeeded

in obtaining. With the coming of the new year further relief is expected from this antiquated form of taxation.

New plant expenditures in the power group show a marked falling off for 1925 and in the forecast for 1926. This is undoubtedly due to the increased use of purchased power as against power generation and denotes generally an economy in operation, although it detracts from this one angle of the purchasing power of the industry.

Without doubt there was an excess of optimism a year ago on the part of the railway companies reporting expenditures and budgets, which were used in making this annual estimate of the purchasing power of the industry. The excessive estimate for new plant and equipment was more than could be expected of a conservative growth. Early in 1925 there was a general recession in business all over the country. This naturally had its effect on the electric railway industry. In the early months of the year passenger traffic was off considerably. While improved business conditions in the summer and fall increased the riding, so



The purchasing power of the electric railway industry for materials and supplies, and new plant and equipment, equals nearly 30 per cent of its billion dollar annual income.

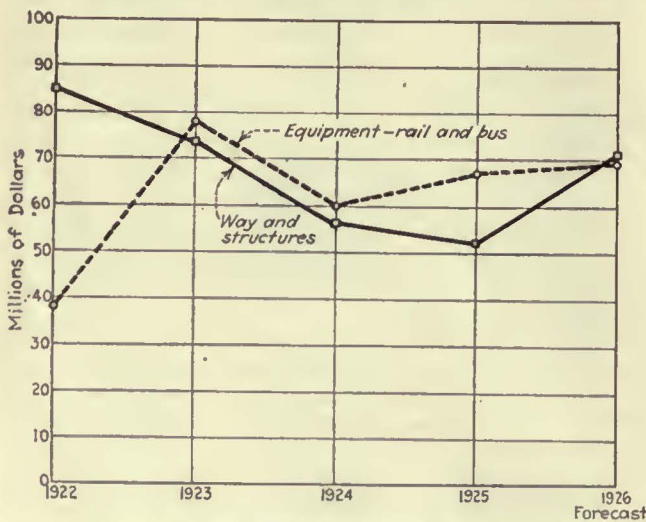
that the total revenues for the year will equal those for 1924, the period for starting major improvements had passed. Consequently many companies showed a materially reduced program for extensions and capital expenditures from that they anticipated a year ago.

The estimated purchases of maintenance materials and supplies, however, were exceeded and indicate a tendency to put the house in order and to progress with new projects in an orderly manner.

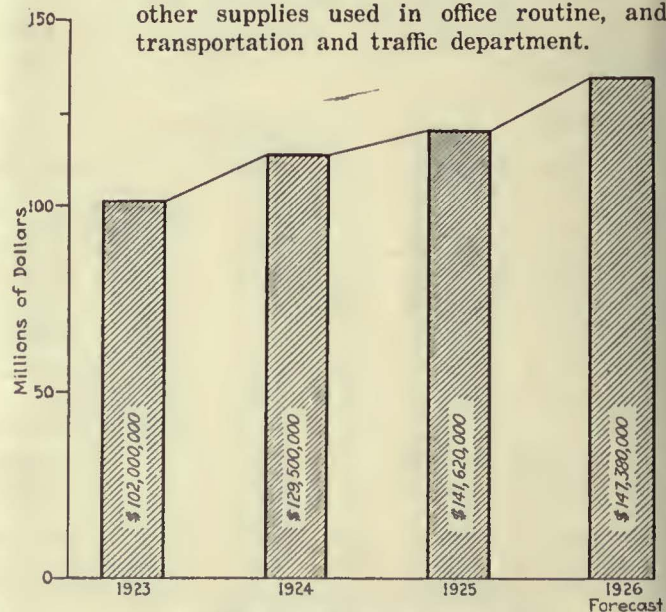
The method of making this forecast by ELECTRIC RAILWAY JOURNAL is similar to that employed in years previous. Essentially the same list of companies was requested to report

expenditures for the year 1925 and the budget for the coming year. Some companies replied that they made no budgets, others replied that they weren't ready, and others just didn't reply. A great many of the companies, however, appreciated the importance of the estimate and made careful and prompt returns. Included among these are most of the large companies in all parts of the United States. The totals for the industry are interpolated from the ratio that the track mileage and operating cars of the reporting companies bear to the total of the industry.

These estimates do not include expenditures for new subways and elevated railways that are financed by the cities in which they operate. Likewise this estimate is far less than the actual expenditures for operating the properties as the estimate of maintenance materials and supplies is only for purchases of such materials, and does not include labor or the purchases of other supplies used in office routine, and transportation and traffic department.

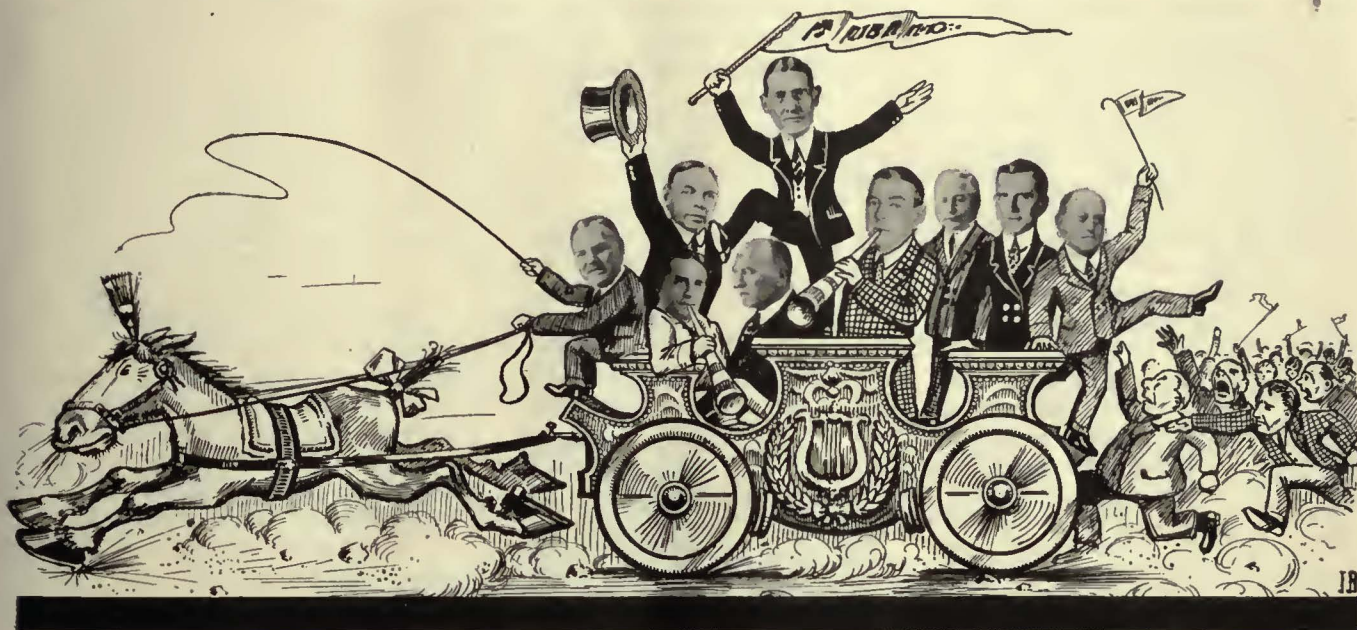


Analysis of purchases for new plant and equipment indicate that expenditures for way and structures will forge ahead of increased rolling stock purchases in 1926.



The steady increase in maintenance and rehabilitation expenditures is the greatest indication of the operators' faith in the industry.





Your Place Is on the Band Wngon Along with the Leaders

## Fiction Has Nothing on These Facts!

Suppose You Went to the Door to Answer the Bell and Found a Conductor Instead of a Cop, What Would You Say?—A Science of Transportation Is Being Developed—If You Don't Believe It You Are Out of Touch with the Events of the Industry During 1925

By G. J. MacMurray

News Editor ELECTRIC RAILWAY JOURNAL

SIMEON FORD, the famous wit, said of one of his articles: "If this article, which is meant to be deliciously light and playful, appears to you to be fraught with an underlying varicose vein of gloom, do not hastily pass it by, but remember that it's in the interest of science." That sentence helps a lot. It certainly is a light and playful task to take all the outstanding events of the year in this industry and weave them together into a whole that will be as stimulating as is H. G. Wells' history of the world. But the vicissitudes of journalism are beyond divination. Science must be served. Mr. Wells can, perhaps, afford to be romantic rather than realistic, but I must be realistic in much that I write. All Secretary Welsh's men would call me to account if I treated playfully the statistics of the industry compiled by my good friend Edmund J. Murphy, who registered his *magnum opus* as an orator at the recent convention at Atlantic City.

All the adverse factors considered, there is cheer for nearly every-

body in statistics published by the American Electric Railway Association in May which gave operating results on 370 companies, mostly the larger ones. Altogether their operating revenues in 1924 were \$786,530,422, or approximately 1 per cent less than in 1923; the operating expenses in 1924 were \$581,288,567, or approximately 0.6 per cent less than in 1923, making the 1924 net operating revenue \$205,241,855, or approximately 2 per cent less than in 1923. The revenue passengers decreased 1.18 per cent. These figures are neither strident nor cacophonous. They are merely a delicate adumbration of sacred truth achieved by the association's cicerone of statistics. I have no desire to paint the lily or to gild gold. Let us pass on.

### FACE TO FACE WITH THE PETRIFIED PAST

Far too often we find ourselves face to face with the petrified traditions of past periods. This is not a new situation in the electric railway industry. Heretofore this matter

has been met by doing something drastic, very drastic—like passing a resolution. This year, however, the new Advisory Council, headed by B. C. Cobb, selected Lucius S. Storrs to develop a science of transportation which would result in bringing the members of the family into what Samuel Johnson might have called a consanguine conglobulation. The industry's birthstone might be the grindstone, but it at last came to the same conclusion as the vacuum cleaner, which exclaimed one day as it was pushed over the carpet: "I'm being played for a sucker." In other words the industry was like the man who slipped on a banana peel and executed a funny face, not being hurt, as it turned out, but having his dignity somewhat ruffled. When he recovered a moment later a friend was holding his hat and a number of people had formed a circle.

"What do these idlers want?" he snarled.

"They are not idlers," explained his friend soothingly. "Here's a doctor who wants to look you over,



a lawyer ready to bring suit for you and a producer of comic films who would like to write you up."

It was something like that with the railways. There they were, all the experts—one saying his traffic arteries were congested, another that his co-ordination was bad.

What the industry needed was not more doctors, but fewer of them. If expert advice were wanted, why not get a man who was an expert? And so it turned to Mr. Storrs. Not until Mr. Storrs had been in office several months did he attempt to prescribe. Then at the meeting of the New York Association he said that the electric railway industry needed to do four things: (1) Modernize equipment, including co-ordination of electric car and bus service; (2) inform the public regarding local transportation facts; (3) obtain greater co-operation among individual utility men for the general good of public service; (4) secure remedial legislation necessary to better service by open and above-board methods.

THE POWER BEHIND THE DRONE

This diagnosis provoked a lot of comment. But the comment of our contemporaries is not always constructive. It often is merely conversation. That's what much of the comment on the Storrs speech was—just conversation. It was like the remark emitted by Pat, in the hospital for observation after an accident. The house surgeon carefully examined the patient, after which he thus stated the case to the nurse:

"As subcutaneous abrasion is not observable, I think there is little reason to apprehend tegumental cicatrization of the wound. What do you think yourself?" he asked Pat. "Sure, doctor," replied Pat, "you're a wonderful thought reader. You took the words out of my mouth."

All of which may make Mr. Storrs the power behind the drone.

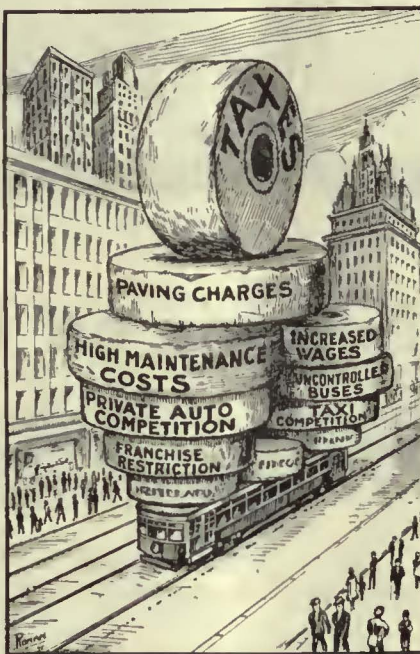
And so we enter upon the period of the renaissance of the industry. It is always difficult to fix the limits of any such period. For many companies it began years back, for others it has only lately begun, for still others it remains to begin and for the few it never will begin. These last will become the men of forgotten streets. The direction in which this industry is headed is shown by the material contained in briefs submitted in the contest for the Coffin award, won this year by

the Pittsburgh Railways, and by the events of the October convention. A. W. Thompson, president of the Pittsburgh company, said that while many things have made it possible for the company to come within the requirements laid down for the contest, he believed its chief asset has been the successful partnership arrangement with the city for the operation of the trolley service.

Incidentally there never was a convention of the association that reflected so well the general progressive spirit of the industry as did the

mediate predecessor, made a particularly enviable record. This is all the more to his credit as he succeeded in office a man of very great talent, a prodigious worker and a rescuer of properties for which before his advent there appeared to be little or no hope. Mr. Shannahan, unassuming, unpretentious, took up the work where Mr. Budd left off. The torch was his to hold high. And he did. Largely to him is due the credit both for the formation of the advisory council and the appointment of Mr. Storrs. As for the general work of the association, that story was told at length by John A. Dewhurst in the issue for Dec. 12, page 1029.

In speaking of the convention there is no reason why the lighter side of it should be left out of consideration, just because it was discovered too late to do anything about it that one of the speakers had been vaccinated with a phonograph needle. The girls over at the association office, the Misses Sheridan and Kelly and the sprightly Mrs. Siebrecht, are wearing at work the smocks that were distributed on Carnival Night. In doing this they have set a fashion—created a style. But we are getting away from the point, as the shavings remarked to the pencil sharpener.



The Industry's Birthstone Ought Not to Be the Grindstone

one last October. That isn't apple sauce, either. It led all others in accomplishments, in attendance, in exhibits and in the quality of the presentations by the committees and the various speakers. Freddie Dell, who always insists that things shall be just so, supplied the following final figures.

Year	Convention City	Total Registration at Conventions	Square Feet of Exhibit Space Sold	Number of Manufacturers' Company Members
1921	Atlantic City	1,189	No Exhibit	225
1922	Chicago	4,200	61,895	244
1923	Atlantic City	4,404	75,681	274
1924	Atlantic City	5,804	86,349	330
1925	Atlantic City	7,147	100,030	371

The new president, Frank R. Coates, has a most likable personality and is a capable and progressive operator. Jack Shannahan, his im-

DEVELOP THE SCIENCE OF TRANSPORTATION

Don't think that all the good papers and all the good things were said at Atlantic City. It was at the midyear meeting that announcement was made of the real program of the association for the year and that Mr. Storrs had been chosen managing director. You will recall that Owen D. Young said at this meeting that "you have an industry, but perhaps you haven't an art; you have a trade, but perhaps you haven't a science, and I take it, it will be the business of your managing director to develop the science of transportation in your field." There were many notable sectional meetings. At the New York gathering Mr. Storrs laid down his program for the industry. Mr. Shannahan in New England spoke on broadening the work of the association. It was only one of a number of important addresses made by him. D. W. Snyder of the Illinois Traction made a notable address on merchandising transportation last April before the Illinois Association. In June interurban consolidation and



car design were the topics of the C.E.R.A. summer meeting—always a great event.

Again Mr. Storrs made a cheerful and constructive address. At this meeting of the C.E.R.A. John A. Beeler advanced his suggestion for the consolidation of the interurbans in the Middle West, with the construction of connecting links. Like all of Mr. Beeler's work he made it specific and the presentation entertaining. It was a big idea, this. To a limited extent the suggestion is being achieved by the Insull interests, who have the North Shore, the South Shore and other interurban properties extending as far south as Louisville. Meanwhile don't forget the good work done in rehabilitating the Buffalo & Erie Railway and the very excellent work on the Detroit United!

#### IT'S A PRIVILEGE TO DEMAND GOOD TRANSPORTATION

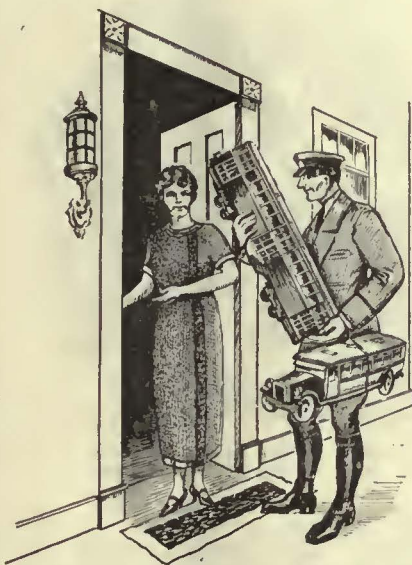
At the C.E.R.A. meeting, too, was the suggestion made by Charlie Gordon about the need for style in car design and the first intimation conveyed to the industry of the extent of the obsolete equipment which is now in service. This need for the installation of new equipment was driven home at Atlantic City and later by Mr. Shannahan in his West Virginia address. Many managers, far too many managers, are endeavoring to merchandise a product of the kind produced in 1900 or earlier. Is it any wonder that the public is reluctant to respond? And you will recall that George Kippenberger, now vice-president of the St. Louis Car Company, said that the car builder had very little choice in the matter. The manufacturer built to specifications. He sensed that in this day and age the passengers wanted something more than just to be handled safely. This is a reflection of the same sentiment to which Pete Witt gave expression at the midyear meeting to the effect that Pullman was the first man to sense the fact that the public wanted better transportation. As James H. McGraw said in "Charting a New Course" in the issue for Sept. 26, "It is a privilege of the people to demand better and better transportation, and for it theirs is the obligation to pay. Our duty is to serve in a manner worthy of our trust."

The extent to which the JOURNAL prints the proceedings shows the regard in which it holds all these

efforts to bring out significant facts presented in the papers and in the discussions before national and sectional bodies.

#### SIR GALAHAD OF PUBLIC SERVICE

To borrow a phrase, the electric railway man should be Sir Galahad with public service as his Holy Grail. The equipment means little if its use is not sold intensively. That is just what is being done. Not only is service being advertised, but the street car and the bus are, metaphorically speaking, being taken



Selling the Car and the Bus Just as Other Commodities Are Sold

right into the home. The Toronto Transportation Commission asked its patrons by mail for service suggestions. So did the Key System Transit in Oakland and the Springfield Street Railway, Springfield, Mass. The Pittsburgh Railways sent a Christmas card to a selected list of its customers. In Grand Rapids, where so many progressive things have been done, L. J. DeLamarter organized a campaign in which his trainmen called personally on the ladies of the city with a message from the street car company. Imagine answering the front doorbell and finding a conductor there instead of a cop. Mr. DeLamarter wasn't content with this. He also staged his famous "Don't Worry" campaign. In an editorial early in the year the Philadelphia *Ledger* actually paraded the virtues of Mr. Mitten's motormen and conductors before the public of the City of Brotherly Love. Instance upon instance might be cited of this growing appreciation of the place of the railway in the community.

At the midyear meeting Pete Witt said he had ridden street cars in nineteen cities until he was sore but satisfied. In one of these cities Pete mistook the conductor for the fellow who greases the track. Pete's talk registered, all right, but what of the general transformation now going on? Think of the natty conductors of the Grand Rapids Railway, the Lord Chesterfields on the cars in Denver, the Beau Brummels who work for Bill Sawyer on the lines of the East St. Louis & Suburban Railway, which recently had its third annual clean-up of cars and crews! Forty-six men at East St. Louis received the maximum reward for their spic-and-span appearance; more than 100 others received a \$5 bonus.

In Oil City, Pa., cars are being named for local pioneers. The Oklahoma Railway has purchased and fully equipped a model farm near Guthrie. Francis Wilson, one of the receivers of the Kansas City Railways, has been riding on his own cars for five years to learn what the public wants. All of which helps to get the community with you, as Tom Fitzgerald of Pittsburgh said. There the management recognized the truth of Lincoln's words "With public sentiment nothing can fail, and against public sentiment nothing can succeed." Last summer both the Brooklyn City Railroad and the Des Moines City Railway permitted women to smoke on cars. Instance upon instance, each notable in itself, could be piled up here as a record.

#### THEY JUST WOULDN'T BE LICKED

Not only in what they are actually doing for the public are many companies setting a dazzling pace, but they are telling the world about it—they are emphasizing their own good points and bringing the good points of their city and their community to the attention of the public. Consider for a moment the little booklet, "A Texas Idea!" Five little utilities down in Texas, the kind that were hardest hit, just refused to be licked. One of them won the Coffin award a year ago, but the work of the others was equally notable. "A Texas Idea" was a classic.

It would of course be impossible to cite all the good advertising that has been done during the year. There is the noteworthy work of Labert St. Clair, effective and available to the entire industry. Guy C. Hecker made the editorial page of the New York *Evening Post* with "Now,



My Idea Is This." In addition to this there is a vast effort on the part of individual companies. An outstanding instance of this is the work of the Atlanta company. It made a great deal out of the fact that it permitted its patrons to have a voice in choosing the colors of the company's cars. It also did a whale of a job in advertising the new bus service. It just made the people of Atlanta want to ride.

#### SERVICE MEANS SELLING FREIGHT ON THE INTERURBANS

The most important development in the interurban freight business in the recent past has been the establishment of through rates and joint transportation arrangements, not only between connecting electric lines but also with steam railroads and boat lines. Freight service offered by the average interurban line at the present time is largely confined to the handling of merchandise or package compartments. Little has been done toward the development of straight carload business. A few companies have established a pick-up and delivery business. During 1925 the freight business will return a revenue of about \$65,000,000 to the electric railways.

The roads in the small cities are still having a great deal of trouble, but recognition seems to be growing of their essentiality. Witness the recent votes in favor of continuing the railways in Oskaloosa, Lorain, Port Arthur and Whitefish Bay as opposed to the substitution of the bus. The Gary Railway, under Insull management, has made a notable record, as has also the Atleboro Street Railway system, modernized and brought up to date as described by John A. Miller, Jr., in the issue of Aug. 29. Here, too, is the bus being co-ordinated with the railway.

Not all the riding is being done that should be done—or, perhaps, better could be induced, but the record, except in certain individual cases, is a progressive one. The latest United States census shows that in 1922 each inhabitant rode 116 times as the average. In 1890 there were only 32 revenue rides per inhabitant. The number of revenue rides is much greater in the cities. In 1922 they were 257 per capita, an increase from 109 in 1890. The per capita rides in the city of New York have increased from 218 in 1890 to 448 in 1924.

Right here don't forget the good work of the various public relations men and the heads of the State Public Utility Information Bureaus! These fellows, by and large, are doing a whale of a job. Nothing is more important than a public relations policy of the right kind. Public relations work must be done well or it had better be left alone. Altogether too many of these men oc-

fare rush-hour universal transfer service. The bus is a different vehicle. It offers a different service, and the price should be in accordance. No paper presented during the year aroused more comment than did that by Fred Buffe, general manager for the receivers of the Kansas City Railways. Reference to his remarks brings up the question of the use of the bus by the railways. JOURNAL figures elsewhere in this issue show that 280 electric railways are using 5,300 buses. In 1921, the records indicate that there were only 16 electric railways operating buses. In too many instances of the union of the railway and the bus it has been a case of miscegenation. The bride married with condescension, hoping that the bridegroom might rise to her level and never for a moment suspecting that hubby was already at her level if not above it.

In 1924 the largest single increase in the number of buses was made by the Public Service Railway, which added more than 500 to its equipment. Second in number of buses acquired during that year was the Northern Ohio Traction & Light Company, and third, the Pacific Electric Railway. Notable additions were made by all of these companies in 1925 and by the Cleveland Railway, the Kansas City Railways, the D. U. R. and at Atlanta. In Philadelphia alone 200 buses operating over seven routes have been put in service by the Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company. There is little need to do more than mention Mr. Mitten's purchase of the Philadelphia taxis.

Early in the year the Supreme Court held that the regulations which state commissions could exercise over interstate buses was very limited. Previously the Interstate Commerce Commission had declined to exercise control on the ground that it was without authority. As a result, unregulated interstate buses are competing with common carriers, long under governmental control. Action to regulate these buses impends in the bill now before Congress.

The bus as a topic should not be dismissed without mention being made of the notable eleven-page article by Morris Buck and Carl W. Stocks on transit conditions in St. Louis. The authors went over the entire ground, covering competitive opera-



Too Frequently the Public Relations Policy Is Wrapped Up Ready for Delivery

copy the rôle of attorney for the defense. Mr. Storrs says that too frequently is it the case that when the company's public relations policy is wrapped up and ready for delivery the public relations men are expected by hocus-pocus methods to have it received with enthusiasm and even with public applause.

#### GIVE THE STREET CAR A CHANCE

After all, the street car utilizes the surface street area more effectively for passengers carried than any other vehicle. Suggestions made by the committee on traffic congestion of the American Electric Railway Transportation & Traffic Association include abolition of automobile parking at all or specified hours at all points where it seriously interferes with the free movement of car traffic; establishment of one-way streets; establishment of boulevard stops at thoroughfares having car lines; some segregation of traffic; some regulation of pedestrian traffic; abolition of parades along or crossing streets required for heavy essential traffic; some abolition of left turns; establishment of safety zones, where electric cars stop to receive or discharge passengers.

The street cars furnish the low-



tions in that city. This was the first time that the full story had been told. It was an unbiased analysis of the present situation in St. Louis and the events that led up to it. Adoption of a standard classification of accounts for bus companies also is of interest.

**LOW FARES FOR SHORT DISTANCES**

While the uniform fare with free transfer remains that most generally employed in urban service, there has been a tendency on some lines toward lower fares for the very short distance rider and the very frequent rider. Conspicuous examples of the former practice are in Boston, where the local rider in the suburb pays 6 cents instead of 10 cents, the fare if he uses the rapid transit system; the Public Service Railway of New Jersey, which has 5-cent zones, generally coincident with city boundaries, and San Diego, which has an inner 5-cent zone and an outer 5-cent zone. In general, transfers are not given when only 5 cents is charged. The most conspicuous effort to give fare concessions to the frequent rider is through the unlimited ride weekly or Sunday pass.

**NOTABLE FRANCHISE NEGOTIATIONS**

On April 7, by popular vote, Chicago turned down the plan for a unified transportation system. The approximate cost of the entire system was to be \$720,902,000. By vote on April 7, Milwaukee rejected a proposed service-at-cost contract between the city and the Milwaukee Electric Railway & Light Company. The most important new franchise adopted during the year was that by the Cincinnati City Council, which was passed and accepted by the Cincinnati Street Railway. It went into effect Nov. 1, 1925. It is of the service-at-cost type, with a fare control fund having a low limit of \$200,000 and upper limit of \$600,000. As part of this plan the Cincinnati Traction Company passed out of existence and Mr. Schoepf, its head for 25 years, withdrew from his local activities. More than 300 employees who served under Mr Schoepf are carrying watches as a reminder of his largess. The committee of the Massachusetts Legislature on Dec. 15 recommended an extension of the public control act of the Boston Elevated Railway for a period of 30 years. Last May the JOURNAL said: "Mr. Doherty Puts It Up to To-

ledo." In November Toledo appears to have reversed the process in the Riggs report, although it is not yet clear whose problem it is. Anyway Professor Riggs suggests a new deal there. This report was immediately passed over by the Council without comment to its committee on railroads and telegraphs, with which body it now reposes.

The large number of automobiles on the street has greatly increased the problem of accident prevention.

ization of local safety councils and safety campaigns.

As a further inducement to employees to make good safety records 31 electric railways in the United States now use bonus plans of one kind or another. Railways have much to gain from the results of the conference on street and highway safety, initiated by Secretary Hoover. One of the latest announcements made is that the Louisville Railway is prepared to offer substantial cash

*Striking Portrayal by Cartoonist of Philadelphia "Record" of Willingness of Mr. Mitten to Turn All Forms of Transportation to His Own Advantage*



awards for safety work and to send the most successful candidate among its employees to the convention of the American Electric Railway Association.

In New York Barron Collier conceived and carried out an elaborate safety parade with the hope of bringing home to the public the message of safety. In this parade memories were revived of the days

While accidents which occur in boarding and alighting and from causes other than in connection with automobiles have decreased, those in which automobiles are involved have in many places increased. In consequence, a number of companies have embarked in extensive safety campaigns by the education of their employees and pleas to motorists to help prevent accidents. With the employees, competitions between divisions have been arranged that are intended to promote the best safety results. The co-operation of the public has been solicited in many ways, as through encouragement in the organ-

of the horse car and the hoop skirt in several of the floats. These days of long ago were also revived to the residents of Paducah, El Paso and Salt Lake City by parades held in these cities, but the demonstrations were not made in connection with safety work.

Chicago has been studying the feasibility of subways for thirteen years and has spent \$821,459 in surveys and reports—and not a spadeful of earth turned yet. Activities of the Detroit Rapid Transit Commission during the first few months of 1925 were directed largely toward securing from the state legislature



authority to permit the city to proceed with the rapid transit system such as the city may elect. Los Angeles opened a short rapid transit line on Dec. 1. Much talk is heard about subway digging in smaller cities, but usually the economic obstacles to creating a self-supporting system in such cases appear to be nearly insurmountable. Perhaps the two most notable traffic surveys of the year were those by Mr. Beeler in Atlanta and by McClellan & Junkersfeld in Washington.

Manufacturer co-operation has always been given willingly in the electric railway industry. This is especially true at the present time. One of the notable contributions during the year was the study made by Victor Angerer, vice-president of William Wharton, Jr., & Company. On his own account Mr. Angerer made a survey of the industry, the result of which he later permitted to be made available to the industry through a comprehensive article published in the JOURNAL for April 4, page 533. There was the usual Wickwire contribution at the Atlantic City convention. Also on that occasion Charlie Peirce came out of hiding as a speechmaker and made impromptu at a Transportation & Traffic Association session one of the best talks of the whole meeting.

Mr. Peirce knows a lot about the business. He ought to. He has been in the selling end for 35 years. He didn't come to pose as an expert—a plain ordinary man away from home. Not only did he agree with Mr. Queeney about taxicabs in Philadelphia, but he would even supply the public roller skates if they wanted them. His idea was to get the gross up and then take care of it. He had no sympathy with cheeseparing. A salesman all his life, Mr. Peirce defied any man to continue selling anything, transportation not excluded, that was not made attractive.

#### SOME SIGNIFICANT LEAVE-TAKINGS

In the political arena there were a number of significant leave-takings. New York took leave of Mayor Hylan. He was eliminated in the primaries following the condemnatory report presented by Governor Smith's special commissioner who placed the seven-year delay in subway work at the Mayor's door. In this report the New York Transit Commission was exonerated. James F. Jackson, chairman of the board of trustees of the Boston Elevated Railway, resigned, due, as the

*Transcript* put it, to "the summary treatment of the trustees by the Governor in his statement threatening them with discharge if they 'permitted' a strike of the car men." In the stand that he took Governor Fuller virtually reversed the policy of the trustees. Later the Governor reversed his stand.

Out in Detroit Mayor Smith paid his political respects to Ross Schram, manager of the Detroit Municipal Railway, by instructing the local Street Railway Commission to dismiss Mr. Schram and to remove I. N. Merritt as auditor. Mr. Wilcox re-



Belated Justice in New Haven Case—Much Too Often Scales Are on the Eyes of Justice Instead of in Her Hands

signed about the same time as claims attorney for the railway.

Speaking of the municipal systems the city of San Francisco rejected at the recent election the purchase proposal under which the Market Street Railway would have been taken over. Incidentally, the San Francisco Municipal Railway was operated at a loss of \$295,230 for the year ended June 30, 1924, the latest official figure available. The excess of income over operating expenses and reserves actually was \$8,374, but this figure took no account of taxes and similar items amounting to \$303,604. This is a commentary on the inadequacy of the 5-cent fare. On the other hand, Seattle piled up a profit of \$557,243 for the year 1924 compared with \$169,636 in 1923. This was done under the 10-cent cash fare with three tokens for 25 cents, a rate reached after experimenting.

The politicians, led by Mayor

Schwab of Buffalo, have certainly kept Mitten Management from attaining the rehabilitation of that property. Little attention was paid locally to warnings about the inadvisability of allowing a 5-cent bus company to compete with the International until a disinterested committee reported adversely on the proposition. The politicians of St. Paul and Minneapolis have finally seen the light and have entered into an arrangement with the railway for a settlement that could have been effected just as easily at the inception of the controversy had the men elected locally to public office assumed a different attitude. Because public authorities kept their eyes on political expediency and not on economic needs a decree was entered in 1914 requiring the New Haven Railroad to sell its New England trolleys. These now go back to that property under the decree of Judge Winslow rendered on Nov. 21. Meanwhile, however, the Rhode Island lines passed into the hands of a receiver and so are lost to the New Haven at a cost of many millions of dollars and no benefit to the public. In Pennsylvania the Supreme Court overruled the removal of Public Service Commissioners Benn and Shelby, summarily dismissed by Governor Pinchot last August during the progress of the Philadelphia Rapid Transit fare hearing. Much too often, however, scales are on the eyes of Justice instead of in her hands.

During the year the courts and commissions upheld the use of one-man cars in Buffalo, Milwaukee, Dayton, Worcester, New Haven and Nashville. Public Service Railway of New Jersey is now operating practically 100 per cent with one-man cars.

And so this desultory account has run on to the extent of six pages. But Montaigne very aptly said that "the world is nothing but babbling and words," after which he himself went babbling. Remember that the great Burke, frightened by the thunders of change all about him, turned back to the past, while Thomas Paine, thrilled by the same thunders, saw a dawn and proclaimed a hopeful future. The harder the conflict the more glorious the triumph. A better outlook depends in a large measure on a better lookout. When it puts away discouraging prophets this business will put away encouraging profits.



# Issues of Merit Easy to Sell

**Total of Financing in 1925 Not Large Compared with Recent Years, but Companies with Good Operating Records Experienced No Difficulty in Finding a Market for Their Issues at Reasonable Rates—Need Is Imperative for Recasting Many Financial Structures**

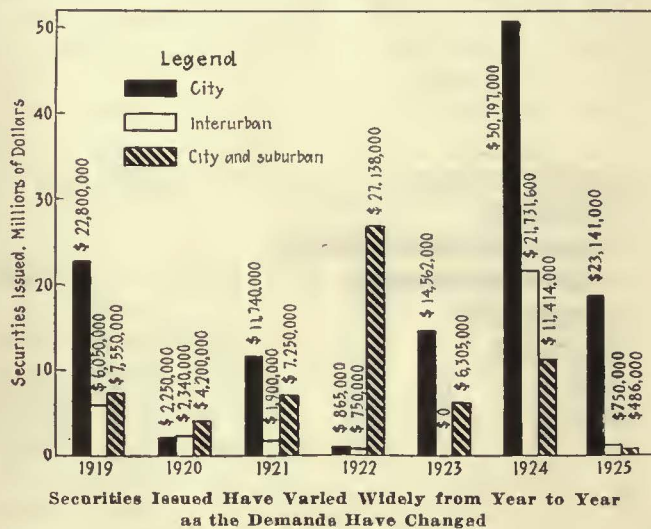
**H**OUSES of issue which in recent years have sold electric railway bonds to the public report that issues of real merit are much easier to sell to the public than were similar issues two years ago. Unfavorable sentiment which existed for a long time is no longer as evident as it was. This is attributed to the general improvement in the railway situation, but more particularly to the eradication from the mind of the public that the bus is destined to replace the railway. This change in sentiment is due to the publicity that has attended the willingness of the railways to turn the bus to their own advantage.

In this connection investment bankers point out that the situation in the electric railway industry as regards competition and changes in the fundamental aspects of the business have not been very different from similar conditions with which industrials have had to contend. There is, however, this notable exception, namely, that the industrials are not subject to the service restrictions which have been placed on the railways with respect to the conditions under which the two function. The railway that has found a solution of the bus problem is, of course, in a much better position to do its financing on better terms than is the company which has not solved that problem. In fact, new financing is approached by the banker on the basis of such solution having been found.

Over and over again bankers referred to the report of the advisory committee on electric railway finance, presented at the convention of the American Electric Railway Association, as stating concretely their attitude toward the whole problem. As they see it, the problem is one in which a proper balance must be struck among the engineering, operating and financial sides of the business. It is notorious that most electric railways are badly financed as regards the proportion of the bonded debt to the fair value of the property. The feeling of the bankers is that until the recent report was presented at Atlantic City nobody had suggested any remedy for the railways except more business. More business is highly desirable, but it is realized by the bankers that

no amount of merchandising or skill in operation will correct a financial situation that is inherently unsound.

The thing to do is to clean house. This seems at first severe, but is it? Eventually the situation becomes untenable. It becomes untenable because the cost of new money exceeds the return on it that can be earned. Money costs vary with the hazard that is involved. Thus to a company that is earning its in-



terest twice the cost would be 6 per cent. With a lower earning ratio the cost goes up on a constantly increasing scale to the point where it would be 10 per cent if interest were earned only 1.20 to 1.35 times. In other words, as the bankers point out and as the committee has emphasized, where a company is earning only a small margin over fixed charges, three important factors militate against it:

1. Where money can be raised at all for necessary capital expenditures, it can usually be done only at a cost greater than the return the money is likely to earn.
2. Where the operation is a refunding one, the new obligations, not even considering the general state of

## Details of New Bond and Note Financing in Amounts of More than \$200,000 Offered Publicly During 1925

Issue	Price	Maturity	Yield	Amount
JANUARY				
Brooklyn City Railroad-Equipment Trust Certificates.....	.....	1926-35	4.50-5.50	\$3,750,000
Chicago, Aurora & Elgin Railroad 2-year 6½ notes.....	100 and interest	1927	6½	750,000
Reading Transit Company first and refunding gold Series A 6's.....	98 and interest	1954	6.15	1,250,000
FEBRUARY				
Eastern Mass. St. Railway Refunding Mortgage Series A 4½.....	.....	.....	7.0	(block)
Worcester Consolidated Street Ry. 1st and refunding gold 4½'s.....	.....	.....	.....	2,116,000
MARCH				
Philadelphia Rapid Transit gold 6's.....	99 and interest	1962	6.06	8,975,000
JUNE				
Norfolk & Portsmouth Traction First Mortgage 5's.....	98½ and interest	.....	.....	486,000
AUGUST				
Gary Railways First Refunding 6½'s.....	96 and interest	1945	6.75	550,000
OCTOBER				
Cincinnati Street Railway 1st 6's.....	100 and interest	1928	6.00	4,500,000
DECEMBER				
Chicago Rapid Transit Company first and refunding mortgage 6½'s.....	95 and interest	1944	6.98	2,000,000
Total.....	.....	.....	.....	\$24,877,000



the money market, will bear a higher rate than did the one maturing.

3. Companies in either of these positions, even if they are able to borrow on a mortgage, will not be able to raise any new capital by the sale of stock.

There is no blinking the facts. There has been considerable financing of electric railways during the last five years on terms that were very favorable to the borrowers, but these instances were by companies strategically situated with favorable records of earnings in the past and under management known the country over for its progressive attitude. For the others the only way out, except at terms in themselves prohibitive, is by revamping the capital structure. The bankers have said quite definitely that an improper, antiquated and rigid financial structure is usually a greater hindrance than an antiquated engineering structure or plant. In either case the management does not have at hand tools sufficiently flexible and convenient to permit satisfactory operation.

It has been said before that a situation similar to that in the electric railway field has existed in other industries. It has. Witness the high rates paid only a few years ago by industrials with good credit ratings. for the new money they needed. Be-

cause of their strategic earning position, however, many of these companies have refunded the issues so put out, paid some of them in part or paid them in full. The very nature of the utility business does not permit a surplus to accrue that makes it possible to retire issues either in part or in full out of earnings. There is all the more need for some managements resolutely to face the facts and to put their financial houses in order. Voluntary readjustment is never easy to accomplish. The recent case of the Detroit United Railway is an instance in point. That road appears to be working out its own salvation under receivership, but the stockholders with the prospects before them of an assessment of more than \$30 a share to protect an equity appraised market-wise at \$4 a share did not consent to the levy in numbers sufficient to keep the property in their own hands.

So far as the maturities for the new year go, they total \$26,644,790 compared with \$28,224,000 in 1925. Incidentally this table of maturities indicates the rates at which financing was done 25 or 30 years ago under favorable economic conditions, with paving and franchise terms not then onerous and with wages averaging about 21 cents an hour compared with about 65 cents now. The contrast is a striking one. As for the amount of bonds now in default the total of about \$200,000,000 appears to be imposing, but it is not so when the conditions of the last few years are considered and the figure is weighed in the light of the total of \$6,000,000,000 invested in the industry. Even allowing for the roads that have come out of receivership recently the list shows strikingly the type of road hit hardest.

In one respect banking opinion appears to be divided. That is on the equipment trust. It is agreed that so far as freight equipment is concerned the ability of the companies to borrow against such equipment would be helped materially by standardization of design such as

**Seven-Year Record of New Electric Railway Financing Involving Bond or Note Issues of More than \$500,000**

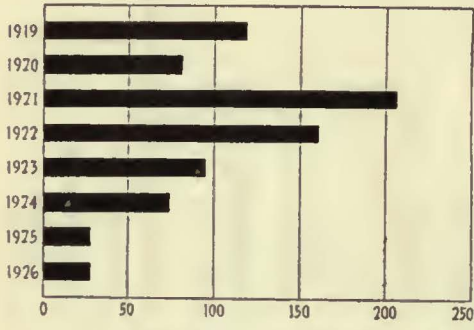
	City Railway	Interurban	City and Suburban
1919.....	\$22,800,000	\$6,050,000	\$7,550,000
1920.....	2,250,000	2,340,000	4,200,000
1921.....	11,740,000	1,900,000	7,250,000
1922.....	865,000	750,000	27,138,000
1923.....	14,562,000		6,305,000
1924.....	50,797,000	21,731,600	11,414,000
1925.....	23,141,000	750,000	486,000

**Comparison of Maturities in the Electric Railway Field**

1926.....	\$26,644,790	1922.....	\$160,015,860
1925.....	28,224,000	1921.....	207,617,530
1924.....	73,051,600	1920.....	80,466,100
1923.....	94,851,800	1919.....	116,785,500

**Principal Electric Railway Maturities in 1926 Based on Dow, Jones & Company's Compilation**

	Rate	Amount
<b>January</b>		
Niagara Falls & Suspension Bridge Railway, 1st.....	6	\$488,000
Interborough Rapid Transit Company, equipment trusts, B....	6 1/2	450,000
Eastern Massachusetts Street Railway serial.....	6	300,000
Lowell & Fitchburg Street Railway 1st.....	5	275,000
Oklahoma Railway junior mortgage.....	6	260,000
Brooklyn City Railroad equipment trusts A.....	5	375,000
		\$2,148,000
<b>February</b>		
Peoria Railway refunding.....	5	\$1,754,000
Detroit, Ypsilanti, Ann Arbor & Toledo Ry. consolidated.....	5	1,610,000
Detroit, Ypsilanti & Ann Arbor Railway, consolidated.....	6	330,000
Fitchburg & Leominster Street Railway consolidated.....	7	300,000
Philadelphia Rapid Transit Company, equipment trust G.....	5 1/2	237,500
Pittsburgh Railways car trust.....	6	200,000
Western Massachusetts Street Railway 1st.....	5	200,000
		\$4,631,000
<b>March</b>		
Interborough Rapid Transit Company equipment trust, A....	6	\$280,000
Clinton Street Railway 1st.....	5	400,000
		\$680,000
<b>April</b>		
Kankakee Electric Railway 1st.....	6	\$200,000
Rockville, Broad Brook & Eastern Windsor Railway.....	5	200,000
		\$400,000
<b>May</b>		
Indiana, Columbus & Eastern Traction refunding.....	5	\$6,400,000
North Hudson County Railway ext.....	6	1,291,000
West Philadelphia Passenger Railway 2nd.....	5	750,000
Wheeling & Western 1st.....	5	235,000
		\$8,676,000
<b>June</b>		
Roxboro, Chestnut Hill & Norris Railway.....	5	\$371,000
Detroit & Pontiac Railway consolidated.....	4 1/2	362,000
Shawnee-Tecumseh Traction 1st.....	5	300,000
Goff Falls, Litchfield & Hudson Railway 1st.....	5	200,000
Frostburg, Eekenington & Cumberland 1st.....	5	230,000
Lonaconing, Midland & Frostburg Railway.....	5	200,000
		\$1,663,000
<b>July</b>		
Grand Rapids, Grand Haven & Muskegon 1st.....	5	\$1,500,000
Brunswick Traction gold.....	5	500,000
		\$2,000,000
<b>August</b>		
Brownville Avenue Street Railway, (Pittsburgh), 1st.....	5	\$300,000
Philadelphia Rapid Transit equipment trust G.....	5 1/2	237,500
Worcester & Blackstone Valley Railway.....	4 1/2	200,000
		\$737,500
<b>September</b>		
None		
<b>October</b>		
United Railways, St. Louis, receiver's certificates.....	6	\$4,200,000
		\$4,200,000
<b>November</b>		
Interborough Rapid Transit equipment trust C.....	6	\$570,000
		\$570,000
<b>December</b>		
Chicago, Aurora & Elgin Railroad two year.....	6 1/2	\$750,000
Philadelphia Rapid Transit equipment trust H.....	5 1/2	759,290
		\$1,509,290
<b>Total of all public utilities:</b>		
1926.....		\$26,644,790
1925.....		\$28,224,000



Maturities in This Year Are Less Than at Any Time Since the War



is now being attempted by the roads in the Central West, but some bankers do not hold to the same views about passenger equipment. The definite position is taken by one of the largest houses of original issue that the ability of the management, the record of earnings of the past, the political situation and the degree of co-ordination of bus and trolley service would be the sole basis upon which it would judge a proposal to sell equipment trust obligations to the public. Of course, it would not stand sponsor for an issue of bonds secured by a type of car that might be considered a freak, but the type of car would be incidental to the other factors. On the other hand, other houses of issue while weighing all the points previously mentioned would be guided to a very large extent by the suitability of the equipment for use in an emergency in a city other than the one for which it was originally intended. There is no need here to stress the favor with which steam railroad equipment trust obligations are regarded. The fields differ greatly in extent, but it is generally felt

that the electric railways have much to learn from the steam railroads in this respect.

Lastly it is of interest to note the extent of the recognition received by the report of the advisory committee on electric railway finance. Not in just the words of the committee, but over and over again representatives of banking houses gave expression in their own words to the opinion so ably expressed by the committee in its report to the effect that there are too many examples of electric railway properties which have been revitalized by new managements and new technical equipment, by recasting financial structures, and by modernized methods of salesmanship, for anyone to conclude in any way other than that the electric railway industry is fundamental and that its troubles have been the result of a combination of unprecedented and uncontrollable economic factors. Bankers expect that the financial problem, in those cases where it is a problem, will be attacked with the courage with which the other railway problems are now being attacked.

# Track Extensions Show Substantial Gain Over Previous Years

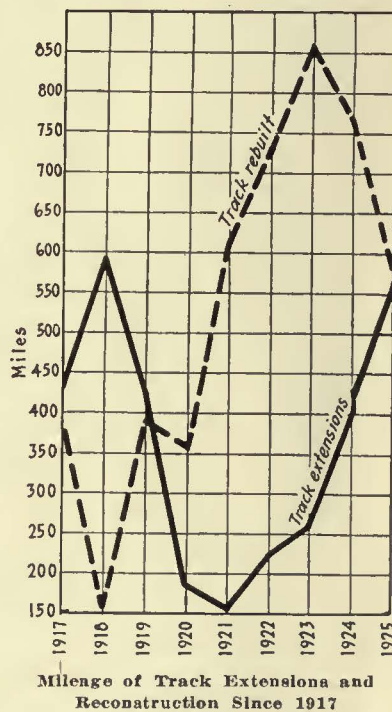
Electric Railway Mileage Added During Past Twelve Months Is Larger than in Any Other Year Since 1918—Extensions to City and Interurban Trackage Show Increases Over 1924 — More than Twice as Much Steam Railroad Mileage Was Electrified

FOR the fourth successive time, the mileage of new electric railway track added during the year exceeded that of the preceding twelve-month period. New track added during 1925 was approximately 340 miles. Extensions to city trackage amounted to a little more than 225 miles, a gain over 1924 and the largest figure since 1917. Interurban extensions totaled about 112 miles, a substantial increase over the preceding year and also the largest figure since 1917. Electrification of steam railroad lines, amounting to somewhat over 230 miles, was more than double that of the year before. Thus the total of all extensions was approximately 580 miles, or more than for any other year since 1918.

Most notable were the extensions to city track mileage in the Central, Southern, and Western states, each of which group added more urban trackage in 1925 than in the previous year. The Central and Southern groups also added more interurban mileage during the past twelve months than they did the year before. In the

Western group, however, the new interurban mileage was less than in 1924. Extensions in the New England and Eastern states and in Canada totaled somewhat less for 1925 than for the preceding year.

The largest single extension made during the year was an addition of 56 miles to the interurban trackage of the Chicago, North Shore & Milwaukee Railroad, involving the construction of the Waukegan cut-off. Plans for this undertaking were described in considerable detail in the



Summary of Track Construction for 1925

	New England States	Eastern States	Central States	Southern States	Western States	Canada	Grand Total
<b>Track Extensions</b>							
No. of companies...	6	17	30	11	26	10	103
Miles of urban track	4,554	27,265	72,705	24,006	52,111	46,671	227,312
Miles of interurban track.....	0,559	8,906	64,449	12,527	22,862	3,180	112,483
<b>Total miles built.</b>	<b>5,113</b>	<b>36,171</b>	<b>137,154</b>	<b>36,533</b>	<b>74,973</b>	<b>49,851</b>	<b>339,795</b>
<b>Track Reconstruction</b>							
No. of companies...	15	44	61	17	27	15	179
Miles of urban track	54,861	149,925	155,646	34,504	65,210	25,600	485,746
Miles of interurban track.....	23,165	27,978	26,916	1,000	11,126	2,970	93,155
<b>Total miles rebuilt</b>	<b>78,026</b>	<b>177,903</b>	<b>182,562</b>	<b>35,504</b>	<b>76,336</b>	<b>27,480</b>	<b>578,901</b>

issue of ELECTRIC RAILWAY JOURNAL for July 26, 1924.

Electrification of steam railroad lines was carried out by five companies. In point of mileage the largest enterprise of this kind was that of the Staten Island Rapid Transit Company, a subsidiary of the Baltimore & Ohio Railroad, approximately 56 single-track miles being changed over to electric operation. The Babylon



Track Built and Rebuilt During 1925

Name of Company	Extension Miles		Rebuilt Miles		Name of Company	Extension Miles		Rebuilt Miles	
	City	Interurban	City	Interurban		City	Interurban	City	Interurban
<b>Connecticut</b>					<b>Indiana</b>				
Connecticut Co.....	1.694	0.126	11.167	2.831	Indianapolis St. Ry.....	1.637	.....	28.330	.....
<b>Maine</b>					<b>Iowa</b>				
Bangor Railway & Electric Co.....	.....	.....	0.920	.....	Indianapolis & Cincinnati Trac. Co....	.....	0.580	1.750	0.500
Biddeford & Saco Railroad.....	.....	.....	.....	0.500	Interstate Public Service Co.....	0.300	.....	.....	.....
Cumberland County Pr. & Lt. Co.....	.....	.....	1.858	.....	Northern Indiana Power Co.....	.....	.....	0.142	.....
York Utilities Co.....	.....	.....	0.663	0.757	Southern Indiana Gas & Elec. Co.....	1.300	.....	1.700	.....
<b>Massachusetts</b>					<b>Kentucky</b>				
Berkshire St. Ry.....	.....	.....	0.725	1.604	Union Traction Co. of Indiana.....	0.200	.....	.....	1.100
Boston Elevated Railway.....	0.700	.....	11.500	.....	<b>Iowa</b>				
Eastern Massachusetts St. Ry.....	0.330	.....	8.000	3.264	Clinton, Davenport & Muscatine... Ry.....	.....	0.800	.....	.....
Middlesex & Boston St. Ry.....	.....	.....	5.000	.....	Des Moines City Ry.....	0.270	.....	0.110	.....
New Bedford & Onset St. Ry.....	.....	.....	.....	1.150	Dubuque Electric Co.....	.....	.....	0.132	.....
Springfield St. Ry.....	0.195	0.263	3.428	2.899	Iowa So. Utilities Co., Burlington....	21.00	.....	0.500	.....
Union St. Ry., New Bedford.....	.....	.....	1.000	6.000	Sioux City Service Co.....	.....	.....	5.000	.....
Worcester Consolidated St. Ry.....	.....	.....	0.500	1.600	Tri-City Ry. of Iowa.....	0.190	.....	0.100	.....
<b>Rhode Island</b>					<b>Michigan</b>				
Newport Elec. Corp.....	0.095	.....	.....	.....	Cincinnati, Newport & Covington... Ry.....	.....	.....	0.580	.....
United Electric Rys., Providence....	1.540	0.170	8.100	2.560	Kentucky Trac. & Terminal Co.....	.....	.....	1.180	.....
<b>Vermont</b>					<b>Missouri</b>				
Springfield Terminal Ry.....	.....	.....	2.000	.....	Louisville Ry.....	.....	.....	1.830	.....
Total.....	4.554	0.559	54.861	23.165	<b>Ohio</b>				
<b>District of Columbia</b>					<b>Minnesota</b>				
Capital Traction Co.....	.....	.....	1,205	.....	Duluth St. Ry.....	.....	.....	3,490	.....
Washington Ry. & Elec. Co.....	.....	.....	7,580	.....	Mankato Elec. Traction Co.....	.....	.....	0,227	.....
Washington-Virginia Ry.....	.....	.....	0,340	.....	Minneapolis St. Ry.....	1,808	.....	6,020	.....
<b>Maryland</b>					<b>Missouri</b>				
Potomac Edison Co.....	0.550	.....	0.417	.....	St. Paul City Ry.....	1,619	.....	4,230	.....
United Rys. & El. Co.....	.....	.....	17,000	.....	<b>Ohio</b>				
<b>New Jersey</b>					<b>Wisconsin</b>				
Central Passenger Ry.....	.....	.....	1,000	.....	Lake Superior District Ry.....	.....	.....	1,990	.....
Morris County Trac. Co.....	.....	.....	2,272	.....	Madison Railways.....	.....	.....	0,303	.....
Ocean City Elec. R.R.....	.....	.....	1,117	.....	Milwaukee Elec. Ry. & Lt. Co.....	1,770	.....	12,683	1,105
Trenton & Mercer Cty Trac. Corp....	0.390	.....	0,570	0,960	Milwaukee Northern Ry.....	.....	.....	0,500	.....
Trenton-Princeton Traction Co.....	.....	.....	0,500	.....	Northern States Power Co.....	.....	.....	1,000	.....
<b>New York</b>					<b>Wisconsin</b>				
Binghamton Ry.....	.....	.....	.....	1,430	Wisconsin Pwr. & Lt. Co.....	.....	.....	2,550	1,510
Brooklyn City R.R.....	.....	.....	9,685	.....	Wisconsin Valley Elec. Co.....	.....	.....	0,644	.....
Brooklyn-Manhattan Trans. Corp....	1,153	.....	13,115	.....	<b>Alabama</b>				
Elmira Water, Lt. & R.R.....	.....	.....	0,333	.....	Alabama Power Co.....	1,165	.....	1,514	.....
Empire State R.R.....	.....	.....	0,680	.....	Birmingham Elec. Co.....	0,120	12,500	.....	.....
Fonda, Johnstown & Gloversville... R.R.....	.....	.....	0,300	.....	Mobile Light & R.R. Co.....	.....	.....	1,360	.....
Hamburg Ry.....	.....	.....	1,500	0,600	<b>Arkansas</b>				
Interborough Rapid Transit Co.....	4,210	.....	.....	.....	Arkansas Central Pwr. Co.....	.....	.....	4,77	.....
International Ry.....	0,250	0,440	0,230	.....	Intercity Terminal Ry.....	1,24	.....	.....	.....
Jamestown St. Ry.....	.....	.....	1,500	.....	<b>Florida</b>				
New York & Queens County Ry.....	9,000	.....	.....	.....	Pennacola Electric Co.....	.....	0,027	.....	.....
New York State Rys.....	0,190	.....	9,020	.....	St. Johns Electric Co.....	3,180	.....	1,560	.....
Rochester & Syracuse R.R.....	.....	.....	0,370	.....	Tampa Electric Co.....	.....	.....	3,000	.....
Schenectady Ry.....	0,350	.....	2,250	.....	<b>Georgia</b>				
Southern New York Ry.....	.....	.....	.....	1,000	Columbus Elec. & Pwr. Co.....	.....	.....	0,190	.....
United Traction Co., Albany.....	.....	.....	1,795	.....	Georgia Ry. & Pwr. Co.....	2,845	.....	6,50	.....
<b>Pennsylvania</b>					<b>Georgia</b>				
Allegheny Valley St. Ry.....	.....	.....	.....	0,178	Macon Ry. & Lt. Co.....	.....	.....	1,100	.....
Altoona & Logan Val. Elec. Ry.....	.....	.....	2,610	.....	Savannah Elec. & Pwr. Co.....	0,630	.....	0,230	.....
Boaver Valley Traction.....	.....	.....	1,326	.....	<b>Louisiana</b>				
Buffalo & Erie Ry.....	.....	.....	0,060	.....	Municipal St. Ry. Monroe.....	8,000	.....	0,340	.....
Erie Rys.....	.....	.....	0,511	.....	New Orleans Public Service, Inc....	3,466	.....	4,500	.....
Harrisburg Rys.....	.....	.....	1,170	.....	Shreveport Rys.....	1,530	.....	.....	.....
Hershey Transit Co.....	1,400	.....	.....	.....	<b>North Carolina</b>				
Lehigh Traction Co.....	.....	.....	0,295	.....	Carolina Pwr. & Lt. Co.....	.....	.....	0,400	.....
Lehigh Valley Transit Co.....	.....	5,880	4,700	0,590	Durham Public Service Co.....	.....	.....	0,310	.....
Meyersdale El. Lt., Ht. & Pr. Co....	.....	0,500	1,000	6,500	<b>South Carolina</b>				
Oley Valley Ry.....	.....	.....	.....	1,500	Charleston Consolidated Ry. & Ltg. Co.	.....	.....	1,310	.....
Philadelphia Rapid Transit Co.....	2,297	0,212	26,085	.....	<b>Tennessee</b>				
Pittsburgh Rys.....	5,225	0,317	20,527	3,290	Memphis St. Ry.....	1,830	.....	5,420	.....
Reading Transit Co.....	2,200	0,600	5,900	2,000	Tennessee Electric Power Co.....	.....	.....	2,000	.....
Schuylkill Ry.....	.....	.....	4,000	2,000	Union Traction Co., Nashville.....	.....	.....	.....	1,000
Seranton Ry.....	.....	.....	3,610	3,020	<b>Total</b>				
Webster, M., B. V. & F. C. St. Ry....	.....	.....	2,000	.....	Total.....	24,006	12,527	34,504	1,000
West Penn Rys.....	.....	0,407	.....	4,910					
York Rys.....	0,050	.....	0,352	.....					
<b>Virginia</b>									
Roanoke Ry. & Elec Co.....	.....	0,550	.....	.....					
<b>West Virginia</b>									
Princeton Power Co.....	.....	.....	1,00	.....					
Wheeling Public Service Co.....	.....	.....	1,500	.....					
Total.....	27,265	8,906	149,925	27,978					
<b>Illinois</b>									
Alton Granite & St. Louis Trac. Co....	.....	.....	0,256	.....					
Chicago North Shore & Milwaukee... R.R.....	0,208	56,683	.....	3,258					
Chicago Rapid Transit Co.....	10,130	.....	7,800	.....					
Chicago Surface Lines.....	3,670	.....	10,100	.....					
Chicago & Joliet Elec. Ry.....	.....	.....	0,750	0,300					
Chicago & West Towns Ry.....	.....	.....	2,092	.....					
East St. Louis Ry.....	0,284	.....	0,640	.....					
East St. Louis & Suburban Ry.....	.....	.....	.....	1,000					
Illinois Power Co.....	.....	.....	1,750	.....					
Illinois Traction, Inc.....	.....	2,000	.....	1,200					
Rockford City Traction Co.....	.....	.....	0,700	.....					
St. Louis & Belleville Elec. Ry.....	.....	.....	.....	0,663					
Tri-City Ry. of Illinois.....	.....	.....	0,170	.....					



Track Built and Rebuilt During 1925—(Concluded)

Name of Company	Extension Miles		Rebuilt Miles		Name of Company	Extension Miles		Rebuilt Miles	
	City	Interurban	City	Interurban		City	Interurban	City	Interurban
<b>California</b>					<b>Washington</b>				
Key System Transit Co.			13.840	0.170	Grays Harbor Ry. & Lt. Co.			0.142	
Los Angeles Ry.	3.900		1.000		Puget Sound Int'l Ry. & Pwr. Co.		0.227		
Market St. Ry.	0.546		4.274	0.076	Seattle Munic St. Ry.	6.134		3.040	
Municipal Ry. of San Francisco	5.260		0.500		Spokane United Rys.			1.750	
Pacific Elec. Ry.	0.920	11.390	5.870	8.910	Tacoma Ry. & Pwr. Co.			2.000	
Peninsular Ry.	0.025		0.410		<b>Total</b>	<b>52.111</b>	<b>22.862</b>	<b>65.210</b>	<b>11.126</b>
Petaluma & Santa Rosa R.R.		0.52			<b>CANADA</b>				
Sacramento Northern R.R.		1.73			<b>Alberta</b>				
San Diego Elec. Ry.	3.240				Lethbridge Municipal Ry.			0.947	
San Francisco, Napa & Calistoga Ry.		1.400			<b>British Columbia</b>				
Santa Barbara & Suburban Ry.			0.205		British Columbia Elec. Ry.	1.780		0.700	
<b>Colorado</b>					<b>Manitoba</b>				
Denver & Intermountain R.R.		0.017			Brandon Municipal St. Ry.			1.000	
Denver Tramway	1.033	0.293	6.488	0.016	Winnipeg Elec. Co.	2.370		0.380	
Fort Collins Municipal Ry.	0.500				<b>New Brunswick</b>				
<b>Kansas</b>					New Brunswick Pwr. Co.				
Topeka Ry.			0.759					2.250	
<b>Nebraska</b>					<b>Ontario</b>				
Lincoln Traction Co.			0.265		Cornwall St. Ry.			0.500	
Omaha & Council Bluffs St. Ry.			6.000		Hydro-Electric Rys.	5.600		1.110	
Omaha, Lincoln & Beatrice Ry.	0.150		0.380		London St. Ry.			0.519	
<b>New Mexico</b>					Niagara, St. Catharines & Toronto Ry.				
Las Vegas Transit Co.			0.500			0.587		0.617	
<b>Oklahoma</b>					Ottawa Electric Ry.				
Northeast Oklahoma R.R.		2.452				4.820		1.510	
Oklahoma Ry.		1.500	0.8		Toronto Transportation Com.	16.465		1.541	
Oklahoma Union Ry.	1.500		0.500		<b>Quebec</b>				
Pittsburg County Ry.	0.682	0.133		0.284	Hull Electric Co.	0.100			
<b>Oregon</b>					Montreal Tramways				
Portland Elec. Pwr. Co.	4.180		2.110			14.350	3.180	12.180	2.970
<b>Texas</b>					Quebec Ry., Lt. & Pwr. Co.				
Dallas Ry.	8.959					0.580		0.786	
Eastern Texas Electric Co.	0.210		0.137		Sherbrooke Ry. & Pwr. Co.			0.470	
El Paso Electric Ry.	0.057		0.660		<b>Saskatchewan</b>				
Galveston Electric Co.			4.000		Moose Jaw Elec. Ry.			1.090	
Houston Electric Co.	1.315		2.660		Regina Municipal Ry.	0.019			
Laredo Electric Ry.	1.000					0.019		1.090	
Northern Texas Traction Co.			6.300	1.290	<b>Total</b>	<b>46.671</b>	<b>3.180</b>	<b>25.600</b>	<b>2.970</b>
Wichita Falls Traction Co.	12.500	3.200	1.000		<b>Grand Total</b>	<b>227.312</b>	<b>112.483</b>	<b>485.746</b>	<b>93.155</b>

electrification of the Long Island Railroad involved about 54 track-miles. Other important undertakings were carried out by the Norfolk & Western Railroad, the Virginian Railway, and the New York, New Haven &

miles, or somewhat less than for the preceding year. The abandonments were about equally divided between urban and interurban. Nearly all of the interurban track abandoned was dismantled and removed, but a considerable part of the abandoned city trackage was allowed to remain in place.

Electrified Steam Line Extensions

	Single Track, Miles
Staten Island Rapid Transit Co. (Baltimore & Ohio System)	56.00
Long Island Railroad	54.00
Norfolk & Western Railroad	52.75
Virginian Railway	38.40
New York, New Haven & Hartford Railroad	35.21
<b>Total</b>	<b>236.36</b>

Some seventeen electric railways abandoned all their trackage and ceased rail operation entirely. These, however, were all comparatively small companies. So far as is known, no regular transportation service is now provided in these localities. The mileage of track totally abandoned in 1925 was about 50 miles less than the 1924 figure. Track rebuilt during the year was somewhat less than in 1924, totaling a little under 600 miles. In this figure, however, is not included a large amount of track on which considerable maintenance was done, but which was not entirely rebuilt.

Hartford Railroad. Mileages of these electrifications are given in an accompanying table.

Track abandoned during 1925 by electric railways which continued to operate elsewhere totaled about 240

Comparison of Track Construction by Years

Year	Extensions		Electrified Steam Lines	Total	Track Rebuilt
	No. of Companies	Urban Track			
1907	(a)	(a)		1,880.00	(a)
1908	757	1,174.5	84.00	1,258.50	(a)
1909	160	774.7	112.40	887.16	(a)
1910	217	1,204.8	192.40	1,397.20	(a)
1911	223	1,105.0	86.50	1,191.50	(a)
1912	171	869.4	80.80	950.20	(a)
1913	181	974.9	119.00	1,093.90	(a)
1914	163	716.5	229.00	946.40	(a)
1915	136	596.0	448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30
1917	121	251.10	125.60	66.00	442.70
1918	80	216.41	97.41	275.70	589.53
1919	73	110.90	29.67	287.60	428.17
1920	87	145.69	30.87	8.92	185.48
1921	78	108.15	38.95	8.08	155.18
1922	104	126.27	85.11	12.35	223.73
1923	272	169.61	63.54	26.16	259.31
1924	243	218.085	93.988	83.39	395.463
1925	207	227.312	112.483	236.36	576.155

Entire Properties Abandoned in 1925

Abila Light & Railway	1.00
Arkansas City-Winfield Northern Interurban Railway	20.50
Cleveland & Chagrin Falls Railway	12.00
Cleveland & Eastern Traction Company	40.00
Danville & Sunbury Transit Company	2.80
Gainesville Railway	10.00
Illinois Light & Traction Company	6.00
Jersey Shore & Antes Fort Railroad	2.75
Kentucky Utilities Company	3.30
Nassau County Railway	10.00
New Paltz, Highland & Poughkeepsie Traction Company	9.27
Skipack & Perkiomen Transit Company	13.00
Southeastern Ohio Railway	16.00
Troy & New England Railway	10.11
Valdosta Street Railway	5.25
Wapeton Breckenridge Street Railway	1.00
Waupaca Electric Service & Railway	5.21
<b>Total</b>	<b>174.19</b>

(a) Information not available.



Suspensions and Partial Track Abandonments During 1925

Includes All Pieces of Track Sidings, Yards, Etc., Permanently Abandoned—Companies Arranged Alphabetically by States

	—Miles of City Track—			Miles of Interurban Track				—Miles of City Track—			Miles of Interurban Track		
	Sus-pended	Aban-doned	Re-moved	Sus-pended	Aban-doned	Re-moved		Sus-pended	Aban-doned	Re-moved	Sus-pended	Aban-doned	Re-moved
<b>Connecticut</b>													
Connecticut Co.		8.706	2.276		69.801	0.430							
Hartford & Springfield St. Ry.				9.700									
New York, New Haven & Hartford R.R.						1.920							
<b>Maine</b>													
Central Maine Power Co. Cumberland County Pwr. & Light Co.				9.000									
<b>Massachusetts</b>													
Boston Elevated Ry.	17.203	6.630	1.400										
Boston & Worcester St. Ry.	6.000												
<b>Eastern Massachusetts</b>													
St. Ry.			.800			12.260							
Interstate St. Ry.				4.230	4.230								
New Bedford & Onset St. Ry.						16.000							
Plymouth & Brockton St. Ry.	7.000												
Springfield St. Ry.	1.320												
Worcester Consolidated St. Ry.					64.250								
<b>New Hampshire</b>													
Portsmouth Electric Ry.	7.650			10.330									
<b>Rhode Island</b>													
Newport Electric Corp.	4.700			20.000									
United Electric Rys.	1.580	1.580		7.100	7.100	20.660							
<b>Vermont</b>													
Bellows Falls & Saxtons River St. Ry.	2.000			4.000									
<b>District of Columbia</b>													
Washington Ry. & El. Co.	2.627		.260	5.619	1.600	3.250							
<b>Maryland</b>													
Cumberland & Western-port Elec. Ry.				16.600									
United Rys. & Elec. Co.			.500										
<b>New Jersey</b>													
Ocean City Electric R.R. Trenton & Mercer County Traction Co.		.500				5.670							
<b>New York</b>													
Auburn & Syracuse Elec. R.R.	1.900	1.900	1.900										
Black River Traction Co.		1.260											
Hornell Traction Co.				1.120	1.120	1.120							
International Ry.	8.820	5.110	.790										
Jamestown Westfield & Northwestern R.R.				8.000									
Kingston Consol. R.R.	3.500	3.500											
New York State Rys.				13.000									
New York & Queens County R.R.			9.510	3.150									
Olean, Bradford & Salamanca Ry.	.750	.750	.330	9.000	9.000								
United Traction Co.	6.159	6.159	4.373										
<b>Pennsylvania</b>													
Beaver Valley Trac. Co.	8.000												
Chambersburg & Gettysburg Elec. Ry.		2.000											
Chambersburg & Ship-pensburg Ry.				9.000									
Citizens Traction Co.				.500									
Harrisburg Rys.	.320												
Lehigh Valley Transit Co.				6.350	.930								
Masch Chunk & Lehigh-ton Transit Co.				4.000									
<b>Pennsylvania &amp; Maryland</b>													
St. Ry.	.170												
<b>Philadelphia Rapid Transit Co.</b>													
	2.913		12.340	3.879									
Pittsburgh Rys.	1.560	.033	2.426			.082							
Reading Transit Co.		1.100				.600							
Stroudsburg Traction Co.	.500	.500	.500										
West Penn. Rys.			.637										
York Rys.													
<b>West Virginia</b>													
Wheeling Pub. Serv. Co.		4.000											
<b>Illinois</b>													
Alton Granite & St. Louis Traction Co.					.019								
Aurora, Elgin & Fox River Electric Co.				8.910									
Bloomington, Pontiac & Joliet Elec. Ry.				2.000									
Central Illinois Public Service Co.				7.410									
Chicago North Shore & Milwaukee R.R.	.227												
Illinois Central Elec. Ry.				6.350									
Illinois Power & Light Corp., Galesburg.		2.600			.120								
Illinois Traction, Inc., Ill. Valley Div.	.330												
Tri-City Ry. of Illinois.			.110										
<b>Indiana</b>													
Terre Haute, Indianapolis & Eastern Trac. Co.				2.070									
<b>Iowa</b>													
Clinton, Davenport & Muscatine Ry.						.050							
Des Moines & Central Iowa R.R.						1.200							
<b>Iowa—Continued</b>													
Iowa Southern Utilities Co., Burlington.	2.500												
Iowa Southern Utilities Co., Centerville.	1.250												
Omaha & Council Bluffs Ry. & Bridge Co.					1.000								
Tri-City Ry. of Iowa.					.860								
<b>Kentucky</b>													
Paducah Ry.												.473	
<b>Michigan</b>													
Dept. of St. Rys., Detroit					.404								
Detroit United Ry.	4.700	4.700	.600	10.300	10.300	9.500							
Grand Rapids Ry.		.648											
Meamminee & Marquette Lt. & Trac. Co.				.735									
<b>Missouri</b>													
St. Louis Elec. Terminal Ry.	2.000			1.300									
United Rys. Co. of St. Louis.				1.000									
<b>Ohio</b>													
Cleveland Ry.	.668	1.859	.190										
Cleveland Southwestern Ry. & Lt. Co.						22.500							
Columbus, Urbana & Western Elec. Ry.					7.500								
Community Traction Co.	.510		.210										
Southern Ohio Public Service Co.	2.000												
Toledo, Fostoria & Findlay Ry.						12.000							
<b>Wisconsin</b>													
Milwaukee Elec. Ry. & Lt. Co.		1.317											
Wisconsin Pwr. & Lt. Co.	2.000												
<b>Alabama</b>													
Alabama Power Co.		.550											
<b>Florida</b>													
Jacksonville Traction Co.	4.550	4.550	4.550										
Key West Electric Co.	1.900												
St. Johns Electric Co.	4.110												
<b>Georgia</b>													
Columbus Electric & Pwr. Co.	5.920	5.920	5.920										
Georgia Ry. & Pwr. Co.	9.050	9.050											
Savannah Electric & Power Co.			.410										
<b>Louisiana</b>													
Louisiana Elec. Co., Inc.	2.650		2.650										
New Orleans Public Service, Inc.	1.621		3.696										
<b>Mississippi</b>													
Mississippi Power Co.	13.000												
<b>North Carolina</b>													
Durham Public Serv. Co.	4.100	4.100											
<b>South Carolina</b>													
Charleston Consolidated Ry. & Lt. Co.		.330				.011							
<b>Tennessee</b>													
Memphis St. Ry.			.110										
<b>California</b>													
Pacific Electric Ry.		12.180				2.020							
Petaluma & Santa Rosa R.R.						5.430							
San Diego Electric Ry.	1.510												
San Diego & Arizona Ry.						4.412						.761	
San Francisco Napa & Calistoga Ry.						1.400							
<b>Colorado</b>													
Denver Tramways.			2.590										
<b>Kansas</b>													
Arkansas Valley Inter-urban Ry.		2.000				.630							
Kansas City, Leaven-orth & Western Ry.	5.360		5.360										
Topeka Ry.	2.770	1.700	.345										
<b>Oklahoma</b>													
Northeast Oklahoma R.R.					.394							.394	
<b>Texas</b>													
Dallas Ry.			.422										
Eastern Texas Elec. Co.													
El Paso Electric Co.	.570												
Galveston Electric Co.		1.000	1.000										
Houston Electric Co.	1.090		1.274										
Rio Grande Valley Traction Co.						6.940							
Southwestern Traction Co.	.800	.800	.800										
<b>Washington</b>													
Grays Harbor Ry. & Lt. Co.	1.350												
Seattle Municipal St. Ry.	2.965												
Spokane United-Rys.		2.361	2.361										
<b>Canada</b>													
British Columbia Electric Ry.												24.440	
Hydro-Electric Rys.		.720											
Toronto Transportation Commission.		2.901											
Montreal Tramways.			2.030										
Quebec Ry. Lt. & Pwr. Co.	1.420	1.420	.710										
Totals.	165.593	114.224	85.319	245.444	127.671	122.870							



# Car Purchases During 1925 Were Below Requirements

Reduction in the Number of New Cars Ordered This Year Emphasizes the Importance of Directing Increased Attention to Replacement of Obsolete Equipment—New England Was the Only Section Reporting Increased Purchases Over Last Year

NEW car purchases during 1925 show a material reduction below previous years. The statistics of new rolling stock given in the tables and charts herewith indicate that electric railways have not only failed to buy equipment over a period of years at a rate sufficient to provide adequate replacements, but have seriously fallen behind their average during the past year. The need for directing increased attention to the subject of replacing obsolete equipment at a rate sufficient to keep pace with modern transportation standards thus becomes obvious. The total of 1,659 cars and electric locomotives ordered during 1925 is the second lowest recorded for any year since 1907. The lowest was in

Year	Passenger Cars		Total	Express, Freight, Service, Locomotives and Miscellaneous	Grand Total
	City	Interurban			
1921	1,059	129	1,188	88	1,276
1922	2,912	187	3,099	439	3,538
1923	2,915	427	3,342	687	4,029
1924	1,985	538	2,523	1,569	4,092
1925	1,054	320	1,374	285	1,659

1921 with a total of 1,276 cars and electric locomotives. Purchases of buses by electric railways, on the other hand, show a large increase over previous years. Detailed statistics on this subject are given in another article in this issue.

Information received from practically every electric railway in the United States and Canada shows

that there were 94 companies that bought new cars during 1925, but that the majority of purchases were confined to fifteen companies, which accounts for a total of 965 of the new passenger cars. The railways that purchased twenty or more cars are shown in Table III.

The special comparisons of types of cars which were purchased during 1925 as given in Table VI and in several of the diagrams show that for city service the one-man two-man type of car is being bought in greatest quantities. Cars for rapid transit service form 14.4 per cent of the orders, two-man cars 22 per cent, and the one-man car but 11.6 per cent. One of the charts illustrates in a very striking manner the rise and fall in popularity of the one-man car of approximately 28-ft. length which is commonly known as the safety car, and the rapid increase in popularity of the one-man two-man car which first made its appearance in 1922. For city service there were 512 one-man two-man cars purchased last year and 245 two-man cars. Motor cars for rapid transit service constitute the next greatest number, there being 160 of these. There were 129 one-man cars. Of this latter class, 55 were with bodies approximately 28 ft. long, 56 were single-truck cars with bodies longer

Table I—New Rolling Stock Ordered Since 1907

Year	Passenger Cars		Freight and Miscellaneous Cars	Electric Locomotives	Total
	City	Interurban			
1907	3,483	1,327	1,406	(a)	6,216
1908	2,208	727	176	(a)	3,111
1909	2,537	1,245	1,175	(a)	4,957
1910	3,571	990	820	(a)	5,381
1911	2,884	626	505	(a)	4,015
1912	4,531	783	687	(a)	6,001
1913	3,820	547	1,147	(a)	5,514
1914	2,147	384	479	(a)	3,010
1915	2,072	336	374	(a)	2,782
1916	3,046	374	491	31	3,942
1917	1,998	185	223	49	2,455
1918	1,842	255	278	44	2,419
1919	2,129	128	172	18	2,447
1920	2,889	227	465	17	3,598
1921	1,059	129	81	7	1,276
1922	2,912	187	405	34	3,538
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092
1925	1,054	320	238	47	1,659

(a) Included in "Freight and Miscellaneous Cars."

Table II—Special Comparison of New Rolling Stock Orders by Years

	1925	1924	1923	1922	1921	1920	1919	1918	1917	1916
Number of railways reporting new cars.....	94	119	167	145	94	172	160	140	182	250
<b>City Service</b>										
Number of one-man cars (28-ft. body S. T.).....	55	103	312	772	565	1,699	1,383	644	280	187
Number of one-man cars other than 28-ft. body.....	74	96	183	227	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars.....	512	1,224	1,076	471	.....	.....	.....	.....	.....	.....
Number of two-man passenger motor cars*.....	405	537	1,097	1,290	383	847	635	1,068	1,316	2,731
Number of passenger trailers.....	8	25	247	150	111	343	111	130	402	128
Service cars.....	70	44	121	103	47	104	31	(a)	(a)	(a)
<b>Total cars city service.....</b>	<b>1,124</b>	<b>2,029</b>	<b>3,036</b>	<b>3,015</b>	<b>1,106</b>	<b>2,993</b>	<b>2,160</b>	<b>1,842</b>	<b>1,998</b>	<b>3,046</b>
<b>Interurban Service</b>										
Number of one-man cars.....	3	61	56	40	.....	.....	.....	.....	.....	.....
Number of one-man, two-man cars.....	70	38	38	9	.....	.....	.....	.....	.....	.....
Number of two-man motor cars*.....	207	435	330	122	103	195	96	200	158	303
Number of passenger trailers.....	40	4	3	16	26	32	32	55	27	71
Number of freight, express and miscellaneous cars.....	168	1,494	474	302	34	361	141	(a)	(a)	(a)
<b>Total cars interurban service.....</b>	<b>488</b>	<b>2,032</b>	<b>901</b>	<b>489</b>	<b>163</b>	<b>588</b>	<b>269</b>	<b>255</b>	<b>185</b>	<b>374</b>
<b>Total number of cars.....</b>	<b>1,612</b>	<b>4,061</b>	<b>3,937</b>	<b>3,538</b>	<b>1,269</b>	<b>3,581</b>	<b>2,429</b>	<b>2,375</b>	<b>2,406</b>	<b>3,911</b>
Number of electric locomotives.....	47	31	92	34	7	17	18	44	49	31

\*Includes motor and trail cars for subway, elevated and train service. (a) Not available.



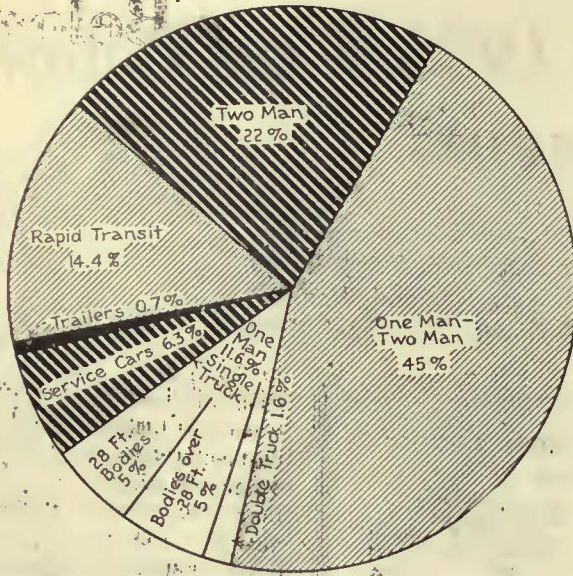
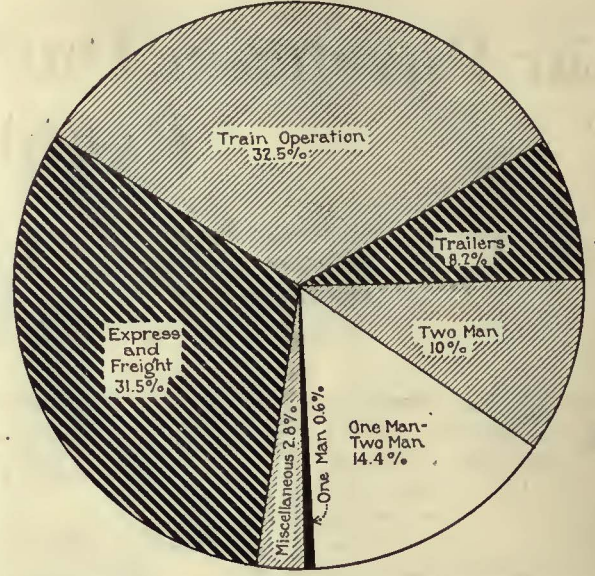


Diagram Showing the Proportion of Total City Cars for Each Type Purchased in 1925



This Shows the Various Types of Interurban Cars Purchased Last Year as a per Cent of the Total for This Class

Table III—Companies Purchasing 20 or More Passenger Cars

Boston Elevated Railway	100 surface cars and 60 rapid transit cars
Pittsburgh Railways	83 one-man two-man city cars and 20 one-man two-man interurban cars
Chicago Rapid Transit Company	100 motor cars for rapid transit service
Philadelphia Rapid Transit Company	100 one-man two-man surface cars
Baltimore & Ohio Railroad	90 motor cars and 10 trailers for rapid transit service
Cleveland Railway built	95 two-man cars in its shops
Georgia Railway & Power Company	40 one-man two-man city cars and 20 two-man cars
Key System Transit Company	42 city cars of two-man type
Chicago, South Shore & South Bend Railway	15 interurban passenger cars, 10 combination passenger and baggage cars, 2 parlor car trailers and 2 diner trailers
New York, New Haven & Hartford Railroad	13 motor cars and 22 trailers for train operation
Grand Rapids Railway	27 one-man two-man city cars
United Electric Railways of Providence	25 one-man two-man city cars
Chicago, North Shore & Milwaukee Railway	20 interurban motor cars and 4 diner trailers
Market Street Railway, San Francisco, built	24 two-man city cars
Columbus Railway & Power Company	23 two-man city cars
United Railways of Baltimore	22 one-man two-man city cars
Manila Electric Railway	20 two-man city cars

than 28 ft., and eighteen of these one-man units were double-truck cars.

The analysis of cars bought for interurban service shows that those purchased for train operation constitute the greatest number, there being 158 motor cars and 40 trailers or more than 40 per cent of the total interurban passenger cars purchased. Next to these, the one-man two-man type of car proved most popular.

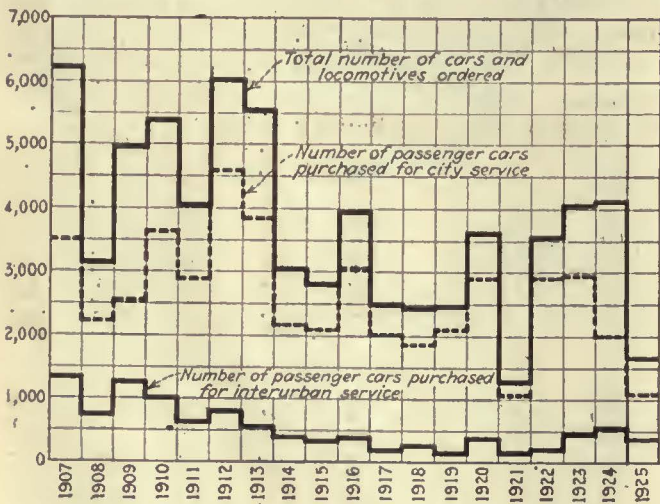
There were but three one-man cars purchased for interurban service.

Purchases of electric locomotives were slightly greater last year than for 1924, there being 47 electric locomotives bought during 1925 as compared with 31 during 1924. The order of the Pennsylvania Railroad for 24 locomotives of 75 tons each constitutes the greatest proportion of those ordered. The remaining 23 locomotives were distributed among twelve other companies.

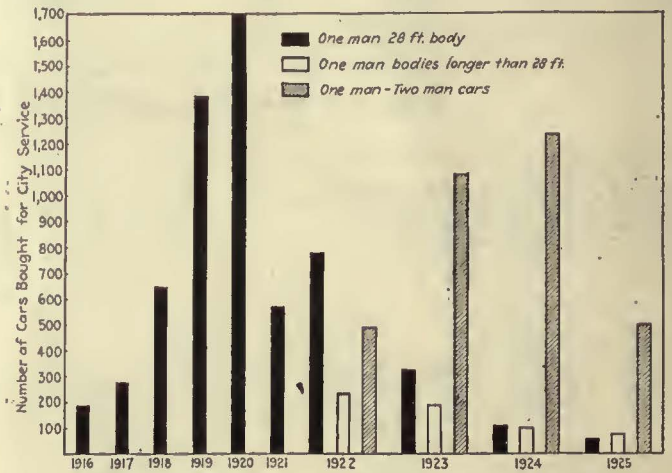


Number of Cars Reported as Junked During Last Four Years

A special comparison of cars ordered during the past ten years is given in Table II. Separate tabulations are



Graphical Analysis of Total Cars and Locomotives and Passenger Cars for City and Interurban Purchased During Past Nineteen Years



Graph Showing Relative Purchases of One-Man and One-Man, Two-Man Cars During the Past Ten Years



Table IV—Details of Rolling Stock Ordered During 1925

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
<b>New England States</b>											
<b>Connecticut</b>											
Connecticut Co.	1	Derrick	City	Motor	Double	40—0	32.70				
New York New Haven & Hartford R.R.	13	Passenger	Interurban	Motor	Double	80—1½	87.75	4	120	Train	
New York New Haven & Hartford R.R.	22	Passenger	Interurban	Trailer	Double	80—1½	52.00		120	Train	
<b>Maine</b>											
Androscoggin Kennebec Ry.	1	Work	City	Motor	Double	24—0	21.5				6 CM
Cumberland County Pwr. & Lt. Co.	1	Work	City	Motor	Double	37—0					3 CM
<b>Massachusetts</b>											
Boston Elevated Ry.	60	Passenger	City	Motor	Double	69—2½	41.00	2	72	Train	
	100	Passenger	City	Motor	Double	45—0	15.50	4	48	Both	
Eastern Mass. St. Ry.											82 CM
East Taunton St. Ry.	2	Passenger	City	Motor	Double	36—10	15.25	4	40	Both	14 SP
Interstate Consolidated St. Ry.	3	Passenger	City	Motor	Single	28—0½	8.05	2	33	One	5 SM
Interstate Consolidated St. Ry.	5	Passenger	City	Motor	Double	40—3		4	44	Both	
Middlesex & Boston St. Ry.											46 CM
Springfield St. Ry.	1	Passenger	City	Motor	Double	41—0	12.00	4	44	Both	
<b>New Hampshire</b>											
Portsmouth El. Ry.											15 CM
<b>Rhode Island</b>											
United Elec. Rys. (Providence)	25	Passenger	City	Motor	Double	41—0	15.50	4	38	Both	
Total cars New England States.....											
	234										
<b>Eastern States</b>											
<b>District of Columbia</b>											
Washington Ry. & Elec. Co.	2	Sweepers	City	Motor	Single	28—4	16.25				
<b>Maryland</b>											
Baltimore & Ohio R.R. Co. (Staten Is. Lines)	90	Passenger	Interurban	Motor	Double	67—3½	47.875	2	71	Train	
Baltimore & Ohio R.R. Co. (Staten Is. Lines)	10	Passenger	Interurban	Trailer	Double	67—3½	41.65		71	Train	
United Rys. & Elec. Co.	22	Passenger	City	Motor	Double	44—10	20.50	2	49	Both	83 CM
United Rys. & Elec. Co.	1	Crane and Plow	City	Motor	Double	44—0	34.00	4			
<b>New York</b>											
Binghamton Ry.	5	Passenger	City	Motor	Double			4	34	Both	
Brooklyn-Manhattan Transit Co.	2	Freight	City	Trailers	Double						472 CM
Brooklyn-Manhattan Transit Co.	2	Crane	City	Trailer	Double	44—0	25.00				
Elmira Water, Lt. & R.R. Co.	2	Passenger	City	Motor	Single	27—9½	18.34	2	32	One	
Interborough Rapid Transit Co.											4 CM
New York & Long Island Tract. Co.	1	Sweeper	City	Motor	Single	28—6	12.00	2			16 CM
Poughkeepsie & Wappinger Falls Ry.	12	Passenger	City	Motor	Double	41—4½	17.25	4	44	One	
Schenectady Ry.	1	Dump	City	Motor	Double	40—0	25.00	4			4 IM
Schenectady Ry.											
Southern New York Ry., Inc.											
<b>Pennsylvania</b>											
Allegheny Valley St. Ry.	1	Sweeper	City	Motor	Single	28—3	13.00				
Altoona & Logan Valley Elec. Ry.	13	Passenger	City	Motor	Double	41—10	18.20	4	44	Both	25 STCM
Conestoga Traction Co.	3	Passenger	City	Motor	Single	30—0	9.00	2	31	One	
Harrisburg Railways											6 CMO
Lackawanna & Wyoming Valley R.R.	4	Passenger	Interurban	Motor	Double	60—6	40.50	2	72	Two	
Lehigh Traction Co.	13	Passenger	City	Motor	Double	48—8	24.50	4	70	Two	8 CM
Pennsylvania R.R.	8	Passenger	Interurban	Motor	Double	54—0	58.30	2	72	Train	
Philadelphia Rapid Transit Co.	100	Passenger	City	Motor	Double	45—6	18.31	2	53	Both	101 CM
Philadelphia Rapid Transit Co.	1	El. Crane	City	Motor	Double	55—0	46.82	4			49 Work
Philadelphia Rys.											3 CM
Philadelphia & West Chester Trac. Co.	12	Passenger	Interurban	Motor	Double	47—10	29.82	4	62	Two	
Pittsburgh Railways	83	Passenger	City	Motor	Double	45—2	18.75	4	52	Both	
Pittsburgh Railways	20	Passenger	Interurban	Motor	Double	45—2	19.75	4	50	Both	
Reading Transit Co.	1	Sweeper	City	Motor	Double						5 CMO
Seranton Ry.	10	Passenger	City	Motor	Double	41—10	18.50	4	44	Both	
Shamokin & Mt. Carmel Transit Co.	3	Passenger	Interurban	Motor	Double	45—0	17.89	4	48	Both	
Stroudsburg Traction Co.											2 CM
Webster, Monessen, Belle Vernon & Fayette City St. Ry.	3	Passenger	City	Motor	Double	41—2	17.50	4	46	Both	
West Side Elec. St. Ry.	3	Passenger	City	Motor	Double	41—2	17.50	4	46	Both	
<b>Virginia</b>											
Virginia Ry. & Pwr.	15	Passenger	City	Motor	Double	40—1			40	Both	
Total cars Eastern States.....											
	443										
<b>Central States</b>											
<b>Illinois</b>											
Chicago North Shore & Milwaukee R.R.	3	Freight	Interurban	Motor	Double	36—0					4 CM
	20	Passenger	Interurban	Motor	Double	55—3½	51.00	4	54	Train	
	4	Diner	Interurban	Trailer	Double	55—3½	51.50		24	Train	
	5	Freight	Interurban	Trailer	Double	50—0	34.00			Train	
Chicago Rapid Transit Co.	1	Passenger	City	Motor	Double					Train	
East St. Louis & Suburban Ry.	1	Dump	City	Trailer	Double	40—0	16.00				
Illinois Pwr. & Lt. Corp. (Galesburg)											14 CM
Illinois Traction Inc.	100	Freight	Interurban	Trailer	Double	36—0				Train	
Kewanee & Galva Ry.	1	Passenger	Interurban	Motor	Double	40—3	13.00	4	50	One	
<b>Indiana</b>											
Burch Grove Traction Corp.	15	Passenger	Interurban	Motor	Double	60—0			56	Train	2 IM
	10	Passenger									
Chicago South Shore & South Bend Ry.	2	Baggage	Interurban	Motor	Double	60—0			44	Train	
	2	Parlor	Interurban	Trailer	Double	64—0			37	Train	
	2	Diner	Interurban	Trailer	Double	64—0			24	Train	
Evansville & Ohio Valley Ry.	6	Passenger	Interurban	Motor	Double	44—4	17.00	4	48	Both	
Gary Street Ry.	5	Passenger	City	Motor	Single	30—0	6.00	2	32	One	
Gary & Hobart Trac. Co.	3	Passenger	Interurban	Motor	Double	44—8½	21.26	4	44	Both	
	5	Passenger	Interurban	Motor	Double	61—6	46.00	4	50	Two	
Indiana Service Corp.	6	Dump	Interurban	Trailer	Double	40—0	17.00				
	2	Passenger	Interurban	Motor	Double	61—6	42.50	2	50	Train	
Interstate Public Service Co.	1	Parlor & Dining	Interurban	Motor	Double	59—0	46.50	2	24	Two	
Interstate Public Service Co.	6	Work	Interurban	Trailer	Double	40—0	18.30				
Northern Indiana Pwr. Co.	2	Freight	Interurban	Trailer	Double	25—0					
Union Traction Co. of Indiana	15	Passenger	Interurban	Motor	Double	65—5	45.00	4	60	Two	
<b>Iowa</b>											
Iowa Southern Utilities Corp. (Burlington)	1	Sweeper	City	Motor							



Table IV—Details of Rolling Stock Ordered During 1925—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
<b>Kentucky</b>											
Kentucky Traction & Terminal Co.	2	Passenger	City	Motor	Single	26—6	9.00	2	24	One	2 CM
<b>Michigan</b>											
Dept. Street Railways (Detroit)	6	Dump	City	Trailer	Double	40—0	17.00				
Dept. Street Railways (Detroit)	2	Dump	City	Motor	Double	40—0	25.00	4			10 CM 30 CM 2 SM
Detroit United Ry.											
Grand Rapids Ry.	27	Passenger	City	Motor	Double	37—1		4	43	Both	
Lake Superior District Power Co.	1	Passenger	Interurban	Motor	Double	40—6	13.00	4	44	One	4 CM
Menominee & Marinette Lt. & Trac. Co.											
<b>Minnesota</b>											
Twin City Rapid Transit Co.	5	Passenger	City	Motor	Double	35—10	12.10	4	43	One	
	1	Passenger	City	Motor	Double	46—8	12.25	4	57	Two	
	1	Passenger	City	Motor	Double	46—8	13.40	4	50	Two	
<b>Missouri</b>											
Missouri & Kansas Ry.	2	Passenger	Interurban	Motor	Double	45—0	20.00	4	54	Both	
Missouri & Kansas Ry.	1	Passenger	Interurban	Motor	Double	47—0	21.00	4	54	Both	32 CM
United Rys. Co. of St. Louis											
<b>Ohio</b>											
Cincinnati St. Ry. (Traction Co.)	1	Dump	City	Trailer	Double	42—0	34.00	4			
Cincinnati Trac. Co.	1	Crane	City	Motor	Double	44—0	34.00	4			
Cincinnati Trac. Co.	1	Dump	City	Trailer	Double	40—0	16.00				
	95	Passenger	City	Motor	Double	51—2	20.80	4	55	Two	
	4	Crane	City	Motor	Double	44—0	34.00	4			
	4	Dump	City	Motor	Double	40—0	25.00	4			
Cleveland Railways	2	Dump	City	Trailer	Double	40—0	16.00				
	2	Rail cars	City	Trailer	Double	64—0					
	3	Sweepers	City	Motor	Double						
Cleveland So. Western Ry. & Lt. Co.											8 CM
Columbus, Delaware & Marion Elec. Co.	2	Parlor	Interurban	Motor	Double	63—4	56.75			Two	
Columbus Ry. Pwr. & Lt. Co.	23	Passenger	City	Motor	Double	45—3	18.31	4	48	Two	
Dayton, Springfield & Xenia Southern Ry.	1	Passenger	Interurban	Motor	Double	42—9	13.00	4	52	Both	
Lima Toledo R.R. Co.	10	Freight	Interurban	Trailer	Double	49—5	20.00				
Northern Ohio Trac. & Lt. Co.	25	Freight	Interurban	Trailer	Double	49—8					
Northern Ohio Trac. & Lt. Co.	6	Freight	Interurban	Trailers	Double	42—6					
Ohio River Elec. Ry. Co.	7	Passenger	City	Motor	Single	26—6	9.00	2	24	One	
Pennsylvania-Ohio Elec. Co.	13	Passenger	City	Motor	Double	43—0	16.00	4	44	Both	14 CM 18 IM 1 IT
Stark Elec. Co.	1	Dump	Interurban	Trailer	Double	40—0	16.00				
Toledo, Bowling Green & Southern Trac. Co.	1	Freight	Interurban	Motor	Double	51—0	39.50				
Youngstown Municipal Ry.	13	Passenger	City	Motor	Double	43—0	16.00	4	44	Both	
Youngstown & Suburban Ry.	4	Passenger	Interurban	Motor	Double	41—10	17.80	4	44	Both	
<b>Wisconsin</b>											
Lake Superior Dist. Pwr. Co.	1	Passenger	Interurban	Motor	Double	40—3	17.25	4	50	Both	
Madison Railways	12	Passenger	City	Motor	Single	28—10	9.00	2	32	One	
Milwaukee Elec. Ry. Lt. Co.	2	Passenger	City	Trailer	Double	53—5	18.10				16 CM 2 Salt 1 Work 1 IM
Wisconsin Pwr. & Lt. Co.											
Total cars Central States	597										
<b>Southern States</b>											
<b>Alabama</b>											
Alabama Pwr. Co.	2	Passenger	City	Motor	Single	32—0	7.50	2	32	One	
Mobile Light & R.R. Co.	2	Flat	City	Motor	Double	36—0	6.00				3 CM
Mobile Light & R.R. Co.	2	Work	City	Motor	Single	24—0	4.00				
<b>Arkansas</b>											
Pine Bluff Co.	2	Passenger	City	Motor	Single	28—0	8.00	2	32	One	
<b>Florida</b>											
Coral Gables Utility Corp.	2	Passenger	Interurban	Motor	Double	40—1		4	44	Both	
	1	Passenger	Interurban	Motor	Double	47—8	18.82	4	52	Both	
	3	Passenger	City	Motor	Double	28—0	8.61	2	33	One	
	9	Passenger	Interurban	Motor	Double			4		Both	
Miami Trac. Co.	15	Passenger	City	Motor	Double	28—0	8.61	2	33	One	
Municipal Railway of South Jacksonville	4	Passenger	City	Motor	Single	28—0				One	
Tampa Elec. Co.	7	Passenger	City	Motor	Double	45—7	16.00	4	52	Both	
<b>Georgia</b>											
Atlanta Northern Ry.	5	Passenger	Interurban	Motor	Double	46—5	18.00	4	51	Both	
Columbus Elec. & Pwr. Co.											16 CM
Georgia Ry. & Pwr. Co.	20	Passenger	City	Motor	Double	46—2	18.22	4	48	Two	60 CM
Georgia Ry. & Pwr. Co.	40	Passenger	City	Motor	Double	46—4	18.64	4	50	Both	
Savannah Elec. & Pwr. Co.											4 CM
<b>North Carolina</b>											
Ashville Pwr. & Light Co.	12	Passenger	City	Motor	Single	28—0	8.34	2	33	One	
Ashville Pwr. & Light Co.	4	Passenger	City	Motor	Single	33—0	11.10	2	40	One	3 CM
Tide Water Power Co.											
<b>Tennessee</b>											
Knoxville Pwr. & Lt. Co.	16	Passenger	City	Motor	Single	29—6	8.50	2	29	One	
	1	Passenger	Interurban	Motor	Double	43—1	15.00	4	42	Two	
Union Trac. Co.	1	Freight	Interurban	Motor	Double	43—1	15.00				
	1	Work	Interurban	Trailer							
Total cars Southern States	149										
<b>Western States</b>											
<b>California</b>											
Key System Transit Co.	41	Passenger	City	Motor	Double	45—6	20.50	4	48	Two	10 CM
	1	Passenger	City	Motor	Double	48—0	24.00	4	52	Two	
	1	Work	City	Trailer	Double	20—4					
Market Street Ry.	24	Passenger	City	Motor	Double	47—0	19.50	4	50	Two	10 CM 14 CM 6 CS 33 IF
Pacific Electric Ry.											
San Diego El. Ry.	6	Work	City	Trailer	Double	40—0	23.00				
<b>Kansas</b>											
Topeka Ry.											10 CM
<b>Oklahoma</b>											
Northeast Oklahoma R.R.											2 CM
Oklahoma Ry.	10	Passenger	City	Motor	Single	30—0	8.00	2	32	One	



Table IV—Details of Rolling Stock Ordered During 1925—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Wt. Light Tons	No. Motors	Seating Capacity	One or Two Man	No. Cars Junked During Year
<b>Oregon</b>											
Portland Electric Pwr. Co.											4 CM
<b>Texas</b>											
El Paso Elec. Ry. Co.	1	Passenger	Interurban	Motor	Double	30— 0	10.50	2	32	One	5 CM
Southeastern Traction Co.											
Total cars Western States	84										
<b>Cuba</b>											
Havana Central R.R.	8	Passenger	Interurban	Motor	Double	51— 9	25.10	4	60	Two	
<b>Philippine Islands</b>											
Manila Electric Co.	20	Passenger	City	Motor	Double	41— 5	14.00	2	60	Two	
Total cars Extraterritorial	28										
<b>Dominion of Canada</b>											
<b>British Columbia</b>											
British Columbia El. Ry.	6	Passenger	City	Motor	Double	48— 8	23.15	4	48	Two	1 CL
	6	Passenger	City	Trailer	Double	48— 8	22.90		55	Train	1 CS
	1	Flat	Interurban	Trailer	Double	37— 0	15.50				
	1	Work	City	Motor	Single	10— 0	8.00	2			
<b>New Brunawick</b>											
New Brunswick Pwr. Co.	2	Passenger	City	Motor	Single	31— 0	12.00	2	30	One	
<b>Ontario</b>											
Cornwall Street Ry.	1	Passenger	City	Motor	Double	30— 0	12.00	2	30	One	
Hydro-Electric Pwr. Comm.	3	Passenger	City	Motor	Double	45— 4	22.00	4	44	Both	
Hydro-Electric Pwr. Comm.	1	Passenger	Interurban	Motor	Double	50— 0	27.00	4	54	Two	
Niagara, St. Catharines & Toronto Ry.	12	Passenger	City	Motor	Double	46— 6	14.90	4	44	Both	
Oshawa Ry.	1	Work	City	Motor							
Ottawa Electric Ry.	10	Passenger	City	Motor	Double	45— 0	19.50	4	54	Both	
Ottawa Electric Ry.	2	Sweeper	City	Motor	Single	24—10		2			
Public Utilities Comm. of Kitchener	1	Sweeper	City	Motor	Single	22— 0					
<b>Quebec</b>											
Canadian National Rys.	12	Passenger	Interurban	Motor	Double	42— 6	15.00	4	44	Both	
	3	Sweeper	City	Motor	Single	24—10	16.00	2			
	1	Plow	City	Motor	Single	26— 0	19.00	2			
Montreal Tramways	1	Dump	City	Motor	Double	40— 0	25.15	4			
	2	Rail	City	Motor	Double	42— 0	24.50	4			
	4	Flat	City	Motor	Double	34— 0	20.75				48 CM
New Foundland Lt. & Pwr. Co.	7	Passenger	City	Motor	Single	28— 0½	11.00	2	30	One	
Total cars Canada	77										

Abbreviations used for cars junked.

CM—city motor cars.

CMO—open city motor cars.

CS—city service cars.

CL—city line cars.

STCM—single truck city motor cars.

SP—snow plows.

SM—service motor cars.

IM—interurban motor cars.

IT—interurban trailers.

IF—interurban freight cars.

given for cars in city service and those in interurban service. Referring to this table, it is interesting to note how the number of safety cars purchased increased each year from 1916 up to and including 1920, and during the same period how the number of large two-man cars gradually decreased. A comparison by percentage that the number of cars purchased bears to the total shows that the highest percentage for safety cars was reached in 1919. One-man, two-man cars increased each year from 1922 to 1924, but the number purchased during 1925 has fallen off to less than one-half those purchased during 1924.

Details of rolling stock ordered by individual companies are given in Table IV. The railways in each state are grouped and the various states are arranged into groups which follow the same arrangement as that used by the United States Census Bureau. This arrangement is the same as that used for the 1924 statistics. Companies in Canada, Cuba and the Philippine Islands are listed separately. In addition to listing the number of cars ordered by the various companies, this table classifies the cars as to type of service and gives information as to length, seating capacity, weight, number of motors and general characteristics, such as motor or trailer and single or double truck.

The recapitulation by districts shows that very few cars were bought by companies in the Western states, there being but five companies that reported a total of 83 city cars purchased and one company that reported new interurban cars. During 1924 this district showed the greatest number of cars purchased. Eighteen companies reported a total of 1,663 cars and locomotives

bought for city and interurban service. Omitting express, freight, service and miscellaneous cars, there were 76 passenger cars purchased for city service during 1925, as against 271 passenger cars for city service during 1924. Only one interurban car was reported for 1925 as against 27 purchased during 1924. Comparison of other districts shows that the New England district purchased 234 cars during 1925 as against 92 in 1924; the Eastern states, 443 during 1925 as compared with 1,206 in 1924; the Central states, 597 in 1925 as against 849 in 1924; and the Southern states, 149 in 1925 as compared with 158 in 1924. Canada reported 77 cars for 1925 as against 98 for 1924.

For convenience in comparing detailed figures, and in order to show at a glance the relative amount of rolling stock purchased by the various railways year by year, Table I has been prepared. This gives the total number of cars ordered each year since 1907. Cars purchased are divided into four classes: Passenger cars, both city and interurban; freight, express and miscellaneous cars; and electric locomotives. The miscellaneous cars include service cars, snow plows, sweepers, work cars, etc. Three graphs have been prepared to show graphically the number of cars ordered each year since 1916. One of these gives the total number of cars and locomotives; the second one gives purchases of passenger cars for city service and the third interurban cars bought for passenger service. The number of passenger cars bought for city service annually has been decreasing since 1923. The number purchased in 1925 is approximately the same as for 1921, which is the lowest year recorded. Purchases of interurban cars



increased from 1921 to 1924, but 1925 shows a drop of about six-tenths of the number purchased in 1924.

A study of the various one-man two-man cars ordered during 1925 for city service shows that they run quite uniform in length, weight and seating capacity. Lengths vary from 36 ft. 10 in. to 47 ft. 7 in., weights from 14.9 tons to 20.5 tons, and seating capacity from 34 to 54. The weighted average for all cars of this class purchased during 1925 gives a length of 44 ft. 1 in., a weight of 18.07 tons and a seating capacity of 48. It is interesting to compare these dimensions with similar ones made from a study of the one-man two-man cars ordered in 1923. The weighted average for the cars was 45 ft. 1 in. long with a seating capacity of 54. It thus appears that the tendency during 1925 is to use a car slightly smaller in size than those of 1923. In general design, the cars have remained about the same for the last three years. Wheels of 26-in. diameter are most commonly used and platforms are either level with the car floor or with a slight ramp, a single intermediate step being used between the roadway and the car platform. Arch type roof construction is used in most cases.

The number of cars junked during 1925 is less than for 1923 and 1924, but is slightly greater than for 1922, there being a total of 1,340 cars reported as scrapped during 1925. The majority of these are motor cars in city service. The largest number of cars reported as junked by individual railways was 472 by the Brooklyn-Manhattan Transit Corporation and 101 by the Philadelphia Rapid Transit Company, 83 by the United Railways & Electric Company of Baltimore, and 82 by the Eastern Massachusetts Street Railway. An accompanying diagram shows graphically the number of cars junked during the past four years.

The accompanying tables and graphical charts of rolling stock were prepared from information obtained from replies to questionnaires sent to all the electric railways in the United States and Canada. This was supplemented by information which had been previously obtained and published in ELECTRIC RAILWAY JOURNAL, and from lists of cars furnished by the principal car manufacturers. It is quite impossible to receive replies from all railways when a definite time for publication must be met, but this year's information has been particularly complete and the lists received from manufacturers has enabled a careful check to be made of the

Table V—Electric Locomotives Ordered During 1925

Name of Railway	Number	Weight, Tons	Length Over All Ft. In.
<b>New England States</b>			
Aroostook Valley R.R.	1	50	...
New York, New Haven & Hartford R.R.	3	80	37-6
<b>Eastern States</b>			
Delaware, Lackawanna & Western R.R.	1	50	29-0
New York Rapid Transit Corp.	1	50	37-4
Pennsylvania R.R.	24	75	.....
<b>Central States</b>			
Chicago, South Shore & South Bend Ry.	4	80	.....
Great Northern R.R.	4	177	.....
Michigan Central R.R.	2	120	42-2
St. Louis and Belleville El. Ry.	1	80	40-0
<b>Western States</b>			
San Diego Electric Ry.	1	50	40-0
<b>Cuba</b>			
Hershey Cuban Ry.	3	60	37-4
<b>Canada</b>			
Montreal & Southern Counties Ry.	1	50	.....
Oshawa Ry.	1	50	32-0
<b>Total</b>	<b>47</b>		

Table VI—Recapitulation by Districts of Cars Ordered During 1925

	New England States	Eastern States	Central States	Southern States	Western States	Extra territorial	Total for United States	Total for Canada	Grand Total
Number of companies reporting new cars	7	21	36	12	5	2	83	11	94
<b>City Service</b>									
One-man cars, 28-ft. body	3	...	9	36	..	..	48	7	55
One-man cars with bodies longer than 28-ft.	...	5	17	22	10	..	54	2	56
Single truck	...	12	5	..	..	..	17	1	18
Double truck	133	254	53	47	..	..	487	25	512
One-man, two-man cars	...	13	120	20	66	20	239	6	245
Two-man cars (surface)	...	...	100	..	..	..	160	..	160
Motor cars for rapid transit lines	60	...	2	..	..	..	2	6	8
Trailers	3	12	28	4	7	..	54	16	70
Service and miscellaneous cars	199	296	334	129	83	20	1,061	63	1,124
<b>Total cars, city service</b>									
<b>Interurban Service</b>									
One-man, double-truck cars	...	...	2	..	1	..	3	..	3
One-man, two-man cars	...	23	18	17	..	..	58	12	70
Two-man cars	...	16	23	1	..	8	48	1	49
Trailers	22	10	8	..	..	..	40	..	40
Motor cars for train service	13	98	47	..	..	..	158	..	158
Express and freight cars	...	...	152	1	..	..	153	1	154
Miscellaneous cars	...	...	13	1	..	..	14	..	14
<b>Total cars interurban service</b>	<b>35</b>	<b>147</b>	<b>263</b>	<b>20</b>	<b>1</b>	<b>8</b>	<b>474</b>	<b>14</b>	<b>488</b>
Electric locomotives	4	26	11	...	1	3	45	2	47
<b>Total cars and electric locomotives</b>	<b>238</b>	<b>469</b>	<b>608</b>	<b>149</b>	<b>85</b>	<b>31</b>	<b>1,580</b>	<b>79</b>	<b>1,659</b>

figures obtained from the various railways. In some cases where replies were not received from the operating companies, the information furnished by the car manufacturers has been used in the tables.

### 900 Men Rush Rehabilitation Work on South Shore Road

MANY of the tasks in the rehabilitation work begun when the Chicago, South Shore & South Bend Railroad came under the control of Samuel Insull and associates had been completed on Dec. 1. Work in other phases of this program will continue as long as weather permits. More than 900 men were still engaged in this work on Dec. 1.

Some of the work which has been completed follows:

Ten miles of 70 and 80 lb. rail between Kensington and Hammond replaced with 100-lb. rail.

Entire track from South Bend to Kensington resurfaced with more than 300 cars of cinder ballast.

New angle bars installed at all track joints, approximately 11,000 pairs being used.

All block and other signals rebuilt, including wiring and controls.

New telephone lines for company communication installed.

Entire right-of-way cleared of undergrowth and weeds.

Portions of the rehabilitation work now under way are:

Rock ballasting of the section from Kensington to Hammond 60 per cent completed.

Steel trusses to support trolley wire on the above section in place. These trusses are mounted on the wooden poles.

Side tracks being extended and double-ended to take care of increase in freight business.

Freight stations enlarged and renewed.

Four new electric substations now under way and work is to start soon on a fifth.

New stations at Michigan City and South Bend in use and Gary and Tremont passenger stations being rebuilt.

Twenty-eight more passenger trains are being operated by the South Shore Line than at this time a year ago. Two of these are limited trains. The others are distributed between local and express service.



# 34 per Cent of Passenger Cars Are Over Twenty Years Old

Less than Half of All Cars Now in Electric Railway Service Were Purchased in the Last Fifteen Years—Greater Number of New Cars Are Needed to Modernize Industry than Was Anticipated—Nationwide Survey More than Confirms Previous Estimates

**P**URCHASE of more than 28,000 electric railway passenger cars is necessary in the near future if the industry is to be brought up to the high degree of efficiency necessary under present-day conditions. This is based only on replacement of those cars which are today twenty years of age or older. Many cars built in more recent periods may rightfully be considered obsolete equipment, so that an even greater number of new cars is needed to modernize fully electric railway rolling stock. This estimate would provide for replacement of obsolete cars only. It makes no provision for expansion of service which is known to be necessary in many localities if the patrons are to be given satisfactory accommodations.

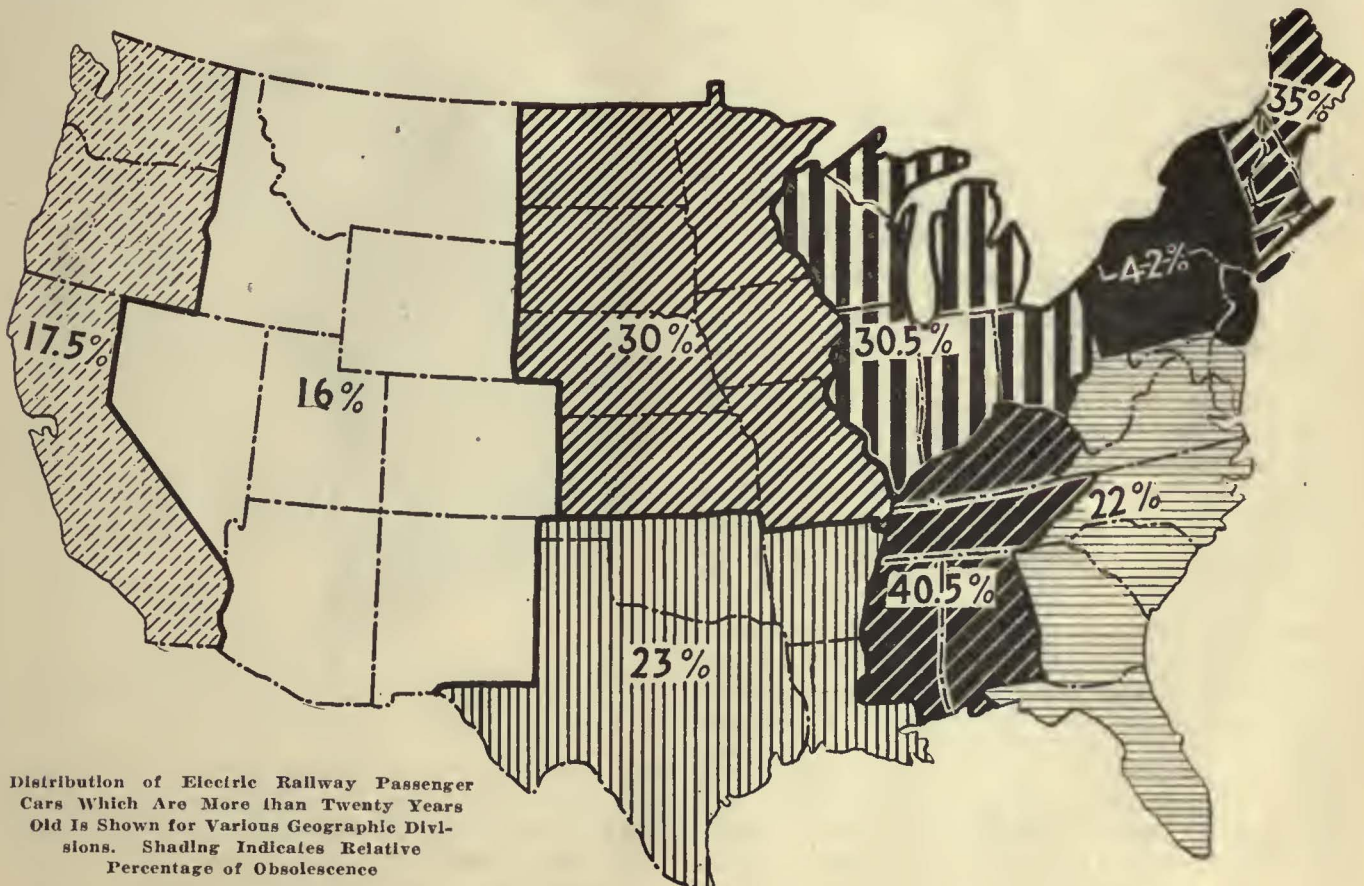
Purchase of such a large quantity of equipment

Age, Years	Number of Cars	Per Cent of Total
More than 25 .....	11,740	14.2
20 to 25 .....	16,345	19.8
15 to 20 .....	16,945	20.5
10 to 15 .....	13,740	16.8
5 to 10 .....	12,440	15.1
Less than 5.....	11,240	13.6
	82,450	100.0

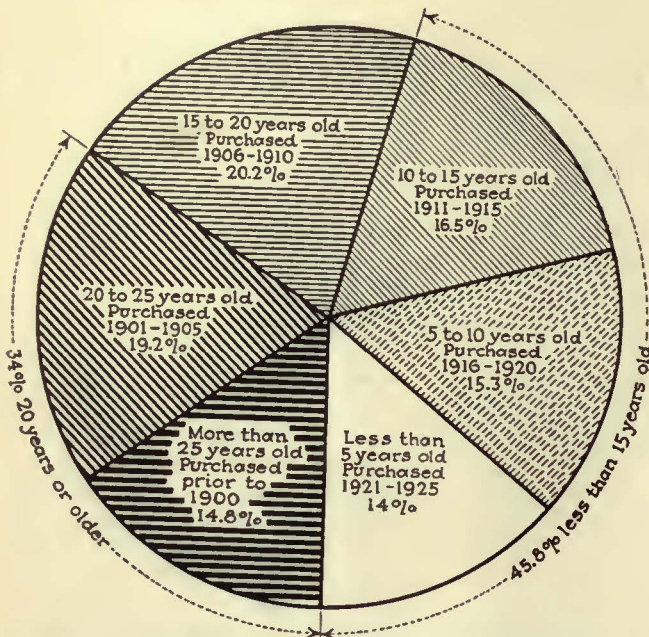
involves the expenditure of a very large amount of money. If the average cost of a car is \$10,000, which is undoubtedly low today, it means that \$280,000,000 will be required. While such a task appears herculean, it is vital if the industry is to keep pace. For if the program of replacement is put off, the problem of providing

new equipment of a character to attract patronage and win good will becomes cumulatively more difficult.

These statements are based on a survey made by this paper in the past few weeks, in which information has been obtained covering the industry in the entire United States. The results have more than confirmed previous estimates made by ELECTRIC RAILWAY JOURNAL, the American Electric Railway Association and others in position to analyze available statistics. The







Inventory of City Cars Shows 34 per Cent That Are Twenty Years or More Old. In Addition 20.2 per Cent Have Seen Fifteen to Twenty Years of Service

more complete information on which the new figures are based shows the problem to be even more serious than had been anticipated in the earlier studies. In these estimates two general methods of approach have been used. One had for its object a determination of the deficiency in annual replacements, assuming a twenty-year life as a basis. The other was worked out by subtracting the purchases of new equipment each year since 1907 from the total number of cars owned. In this latter estimate the object was to find the number of passenger cars which were purchased previous to the development of many of the improvements which are now included in modern cars. These estimates, based upon figures compiled by the United States Census Bureau and statistics published annually in *ELECTRIC RAILWAY JOURNAL*, have indicated that there are 25,000 obsolete electric railway cars in service. An article covering this subject was published in *ELECTRIC RAILWAY JOURNAL* for Nov. 14, 1925, page 853.

SURVEY COVERED ENTIRE COUNTRY

The more comprehensive analysis of the age of the equipment in various sections of the country has been obtained from a nation-wide survey published here for the first time. Questionnaires were sent to every electric railway property in the United States. The returns were supplemented by records compiled by the General Electric Company and the Westinghouse Electric & Manufacturing Company through personal contact of representatives of their division offices with the electric railway properties in various sections of the country.

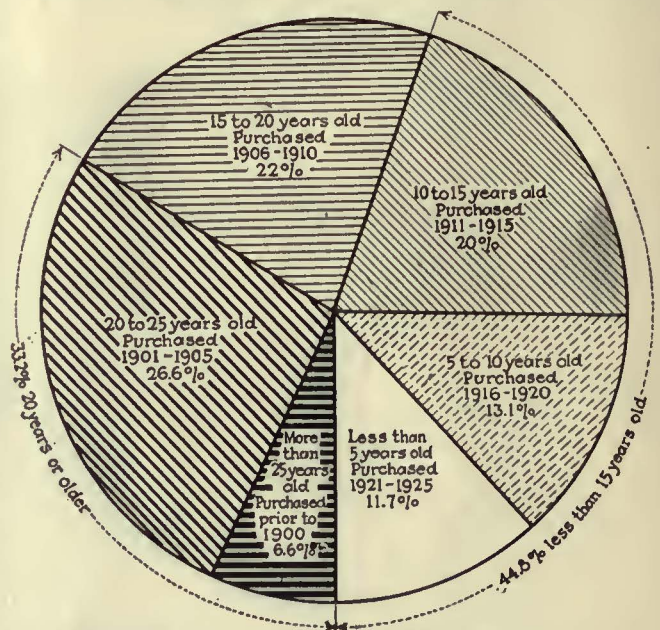
The importance of directing attention to the replacement of obsolete equipment is strikingly brought out. Information obtained shows that 34 per cent of the total number of passenger cars are more than twenty years old. There are at present 82,450 passenger cars in the United States. This figure was compiled by *ELECTRIC RAILWAY JOURNAL* a year ago and published in the issue of March 7, 1925, page 368. Similar figures are collected annually for the McGraw Electric Railway Directory. Applying the above proportion of 34 per

cent indicates that over 28,000 cars are more than twenty years old. Most of the major developments that are included in modern car design and construction have been made considerably inside of a twenty-year period. Consequently the number of cars which do not incorporate these developments is considerably above the figure given.

Further analysis of the age of cars by geographical districts and by class of service is shown in the table and on the accompanying map. It indicates the relative conditions in various parts of the country. In the Middle Atlantic States, comprising New York, New Jersey and Pennsylvania, it is seen that 42 per cent of the existing equipment is over twenty years old. In the East South Central States, comprising Kentucky, Tennessee, Alabama and Mississippi, 40.5 per cent of the equipment is shown to be more than twenty years old. The proportion ranges down through the remainder of the nine divisions into which the country is divided to 16 per cent for the Mountain States of Idaho, Colorado, Utah, Wyoming, New Mexico, Arizona, Nevada and Montana. It is of interest in passing to note that the sections which show the largest proportion of equipment over twenty years old correspond to those in which construction of electric railway lines progressed rapidly during the earlier years of the industry's history.

The per cents indicating total number of obsolete cars follow the condition of city rather than interurban equipment. This is primarily due to the greater number of city cars owned. In the table on page 27 are shown the per cents for both classes of service, divided between the various geographic sections. Here, it will be noted, the distribution of obsolete interurban cars varies considerably from the city distribution.

Returns from this survey have been compiled to show the relative age of passenger cars in five-year periods



Condition of Interurban Equipment Is Illustrated by This Diagram. the Largest Group of Cars Is from Twenty to Twenty-five Years Old

since 1900 and those purchased previous to that year. These have been further subdivided as between city and interurban cars. The results are shown graphically in the accompanying circle diagrams.

Under the city classification 14.8 per cent were pur-

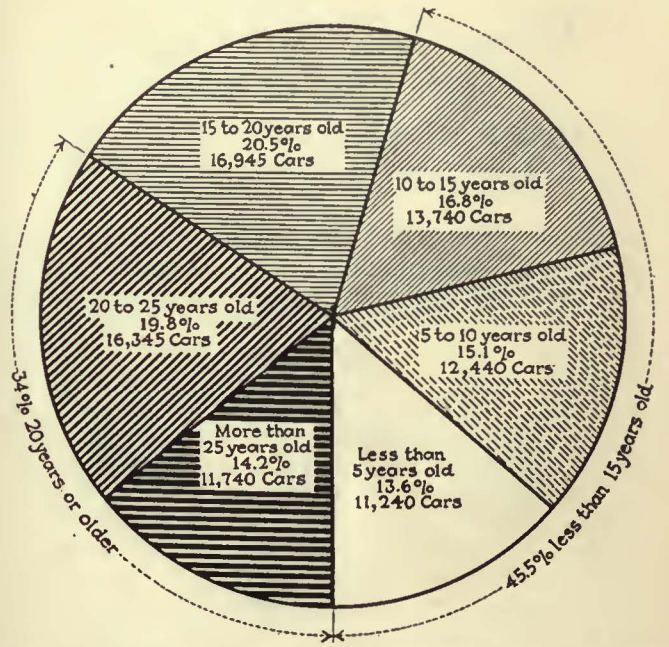


chased prior to 1900. Thus they were found to be more than 25 years old; 19.2 per cent fall in the group having an age of between twenty and 25 years. This makes a total of 34 per cent that have been in service for twenty years or longer. There is a group comprising 20.2 per cent which are from fifteen to twenty years old. These would also probably fall into an obsolete classification on the basis of the developments which have been made in car construction since they were built.

Of the cars which may be classed as more nearly modern, 16.5 per cent are from ten to fifteen years old, 15.3 per cent are five to ten years old and 14 per cent are less than five years old. This makes a total of 45.8 per cent of the total number of city cars that have been purchased within fifteen years.

A similar division has been made of the interurban cars—6.6 per cent were purchased previous to 1900 and are more than 25 years old; 26.6 per cent are twenty to 25 years old; 22 per cent fall into the group from fifteen to twenty years. Of the cars that are less than fifteen years old 20 per cent are between ten and fifteen years, 13.1 per cent fall between five and ten years and 11.7 per cent were purchased within the last five years.

An interesting check is obtained on the estimates made in preparing the chart on page 854 of the Nov. 14 issue, in which the conclusion that there are 25,000 obsolete cars was derived. In compiling the earlier chart the assumption was made that all cars purchased since 1907 are still in service. It was pointed out at that time that a certain number of comparatively modern cars had been destroyed by fire, accident and other causes. No method of approximating this number was available at that time. The present survey gives a basis for comparison with the original estimate. The diagram for city and interurban cars combined shows that 45.5 per cent of the total number of cars have been purchased within the last fifteen years. This is equivalent to approximately 37,500 cars on the basis of last year's estimate of 82,450 cars. The total number of cars purchased during these last fifteen years, as shown in the tabulation in another article in this issue for cars purchased each year since 1907, amounts



Combined Interurban and City Cars Are Here Divided in Five-Year Periods. Cars Purchased Previous to 1900 Are Grouped Together. 34 Per Cent of the Total Are at Least Twenty Years Old

to approximately 42,700. The difference of 5,200 cars represents those destroyed by fire, accident and other causes and those abandoned and not reported for various reasons.

Consideration of the combined diagram for both city and interurban cars gives a graphical presentation of the general condition of equipment. From this chart there are 14.2 per cent of the total number of passenger cars that are more than 25 years old. This amounts to 11,740 cars; 19.8 per cent fall in the group ranging from twenty to 25 years and aggregate 16,345 cars. Thus, the total of the combined city and interurban cars more than twenty years old amounts to 28,085. In addition there are 16,945 cars that are fifteen to twenty years old and amount to 20.5 per cent of the total. Unquestionably, most of the cars in this last group do not include modern developments in construction and design. Weight reduction, low floors, small wheels, higher grade materials and many other improvements have been introduced within comparatively recent years. Many developments have also been made in trucks, motors and control, air brakes, door controls and other items of equipment.

This analysis has been presented in considerable detail because of the importance of the subject from the standpoint of the future progress of the industry. It has been repeatedly pointed out that electric railway transportation has survived through a period of serious economic and operating handicaps. The condition of electric railway equipment today is in large measure attributable to the long series of events that have produced rising costs on the one hand and limited income on the other. But the industry today more clearly than ever before occupies a sound economic position as a fundamental necessity in modern community development. There has been a growing conviction that it is on the threshold of an era of renewed prosperity and usefulness. Attention to the subject of replacing obsolete equipment is shown by this analysis to be of paramount importance at this time.

**Passenger Cars Over Twenty Years Old by Geographical Districts**

Geographical District	Per Cent of Passenger Cars Over 20 Years Old		
	City	Interurban	Total
<b>New England</b> (Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut)	29.1	62.6	35
<b>Middle Atlantic</b> (New York, New Jersey, Pennsylvania)	42.6	36.1	42
<b>East North Central</b> (Ohio, Indiana, Illinois, Michigan, Wisconsin)	30.4	30	30.4
<b>West North Central</b> (Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas)	23.2	46.8	30
<b>South Atlantic</b> (Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida)	20.6	42	22
<b>East South Central</b> (Kentucky, Tennessee, Alabama, Mississippi)	40.8	34.5	40.5
<b>West South Central</b> (Arkansas, Louisiana, Oklahoma, Texas)	26.1	7.1	23
<b>Mountain</b> (Idaho, Colorado, Utah, Wyoming, New Mexico, Arizona, Nevada, Montana)	17.1	3.8	16
<b>Pacific</b> (Washington, Oregon, California)	17.1	23	17.5



## Heavy Traction Progress in 1925

Many Projects Completed, both in This Country and Abroad—Increasing Attention Being Paid to Electric Operation on Trunk Lines

MORE progress in steam railroad electrification was made in 1925 than for any year since 1919. In fact, the track equipped for electric operation was 20 miles more than the entire electrifications in 1920 to 1925, inclusive. The work was done by five roads. The Virginian Railway easily stands at the head of the list. There the loads to be hauled are of the heaviest character. The entire installation has been done in a manner not only to replace the steam service, but to increase the capacity largely. That the result has been accomplished is shown in the article published in this paper on Oct. 3, following inauguration of the system between Mullins and Clarks Gap, W. Va. At that time completion of the system to Roanoke had been deferred, since a question had arisen regarding ownership and operation of the property. Since then the objections have been cleared away and it is considered probable that the project will be completed with the present year.

### SEVERAL EXISTING SYSTEMS EXTENDED

The Norfolk & Western Railway also added materially to its electrified mileage during the year. The initial electrification of this road was completed some ten years ago. Since then the electrified mileage has been added to year by year, thus increasing the utility of the electrification. Both this road and the Virginian use the same electrical system, 11,000 volts, 25 cycles, single phase. As they operate in the same territory, carry the same class of freight and are financially connected the interchangeability of equipment is certain to be of great advantage.

Of an entirely different character is the electrification of the Staten Island Rapid Transit system. This road, which is a subsidiary of the Baltimore & Ohio Railroad, handles an extensive passenger business, largely to and from the ferries to Brooklyn and Manhattan. The installation has been planned so that in case the city of New York connects Staten Island with Brooklyn by means of a tunnel, the trains can be operated over the Brooklyn-Manhattan Transit Corporation's subway system. Accordingly the 600-volt direct-current system is used. Electrification of the Staten Island line already has made a marked improvement in transportation in the Borough of Richmond. Train speeds have been increased and more service is being operated than was feasible with locomotive-hauled steam trains.

The Long Island Railroad's 600-volt direct-current system was extended to Babylon during the year, a distance of 27 miles. This converts a large portion of the Montauk Division to electric operation. It has made possible the operation of through trains to New York, eliminating the transfer at Jamaica.

The New Haven Railroad inaugurated electric operation on the Danbury branch, a 25-mile line connecting South Norwalk on the main line with Danbury. The purpose of the electrification was largely to eliminate the facilities for handling steam locomotives at the ends of the line. Practically all operation on the New Haven system west of New Haven, both freight and passenger,

is now handled by electric locomotives and electric motor cars. The 11,000-volt, single-phase system which is used on the main line has been adopted.

Progress has been made on the Illinois Central electrification in Chicago, although it will not be in service for some months.

### FOREIGN ELECTRIFICATIONS PROGRESSING

Many electrification plans are being pushed in Europe. The Austrian government has appropriated some \$18,000,000 for electrifying the Tyrolean Railroad between Salzburg and Brudenz. In Germany work is nearing completion on the Munich-Garmisch line. Financial credits have been secured for the conversion of the Munich-Rosenheim-Kufstein line. A number of other projects are planned for this year.

Progress in Switzerland has been rapid since it was decided about a year ago to accelerate the electrification program so that practically all the main lines of the Swiss Federal Railways will be electrified within the next two years.

The Midi Railway in southern France is carrying to completion an extensive program of electrification. About 300 miles are now in service, making it by far the most pretentious French electric railroad system at present operating.

The Southern Railway of England began operation on 100 miles of track out of a total of 250 that are being electrified. This is a suburban system operating a number of lines radiating out of London.

The Japanese Government Railways has begun an extensive program of electrification in order to increase the capacity of its lines. The first step in this is the equipment of the Tokio-Kobe line as far as Kozu, a distance of 50 miles.

The Paulista Railway in Brazil is extending 25 miles from Tatu to Rio Clara. The Mexican Railway electrification is being extended 17 miles over the Maltrate incline. Various other projects have been inaugurated during the year in foreign countries.

### PROJECTS UNDER CONTEMPLATION

During the year the Pennsylvania Railroad announced that it will electrify its New York-Washington line. The first step in this will be the section from Philadelphia to Wilmington. The route is already electrified from Pennsylvania Station, New York, to Manhattan Transfer and from North Philadelphia to West Philadelphia. It will be necessary to standardize the contact system, as the former installation is at 600 volts direct current while the latter is at 11,000 volts, single phase, alternating current.

Lines of the New York Central on the west side of Manhattan Island must be electrified at once, according to the latest court decision. Though this improvement is desirable, so much is involved in the way of grade separation that it will undoubtedly be some time before the work can be undertaken.

The status of electrification has been changed somewhat by the successful construction of oil-electric locomotives driven by Diesel engines. Several of these have been tried out during the year, and show great possibilities for handling traffic where there would not be sufficient density to justify installation of full electric equipment. This should simplify the electrification problem, particularly where there are many unimportant feeder lines to be considered.

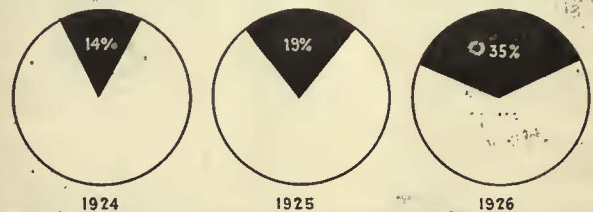


# Bus Operation by Electric Railways Broke All Records in 1925

More Companies Inaugurated Bus Service During the Past Twelvemonth than in Any Previous Year—The Number of Buses Operated More than Doubled—Purchases of New Passenger and Service Equipment Were Greater than Ever Before

PROGRESS made in bus operation by practically all the electric railways in the United States and Canada during the year just ended surpasses by a wide margin that of any previous twelve-month period. This is shown by statistics for 1925 compiled from information gathered from these companies by ELECTRIC RAILWAY JOURNAL. When statistics of bus operation by electric railways for 1924 were published in the Jan. 3, 1925, issue of this paper, showing that the number of companies furnishing such service had increased one-third during that year and that the number of buses owned had doubled, the rapidity of this development

seemed remarkable. During 1925, however, the expansion was at an even greater rate. Railway companies operating buses increased in number from 156 to 280,



Proportion of Electric Railways Operating Buses to Total Number of Companies at the First of Each Year

## Automotive Service Equipment Ordered by Railways During 1925

Name of Railway	No.	Type of Chassis	Body Builder	Name of Railway	No.	Type of Chassis	Body Builder
<b>Connecticut</b>				<b>Indiana</b>			
Connecticut Co.	6	1 Ton Truck	Ford	Beech Grove Trac. Co.	1	1 Ton Truck	Ford
	1	1 Ton Truck	Dodge	Hammond, Whiting & East			
	2	1/2 Ton Truck	Ford	Chicago Ry.	1	Tower Truck	White
	1	3/4 Ton Truck	White	<b>Kentucky</b>			
<b>Maine</b>				Louisville Ry.	1	1 Ton Truck	Ford
York Utilitiea Co.	1	Reo Speed Wagon Chassis			1	2 Ton Tower Truck	Dodge-Graham
<b>Massachusetts</b>				<b>Michigan</b>			
Eastern Mass. St. Ry.	3	1 Ton Truck	Ford	Dept. of St. Rys., Detroit	28	Service Truck	
	1	1 1/2 Ton Truck	Cadillac	Milwaukee Elec. Ry. & Lt. Co.	2	3 Ton Exp. Truck	Int. Harvester (Stoughton)
Springfield St. Ry.	1	2 Ton Truck	Federal		37	Truck	White-Sterling
<b>District of Columbia</b>				<b>Minnesota</b>			
Washington Ry. & Elec. Co.	8	Service Truck		Duluth St. Ry. Co.	1	2 Ton Tower Truck	White
<b>New Jersey</b>					1	1 1/2 Ton Dump Truck	Ford
Trenton & Mercer County Trac. Corp.	3	1 1/2 Ton Truck	Mack		1	1 Ton Truck	Ford
<b>New York</b>				Mesaba Ry. Co.	1	Gas Tank Truck	White Chassis
Black River Trac. Co.	1	Snow Plow	G. M. C.		1	1 1/2 Service Truck	Graham
Brooklyn City R.R.	1	5 Ton Trans. Wrecker	White-Hoover	Twin City Rapid Transit Co.	3	1 Ton Trucks	Ford
	1	2 Ton Line Truck	Coml.	<b>Missouri</b>			
	3	2 1/2 Ton Line Truck	White-Trenton	United Rys. Co. of St. Louis	2	2 1/2 Ton Truck	White-U.R. Co.
	3	3 1/2 Ton Line Truck	White-Trenton		1	1 Ton Truck	Ford
	2	2 Ton Track Truck	White-Hoover		1	3/4 Ton Truck	Ford
	3	3 1/2 Ton Track Truck	White-Hoover	<b>Ohio</b>			
New York State Rys.	1	1 Ton Truck	Ford	Cleveland Ry.	3	3/4 Ton Truck	White-Klein
	2	3/4 Ton Truck	Brockway	Southern Ohio Public Service Co.	1	5 Ton Truck	White
	2	3/4 Ton Truck	Brockway	<b>Florida</b>			
	3	1 1/2 Ton Truck	Brockway	Jacksonville Trac. Co.	1	1 1/2 Ton Truck	Int. Harvester Co.
Schenectady Ry.	1	2 1/2 Ton Truck	Mack	<b>Georgia</b>			
	1	5 Ton Universal Crane Mounted on Mack Chassis		Athens Ry. & Elec. Co.	1	1 Ton Truck	Ford
United Trac. Co.	2	5 1/2 Ton Snow Plow	Walter	Columbus Elec. & Pwr. Co.	1	1 Ton Truck	Ford
	1	2 Ton Truck	Ford	Georgia Ry. & Pwr. Co.	18	3 1/2 Ton Truck	
<b>Pennsylvania</b>				<b>Tennessee</b>			
Buffalo & Erie Ry.	2	6 Ton Truck	White	Jackson Ry. & Lt. Co.	2	Service Truck	
Philadelphia Rapid Transit Co.	6	1 Ton Truck	Ford	<b>California</b>			
	8	2 1/2 Ton Truck	Mack	Los Angeles Ry. Corp.	10	Truck	
	1	Roadster	Ford	Municipal Ry., San Francisco	1	Truck	Reo
	1	1 Ton Truck	Ford	<b>Kansas</b>			
	1	5 Ton Truck	G. M. C.	United Trac. System	2	2 Ton Truck	Reo
	3	2 1/2 Ton Truck	G. M. C.	<b>Texas</b>			
Pittsburgh Rys.	2	3 1/2 Ton Trailer	P. R. T.	Dallas Ry. Co.	1	2 Ton Truck	White
	4	5 Ton Tower Truck	Mack	Wichita Falls Trac. Co.	1	Truck	Ford
	3	5 Ton Snow Plow	Walter		1	Truck	Dodge
West Penn Rys.	1	5 Ton Universal Crane	Mack	<b>Washington</b>			
	1	3 1/2 Ton Tower Truck	White	Grays Harbor Ry. & Lt. Co.	3	5 Ton Dump Truck	
<b>West Virginia</b>					1	5 Ton G. M. C.	
Norfolk & Western Ry.	1	5 Ton Truck	White		2	White	
	1	3 Ton Truck	International	Seattle Munic. Ry.	1	3 1/2 Ton Truck	G. M. C.
	1	2 Ton Truck	White		2	1 Ton Truck	Ford
	1	Speedwagon	Reo	<b>Canada</b>			
<b>Illinois</b>				B. C. Elec. Ry. Co. Ltd.	2	4 Ton Dirt Truck	Leyland-Co. Shop
Aurora Pl. Infield & Joliet Ry.	1	2 Ton Truck	Pierce Arrow		3	2 Ton Dirt Truck	Leyland-Co. Shop
Chicago & Joliet Elec. Ry.	1	Tractor	Fordson		2	2 1/2 Ton Truck	Federal-Co. Shop
Chicago North Shore & Milwaukee R.R.	2	5 Ton Tractor	White		1	1 Ton Truck	Federal-Co. Shop
Chicago Rapid Transit Co.	1	2 1/2 Ton Truck	White	Niagara, St. Catharines & Toronto Ry.	1	2 1/2 Ton Truck	Leyland
	2	3/4 Ton Truck	Ford		1	2 Ton Truck	Federal
	1	1 Ton Truck	Yellow Coach	Ottawa Elec. Rys. Co.	1	Tower Truck (Rep.)	Local
Chicago Surface Lines	2	5 Ton Trucks	White-Press Sons	Quebec Ry. Lt. & Pwr. Co.	1	Gas-Elec. Snow Plow	Cummings
	1	3 Ton Truck	Auto Car-Voltz Bros.	Winnipeg Elec. Co.	1	Gas-Elec. Snow Plow	Cummings
	10	3 Ton Truck	White-C. S. L.	Total	284		
	1	2 1/2 Ton Truck	Mack-Press Sons				
East St. Louis Ry.	1	1 1/2 Ton Truck	Dodge-Graham				
	1	Tower					
Illinois Traction, Inc.	22	1 Ton Truck	Ford				







a gain of 124, or approximately 80 per cent. Of this number about twenty small properties have entirely, or almost entirely, given up their rail service and operate only buses.

An increase occurred in the number of buses owned from 2,462 to 5,358, a gain of 2,896, or 117 per cent. Orders for new equipment placed in 1925 were more than twice those of the year before.

Looking back to the figures published in the statistical issues of this paper for 1924, it will be seen that the number of bus operating companies was 121, and the number of buses slightly more than 1,200. The next year the number of companies was 156, an increase of 29 per cent, and the number of buses was 2,462, an increase of 105 per cent. Figures for 1925 given in the preceding paragraph show a considerably larger increase, and thus break all records. The proportion of electric railways operating buses to the total number of companies is shown graphically in an accompanying chart.

While the figures show that approximately 35 per cent of the railways have undertaken bus operation, the actual number of automotive vehicles is small in comparison to the number of electric railway cars, there being only some 5,000 of the former as against 82,000 of the latter, or about 6 per cent. It is estimated that passengers carried annually by electric railway buses number approximately 800,000,000, while those carried by the rail lines are about 16,000,000,000.

Route mileage of bus lines compares favorably with that of the car lines. Bus routes total approximately 13,000 miles, as against 46,000 miles of electric railway single track. A considerable part of the railway mileage, however, is double track, so that the total mileage of rail route is less than the total single-track mileage. The difference between the ratio of the number of vehicles, which is 16 to 1, and the ratio of the number of miles of route, which is about 2½ to 1, is accounted for by the fact that buses are more often used on light traffic lines in outlying sections, where the service is infrequent, than on heavy urban lines, where the number of vehicles per mile of track is large. These comparisons are graphically shown in accompanying charts.

It is interesting to note that a large portion of the 13,000 miles of bus route represents new service given by the railways, compared to which the

Buses Ordered by Railways During 1925

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
<b>Connecticut</b>					
Connecticut Company.....	35	2	Mack	Mack	29
		4	Mack	Kuhlman	29
		3	White	Kuhlman	29
		2	White	Hoover	29
		24	Yellow Coach	Yellow Coach	29
Hartford & Springfield St. Ry.....	7	3	Mack	Mack	29
		2	Yellow Coach	Patterson	25
		2	Graham	Patterson	16
Waterbury & Milldale Tramway.....	3	1	White	Kuhlman	24
		1	White	Kuhlman	25
		1	White	Kuhlman	29
<b>Maine</b>					
Central Maine Power Co.....	1	1	White	.....	25
York Utilities Co.....	2	2	G. M. C.	Wisbach	21
<b>Massachusetts</b>					
Boston Elevated Railway.....	92	19	White	Brown	25
		11	White	Brown	29
		9	Mack	Mack	25
		22	Mack	Mack	29
		18	International	Niagara	25
		4	Yellow Coach	Yellow Coach	29
		1	Fageol	Fageol	29
		8	Miscellaneous	.....	.....
Boston & Worcester St. Ry.....	7	7	Mack	.....	29
Eastern Mass. St. Ry.....	16	5	Fageol	Fageol	31
		4	Fageol	Fageol	29
		6	Int. Harvester	Int. Harvester	29
		1	White	Brown	29
Gardner-Templeton St. Ry.....	1	1	Dodge	Graham	20
Middlesex & Boston St. Ry.....	21	21	White	Bender	29
New Bedford & Onset St. Ry.....	1	1	Reo	Boston Body Co	21
Plymouth & Brockton St. Ry.....	1	1	Reo	Boston Body Co	20
Springfield St. Ry.....	16	1	Federal	Brown	25
		3	Garford	Wason	21
		1	Garford	Garford	25
		8	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	21
Union Street Railway.....	7	2	Mack	Mack	21
		1	Pierce Arrow	Brown	18
		3	Pierce Arrow	Brown	26
		1	Pierce Arrow	Brown	29
Worcester Consolidated St. Ry.....	12	2	White	Brown	25
		1	Pierce	Brown	29
		2	Mack	Mack	29
		4	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	25
<b>New Hampshire</b>					
Laconia St. Ry.....	4	4	Reo	Boston Body Co	21
Portsmouth Electric Ry.....	8	8	White	Brown	29
<b>Rhode Island</b>					
Newport Electric Corp.....	11	5	Fageol	Fageol Parlor Car	29
		2	Fageol	Fageol Delux St. Car	29
		4	Fageol	Fageol St. Car	29
Newport & Providence Ry.....	6	.....	.....	.....	.....
United Electric Rys.....	12	2	Yellow Coach	Yellow Coach	29
		1	White	Brown	29
		5	Reo	Fitzjohn	21
		4	Yellow Coach	Yellow Coach	29
<b>District of Columbia</b>					
Capital Traction Co.....	15	8	Yellow Coach	Yellow Coach	21
		2	Yellow Coach	Yellow Coach	21
		3	Reo	Reo	16
		2	Reo	.....	21
Washington Ry. & Elec. Co.....	24	7	Graham	Hoover	20
		7	Six Wheel Co	Am. M. B. Corp.	27
		6	Yellow Coach	Yellow Coach	27
		2	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
Washington & Old Dominion Ry.....	1	1	Graham	Graham	21
Washington-Virginia Ry.....	9	9	Fageol	Fageol	29
<b>Maryland</b>					
Cumberland & Westernport Elec. Ry.	3	3	White	Hoover	21
United Ry. & Elec. Co.....	9	6*	5th Ave	5th Ave.	55
		2	Yellow Coach	Yellow Coach	29
		1	Yellow Coach	Yellow Coach	23
<b>New Jersey</b>					
Morris County Traction Co.....	3	2	G. M. C.	.....	14
		1	Reo	.....	30
Ocean City Elec. R.R.....	1	1	Reo	Reo	15
Public Service Railway.....	483	333	Gas-electric	Yellow Coach	29
		68	White	.....	25
		44	Mack	.....	29
		3	Fageol	.....	29
		3	Yellow Coach	.....	29
		32	Miscellaneous	.....	.....
Trenton & Mercer County Traction Co.	8	6	Fageol	Fageol	29
		2	Mack	Mack	29
<b>New York</b>					
Auburn Syracuse Elec. Ry.....	4	4	Dodge	Graham	21
Black River Traction Co.....	3	3	G. M. C.	Railway Shops	16
Empire State R.R.....	6	6	Dodge	Graham	21
New York State Rys. (Rochester) ...	12	1	White	Bender	22
		1	White	Brown	29
		8	White	Bender	29
		1	Mack	Mack	25
		1	Studebaker	Autobody	21
New York State Rys. (Syracuse) .....	8	4	Brockway	Bender	25
		3	White	Bender	25
		1	Mack	Bender	25
New York State Rys. (Utica) .....	5	1	Mack	Bender	25
		1	Mack	Bender	25
		2	White	Bender	25
		1	Reo	Reo	21
Olean, Bradford & Salamanca Ry....	1	1	Clydesdale	Miller	16
Rochester & Syracuse R.R.....	1	1	Larabee	Whitfield	14
Syracuse & Eastern R.R.....	1	1	Reo	Patterson	25
United Traction Co.....	21	18	Fageol	Fageol	29
		3	Mack	Mack	25



mileage of rail route entirely replaced by bus lines is small. During 1925 extensions to bus routes operated by electric railways totaled about 3,500 miles. Of this less than one-tenth represented replacement of car service. City bus routes gained about 900 miles. New intercity routes totaled some 2,400 miles, while touring and sightseeing lines added another 140 miles. On the other hand, operation of about 12 miles of city bus route was abandoned by the railways and nearly 150 miles of interurban route.

Details of the developments during the year have been published in this paper from time to time and can only be summarized briefly here. Electric railways which added more than 200 buses during the year are the Public Service Railway, Newark, N. J., and the Philadelphia Rapid Transit Company. How the development of coordinated transportation in New Jersey has resulted in the former company becoming the largest bus operator in the United States was told in the issue of this paper for Nov. 28. Gas-electric bus operation inaugurated during the early part of the year by the Philadelphia Rapid Transit Company has been discussed widely and is being observed with interest by the industry.

One of the largest increases in 1925 in the number of buses owned by an electric railway occurred in Michigan, where the Detroit United Railways acquired 180 such vehicles. For the purpose of carrying its interurban passengers downtown from transfer stations on the outskirts of the city, this railway bought 40 single-deck Yellow coaches. An article on this subject was published in ELECTRIC RAILWAY JOURNAL for May 2, 1925. Purchase of competing independent bus lines was largely responsible for the remainder of the 180 buses acquired by the D. U. R.

In Norfolk, the Virginia Electric & Power Company, formerly the Virginia Railway & Power Company, purchased 102 competing buses and 22 new vehicles, making a total of 124. The Cleveland Railway has ordered more than 100 new buses. At present not all of these have been delivered and the full service has not been established. Ninety-two buses were added to the fleet operated by the Boston Elevated Railway. The Northern Ohio Traction & Light Company has greatly extended its bus service in the Akron and Canton districts, practically doubling the number of such vehicles in service. One of the pio-

Buses Ordered by Railways During 1925—(Continued)

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
<b>Pennsylvania</b>					
Beaver Valley Traction Co.....	2	1	Pierce Arrow	Thompson	25
		1	Mack	Mack	25
Chambersburg & Shippensburg Ry....	2	2	Garford	Garford	17
Citizens Traction Co.....	4	4	Fageol	Fageol	29
Erie Railways.....	4	4	Yellow Coach	Yellow Coach	29
Lehigh Traction Co.....	10	10	Mack	Mack	25
Lehigh Valley Transit Co.....	5	5	Mack	Mack	25
Pittsburgh, Harmony, Butler & New Castle Ry.....	3	1	Reo..	Reo	21
		2	Reo	Reo	17
Schuylkill Ry.....	4	4	Reo.	Paterson	18
Scranton Ry.....	2	2	Dodge	Graham	20
Westmoreland County Ry.....	3	1	Fageol	.....	29
		1	Garford	.....	23
		1	Dodge	.....	15
Westside Electric St. Ry.....	2	2	Mack	Mack	25
<b>Virginia</b>					
Roanoke Ry. & Elec. Co.....	3	3	Dodge	Graham	17
Virginia Elec. & Power Co.....	22	7	Reo	Reo	21
		5	White	Bender	23
		10	Mack	Amco	27
<b>West Virginia</b>					
Charleston Interurban R.R.....	3	3	Menominee	Thompson	25
Ohio Valley Elec.Ry.....	7	3	Graham	.....	17
		4	Graham	.....	21
Monongahela-West Penn Pub. Serv. Co.	2	1	Fageol	Fageol	22
		1	Yellow Coach	Yellow Coach	21
Wheeling Traction Co.....	2	2	Fageol	.....	29
<b>Illinois</b>					
Aurora Elgin & Fox River Elec. Co...	3	2	White	Schaefer	25
		1	Fageol	Fageol	30
Central Illinois Pub. Serv. Co.....	5	2	Dodge	Graham	17
		3	Reo	Reo	21
Chicago & Joliet Elec. Ry.....	6	4	Mack	Mack	21 to 25
		2	Graham	Graham	21 to 25
Chicago, No. Shore & Milwaukee R.R.	6	2	Fageol	Fageol	22
		3	Studebaker	Studebaker	18
		1	Pierce Arrow	Bender	16
Chicago & West Towns Ry.....	10	10	Reo	Cunningham	21
East St. Louis Ry.....	6	3	Mack	St. Louis Car	29
		1	Mack	Mack	29
		1	Yellow Coach	St. Louis Car	29
		1	Yellow Coach	Yellow Coach	29
Illinois Power Co.....	3	3	.....	.....	29
Illinois Pwr. & Lt. Corp. (Bloomington)	6	6	Mack	Mack	25
Illinois Pwr. & Lt. Corp. (Champaign) ..	9	3	Yellow Coach	Yellow Coach	29
		6	White	White	25
Illinois Pwr. & Lt. Corp. (Danville) ...	4	4	Yellow Coach	Yellow Coach	29
Illinois Pwr. & Lt. Corp. (Galesburg) ...	7	5	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
Illinois Pwr. & Lt. Corp. (Peoria) .....	9	8	Yellow Coach	Yellow Coach	29
		1	International	.....	29
Illinois Pwr. & Lt. Corp. (Quincy)....	8	8	White	.....	25
Illinois Traction System (Main Line)..	2	2	Yellow Coach	Yellow Coach	21
Illinois Traction System (Valley Div.)..	1	1	International	.....	25
Joliet Plainfield & Aurora Transp. Co.	1	1	Pierce Arrow	.....	30
Rockford City Traction Co.....	3	3	Yellow Coach	Yellow Coach	29
<b>Indiana</b>					
Chicago South Bend & Northern Indiana Ry.....	6	6	Reo	Fitzjohn	21
Gary Rys.....	45	13	Yellow Coach	Yellow Coach	29
		9	Yellow Coach	Yellow Coach	21
		13	Int. Harvester	Lang	24
		2	Int. Harvester	Lang	21
		8	Int. Harvester	Int. Harvester	12
Indianapolis & Cincinnati Traction Co.	4	4	Fageol	Fageol	31
Indianapolis St. Ry.....	24	24	Yellow Coach	Yellow Coach	29
Indiana Service Corp.....	5	5	Int. Harvester	Int. Harvester	20
Interstate Pub. Serv. Co.....	8	2	Studebaker	.....	19
		4	Fageol	.....	22
		2	Reo	.....	20
Northern Indiana Power Co.....	2	2	Int. Harvester	Int. Harvester	12
Southern Indiana Gas & Elec. Co.....	6	6	Dodge	Graham	21
Terre Haute, Indianapolis & Eastern...	10	5	Yellow Coach	Yellow Coach	29
		5	Reo	Reo	21
Union Traction Co.....	10	5	Reo	Fitzjohn	21
		5	White	Kuhlman	25
<b>Iowa</b>					
Dubuque Electric Co.....	4	4	Mack	Mack	25
Iowa Southern Utilities Co. (Burlington)	4	4	Mack	Mack	25
Iowa Southern Utilities Co. (Centerville)	3	3	Graham	Graham	21
Waterloo, Cedar Falls & Northern Ry.	2	2	Mack	Mack	29
<b>Kentucky</b>					
Kentucky Traction & Terminal Co...	5	5	White	Kuhlman	25
Louisville Ry.....	5	4	Yellow Coach	.....	29
		1	White	Bender	25
<b>Michigan</b>					
City of Detroit, Dept. of St. Rys.....	135	123	Dodge	Graham	21
		12	Reo	Reo	29
Detroit United Ry.....	40	40	Yellow Coach	Yellow Coach	29
Grand Rapids Ry.....	2	2	Yellow Coach	Yellow Coach	21
Michigan R.R.....	14	14	Fageol	Fageol	26
Michigann Elec. Ry.....	12	12	Fageol	Fageol	26
<b>Minnesota</b>					
Duluth St. Ry.....	4	2	White	Eckland	...
		2	Mack	Eckland	...
Meaaba Ry.....	9	3	Mack	Eckland	20
		3	White	Eckland	20
		3	Fageol	.....	29
Twin City Rapid Transit Co.....	8	7	Mack	Eckland	...
		1	Mack	Lang	...
<b>Missouri</b>					
Kansas City, Clay County and St. Joseph Ry.....	5	1	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	18
		1	Studebaker	.....	18
Kansas City Rys.....	67	2	Mack	Mack	29
		11	Mack	American	29
		19	Yellow Coach	American	29
		6	Yellow Coach	American	29
		5	Six Wheel	St. Louis Car Co.	31
		18*	Six Wheel	St. Louis Car Co.	63
		6	Dodge Graham	Dodge Graham	21



Buses Ordered by Railways During 1925—(Continued)

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
<b>Missouri—continued</b>					
Missouri Power & Light Co.....	3	3	Mack	Mack	25
Springfield Traction Co.....	5	3	Yellow Coach	.....	.....
		2	Dodge	Graham	.....
St. Louis Elec. Terminal Ry.....	6	6	Yellow Coach	Yellow Coach	29
United Rys. of St. Louis.....	36	5	Six Wheel	St. Louis Car	29
		24	White	St. Louis Car	29
		2	White	U. R. C.	25
		4	White	Anheuser-Busch	29
		1	Mack	St. Louis Car	29
<b>Ohio</b>					
Cleveland Ry.....	101	30	White	Kuhlman	29
		30*	Six Wheel	Six Wheel	62
		1	Six Wheel	Six Wheel	29
		10*	Six Wheel	Six Wheel	62
		30	White	Kuhlman	29
Columbus, Urbana & Western Ry....	2	2	Reo	.....	21
Indiana, Columbus & Eastern Trac. Co.	1	1	Fageol	Fageol	22
Penn-Ohio Elec. Co.....	5	5	White	Bender	25
Southern Ohio Public Service Co.....	26	5	Ace	Ace	25
		2	Fageol	Fageol	28
		3	Studebaker	Studebaker	18
		4	Fageol	Fageol	22
		12	Studebaker	Studebaker	11
Youngstown & Suburban Ry.....	3	3	Fageol	Fageol	22
Youngstown Municipal Ry.....	2	2	White	Bender	25
Stark Elec. R.R.....	6	6	Yellow Coach	Yellow Coach	21
<b>Wisconsin</b>					
Madison Railways.....	6	6	Yellow Coach	Yellow Coach	29
Milwaukee Elec. Ry. & Light Co.....	19	5	Fageol	Fageol	31
		3	Yellow Coach	Yellow Coach	31
		2	Fageol	Fageol	23
		9	Yellow Coach	Yellow Coach	29
Wisconsin Power & Light Co.....	21	4	Fageol	Fageol	25
		3	Hudson	Hudson	7
		2	Yellow Coach	Yellow Coach	27
		5	Yellow Coach	Yellow Coach	30
Wisconsin Public Service Co.....	3	2	Reo	.....	21
		1	Yellow Coach	.....	23
Wisconsin Valley Elec. Co.....	8	2	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
		2	Reo	McKinnon	13
		2	G. M. C.	McKinnon	18
<b>Arkansas</b>					
Arkansas Central Power Co.....	3	1	Yellow Coach	Yellow Coach	21
		1	Mack	Mack	21
		1	White	White	25
Hot Springs St. Ry.....	2	2	Reo	.....	.....
<b>Florida</b>					
Key West Elec. Co.....	4	4	Mack	Amer. Car Co.	29
Tampa Elec. Co.....	22	16	Mack	Birney	29
		6	Reo	Reo	21
<b>Georgia</b>					
Columbus Elec. & Power Co.....	13	8	Mack	Amer. Car Co.	29
		5	White	Amer. Car Co.	29
Georgia Ry. & Power Co.....	15	15*	Fageol	Fageol	60
Savannah Elec. & Power Co.....	2	1	Dodge	Graham	21
		1	Mack	Mack	29
<b>Louisiana</b>					
Baton Rouge Elec. Co.....	3	3	Mack	Birney	29
New Orleans Pub. Serv. Inc.....	14	1	Graham	Graham	21
		4	Yellow Coach	Yellow Coach	29
		6	Mack	Mack	29
		3	Fageol	Amer. Car Co.	29
<b>Mississippi</b>					
Mississippi Power & Light Co.....	1	1	Yellow Coach	Yellow Coach	21
Mississippi Power Co.....	10	8	Fageol	Fageol	21
		2	Reo	St. John	19
<b>North Carolina</b>					
Asheville Power & Light Co.....	2	2	White	.....	16
Carolina Power & Light Co.....	1	1	White	Bender	21
Durham Public Service Co.....	11	8	Reo	Fitzjohn	21
		3	Mack	Kuhlman	25
Southern Public Utilities Co.....	1	1	White	White	21
<b>Tennessee</b>					
Tennessee Elec. Power Co.....	5	5	Fageol	Fageol	29
<b>Arizona</b>					
Tucson Rapid Transit Co.....	5	2	Dodge	Graham	21
		2	Garford	Garford	21
		1	Reo	Locally Built	18
<b>California</b>					
Key System Transit Co.....	13	4	Dodge	Graham	16
		1	Dodge	Graham	21
		1	Pierce Arrow	.....	29
		4	Pierce Arrow	.....	25
		1	Pierce Arrow	.....	29
		2	Yellow Coach	Yellow Coach	29
Los Angeles Ry.....	40	20	.....	.....	.....
		20*	.....	.....	.....
Market St. Ry.....	1	1	Fageol	Fageol	29
Municipal Ry. of San Francisco.....	4	1	White	White	25
		3	Pierce Arrow	Cal. Motor Coach	29
Pacific Elec. Ry.....	5	3*	Fageol	.....	58
		2*	Moreland	Moreland	59
Pacific Gas & Elec. Co.....	3	3	Moreland	Moreland	16
Peninsular Ry.....	4	4	Fageol	Fageol	29
San Diego Elec. Ry.....	2	2	Dodge	Graham	.....
<b>Colorado</b>					
Denver & Interurban R.R.....	4	4	Yellow Coach	Yellow Coach	30
Denver Tramway.....	3	1	Fageol	Fageol	21
		1	Graham	Graham	21
		1	Studebaker	Auto Body Co	21
<b>Idaho</b>					
Boise St. Car Co.....	2	2	Pierce Arrow	Brown	29
<b>Kansas</b>					
Arkansas Valley Interurban Ry.....	3	3	White	.....	14
Kansas City, Leavenworth & Western Ry.....	6	5	Mack	Mack	25
		1	Graham	Graham	20
Topeka Ry.....	11	11	Mack	Mack	25

neer companies to engage in bus operation, the United Railways & Electric Company of Baltimore, in April purchased the East Fayette Street bus line in that city and added 37 more buses to the 44 which were in service at the beginning of the year.

Increase in the number of comparatively small electric railways operating buses has been relatively greater than in the number of large companies. This is because many of the larger railways were listed as operators last year. Among the newcomers of the former class are Gardner-Templeton Street Railway; Laconia Street Railway; Cumberland & Westernport Electric Railway; Black River Traction Company; Chambersburg & Shippensburg Railway; Lehigh Traction Company; Rio Grande Valley Traction Company; Wichita Falls Traction Company; Lewiston & Clarkston Transit Company; and in Canada, the Grand River Railway and the Windsor, Essex & Lake Shore Rapid Railways.

In general, the development during the past year has been greater among the urban street railways than among the interurbans. Among the new city companies now operating buses are those in Cleveland, Denver, Duluth, Erie, Indianapolis, Omaha, Pittsburgh, Portland, Wilkes-Barre and Worcester.

New bus operations by interurban electric railways have not been lacking, however. Following is a list of some of the companies which have undertaken such service: New Haven & Shore Line Railway; Boston & Worcester Street Railway; Washington & Old Dominion Railway; Auburn & Syracuse Electric Railroad; Rochester & Syracuse Railroad; Syracuse & Eastern Railroad; Lackawanna & Wyoming Valley Railroad; Charleston Interurban Railroad; Aurora, Elgin & Fox River Electric Company; Indianapolis & Cincinnati Traction Company; Terre Haute, Indianapolis & Eastern Traction Company; Denver & Interurban Railroad; Kansas City, Leavenworth & Western Railway.

Considering geographically the development of bus operation by electric railways during the past year, the largest proportionate increase is found to have been in the Southern states. Bus service has been undertaken in Atlanta, Ga.; Baton Rouge, La.; Chattanooga, Tenn.; Durham, N. C.; Hot Springs, Ark.; Key West, Fla.; Lynchburg, Va.; Roanoke, Va.; Savannah, Ga.; Tampa, Fla. Substantial increases in number of electric railways operating buses occurred also in other sections of the country, but development there was rela-



**Buses Ordered by Railways During 1925—(Concluded)**

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
<b>Nebraska</b>					
Omaha & Council Bluffs St. Ry.....	5	5	White	Weir	25
<b>Oklahoma</b>					
Northeast Oklahoma R.R.....	3	3	Dodge	Graham	21
Oklahoma Ry.....	7	4	Dodge-Graham	Graham	21
Oklahoma Union Ry.....	27	3	Reo	Reo	25
		17	Mack	Mack	25
		1	Reo	Reo	15
		1	Reo	Reo	16
		2	Reo	Reo	20
Oregon	22	3	Reo	Reo	21
		3	Dodge	Graham	21
		3	Fageol		29
		3	Yellow Coach		29
Portland Elec. Power Co.....	22	2	Yellow Coach		29
		6	Yellow Coach		21
		2	Fageol	Gas-Elec	29
		3	Yellow Coach	Gas-Elec	29
		3	Yellow Coach		29
<b>South Dakota</b>					
Sioux Falls Traction System.....	6	1	Dodge		17
	6	4	White	Eckland	25
		1	Hudson		7
<b>Texas</b>					
Abilene Traction Co.....	1	1	Reo	Fitzjohn	21
North Texas Traction Co.....	4	2	Reo	Reo	21
Rio Grande Valley Traction Co.....	5	2	Yellow Coach	Yellow Coach	21
		5	Reo	Reo	21
San Antonio Public Service Co.....	14				
Hudson Elec. Co.....	2				
Texas Electric Ry.....	6	1	Yellow Coach	Yellow Coach	29
		1	Yellow Coach	Yellow Coach	21
		3	Dodge	Graham	21
Wichita Falls Traction Co.....	2	1	Reo	Reo	16
		2	Studebaker	Studebaker	13
	2	2	Reo		21
<b>Utah</b>					
Utah-Idaho Central R.R.....	2	2	Fageol	Fageol	19
<b>Washington</b>					
Grays Harbor Ry. & Lt. Co.....	3	3	White	Local	29
Lewiston-Clarkston Transit Co.....	1	1	Studebaker	Auto Body Co.	25
Puget Sound Elec. Ry.....	4	1	Yellow Coach	Yellow Coach	17
		3	Yellow Coach	Yellow Coach	25
Puget Sound Int. Ry. & Powr. Co....	4	3	Fageol	Newell	26
		1	Studebaker	Auto Body Co.	21
Seattle Municipal Street Ry.....	10	5	Garford	Local	29
		5	Studebaker		21
<b>Canada</b>					
British Columbia Elec. Ry.....	9	6	Leyland	Local	29
	9	1	White	Local	29
		2	White	Local	29
Grand River Ry.....	3	3	Fageol	Fageol	29
Hydro Elec. Rys.....	4	4	Gotfredson	Commercial	21
Montreal Tramways.....	24	8	Yellow Coach		25
		4	White	Brown	29
		10	Six-Wheel		29
		2	Reo		29
Ottawa Elec. Ry.....	2	2	Reo	Ottawa Car Mfg. Co.	21
Toronto Transportaton Comm.....	36	3	White	T. T. C.	29
		15	Yellow Coach	T. T. C.	29
		6	Yellow Coach	T. T. C.	29
		3	Republic		30
		2	Ruggles		30
		6	Courier		30
Windsor, Essex Lake Shore Rapid Rys.	2	2	Courier		25
Winnipeg Elec. Co.....	10	2	Gotfredson	Gotfredson	18
		7	Reo	Railway Shop	21
	3	3	Dodge-Graham	Railway Shop	16
<b>Porto Rico</b>					
Ponce Elec. Co.....	3	3	Reo	Fitzjohn	21
<b>Total.....</b>	<b>2,171</b>				

\*Denotes Double-Deck

tively less pronounced. The number of companies in each geographical division as reported in the statistical issues of ELECTRIC RAILWAY JOURNAL for 1924 and 1925 are given in the accompanying table, as well as the figures for Jan. 1, 1926.

New buses ordered during 1925 numbered 2171 as compared with 963 ordered in 1924. Buses acquired with the purchase of independent companies and re-

tained in service by electric railways account for the difference between the total increase of nearly 2,900 and the amount of the orders. On the other hand, the net increase is affected by the considerable number of buses which were scrapped during the year.

Among the large purchases during 1925 were 123 Graham Brothers 21-passenger buses for the Department of Street Railways, city of Detroit. The Cleveland Railway, Kansas City Railways, Los Angeles Railway, Gary Railways, and the Boston Elevated were companies which placed large orders during the year.

In the latter part of December the Public Service Railway placed an order for 333 gas-electric buses with the Yellow Coach Manufacturing Company. Electrical equipment is to be supplied by the General Electric Company. While the exact purchase price was not announced it is said to be approximately \$3,000,000. This is the largest single order for buses that has ever been placed by any electric railway in the United States or Canada.

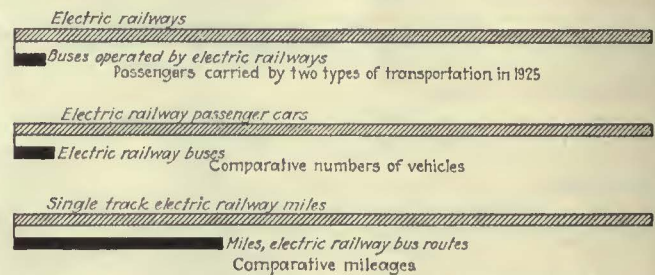
Other automotive equipment ordered by electric railways also shows a large increase over previous years. Reports received show 284 motor trucks purchased in 1925 as compared with 105 in 1924, 148 in 1923, and 112 in 1922. The 1-ton type was the most popular size, with the 3½-ton type second. Others ranged in size from ½ ton to 7 tons. None of the companies reported the purchase of any trackless trolleys.

Purchases of new equipment for the year show a slightly different trend from those of previous years. A number of companies have acquired double-deck vehicles, among them being the railways in Atlanta, Baltimore, Cleveland, Kansas City and Los Angeles. The actual number of double-deck buses shown in the table of purchases for the

year, approximately 100, is less than for the preceding year, when 191 were ordered. This is explained by the fact that the order of the Philadelphia Rapid Transit Company for 125 such vehicles was included in the sta-

**Geographical Classification of Electric Railways Operating Buses**

	Jan. 1, 1924	Jan. 1, 1925	Jan. 1, 1926
New England States.....	14	19	29
Eastern States.....	31	43	74
Central States.....	39	48	83
Southern States.....	5	9	25
Western States.....	26	28	55
Canada.....	5	9	11
Panama.....	1	..	1
Porto Rico.....	..	..	1
Hawaiian Islands.....	..	..	1
<b>To al.....</b>	<b>121</b>	<b>156</b>	<b>280</b>



**Comparison of Transportation Services Furnished by Electric Railway Companies in the United States and Canada as of Jan. 1, 1926**

Passengers carried by rail are estimated to be 16,000,000,000 and by electric railway buses approximately 800,000,000. Electric railway passenger cars number about 82,000 while some 5,300 buses are operated by these companies. Single-track electric railway mileage is 46,000 and bus routes total some 13,000 miles.



Bus Route Extensions During 1925

Name of Railway	Name of Operating Co.	City Miles	Intercity Miles	Touring Miles	Sightseeing Miles	Replaced Miles
<b>Connecticut</b>						
Connecticut Co.		10.04	79.28			38.72
Hartford & Springfield St. Ry.			9.70			9.70
Waterbury & Middale Tramway			0.75			
<b>Maine</b>						
Central Maine Power Co.			12.00			4.50
York Utilities Co.		8.50	34.50			4.50
<b>Massachusetts</b>						
Boston Elevated Ry.		25.50				32.00
Boston & Worcester St. Ry.		6.00				6.00
Eastern Massachusetts St. Ry.		13.10	38.40			8.80
Gardner-Templeton St. Ry.			5.00			
Middlesex & Boston St. Ry.		2.00				
Springfield St. Ry.		5.70				1.32
Union St. Ry. of New Bedford			34.00			
Worcester Consolidated St. Ry.		3.00	68.00			10.10
<b>New Hampshire</b>						
Portsmouth Electric Ry.	Boston & Maine Transp. Co.	18.00				18.00
<b>Rhode Island</b>						
Newport Electric Corp.		6.90	40.00			20.00
United Electric Rys.			18.88			10.10
<b>Vermont</b>						
Bellows Falls & Saxton River St. R.R.	Pierce Bus Co.	2.00	4.00			
<b>District of Columbia</b>						
Capital Traction Co.		11.03				
Washington & Old Dominion Ry.			16.80			
Washington Ry. & Electric Co.		18.65				2.63
Washington Ry. & Electric Co.	City & Suburban Ry. of Washington	2.65	14.90			5.62
Washington-Virginia Ry.			23.00			
<b>Maryland</b>						
Cumberland & Westernport Electric Ry.			22.10			16.60
United Rya. & Electric Co.	Baltimore Transit Co.	4.57		54.00		
United Rys. & Electric Co.	East Fayette St. Bus Co.	23.45			5.50	
<b>New Jersey</b>						
Morris County Traction Co.			3.00			
Trenton & Mercer County Traction Corp.	Central Transportation Co.	42.70				
<b>New York</b>						
Auburn & Syracuse Electric R.R.	Mid-State Coach Lines, Inc.	4.80				1.90
Black River Traction Co.	Watertown Transportation Co.	1.24				
Empire State R.R.	Mid-State Coach Lines, Inc.	7.00				
International Ry.	International Bus Corp.	20.70	8.09			4.42
New York State Rys.		7.50	221.00			
Olean, Bradford & Salamanca Ry.	O. B. & S. Bus Line		9.00		20.00*	9.00
Rochester & Syracuse R.R.	Mid-State Coach Lines, Inc.		13.50			
United Traction Co., Albany	Capitol District Transp. Co.	9.52				1.24
<b>Pennsylvania</b>						
Buffalo & Erie Ry.	Buffalo & Erie Coach Corp.	0.50	3.00			
Chambersburg & Shippensburg Ry.	Cumberland Valley Transit Co.	2.00	9.00			9.00
Citizens Traction Co.	Citizens Transit Co.	4.00	22.00			9.00†
Erie Rys.	Erie Coach Co.	3.00				
Lehigh Traction Co.	Hazleton Auto Bus Co.	1.40	4.50			
Lehigh Valley Transit Co.	Lehigh Valley Transportation Co.	8.09				
Monongahela-West Penn Public Service Co.			32.80			
Schuylkill Ry.	Schuylkill Transportation Co.		10.00			
Seranton Ry.		0.50	2.00			
Shamokin & Edgewood Electric Ry.	Shamokin & Trevorton Bus Line	1.00	8.00			
Stroudsburg Traction Co.	E. Stroudsburg Bus Co.	8.50				
Westmoreland County Ry.			5.00			
<b>Virginia</b>						
Roanoke Ry. & Electric Co.	Roanoke Rapid Transit Co.	2.60	8.50			
Virginia Electric & Power Co.	Richmond Rapid Transit Co.	9.00				
Virginia Electric & Power Co.		17.00				
<b>West Virginia</b>						
Charleston Interurban R.R.		2.50				
Monongahela West Penn Public Service Co.			32.80			
<b>Illinois</b>						
Aurora, Elgin & Fox River Electric Co.			12.48			8.91
Central Illinois Public Service Co.		9.00				7.41
Chicago & Joliet Electric Ry.		6.00				
Chicago North Shore & Milwaukee R.R.			123.50		*	
Chicago & West Towna Ry.		4.50				
East St. Louis Ry.		3.40	3.60			2.00
Illinois Power Co.		2.08				
Illinois Power & Light Corp.		0.75				0.75
Rockford City Traction Co.		3.30				
Rockford & Interurban Ry.			33.50			
<b>Indiana</b>						
Indianapolis & Cincinnati Traction Co.			28.00			
Indianapolis Street Ry.		56.88				
Interstate Public Service Co.			103.00			
Terre Haute, Indianapolis & Eastern Trac. Co.		10.40				
Gary Rys.		34.00	250.00			
Union Traction Co.			127.60			
<b>Iowa</b>						
Dubuque Electric Co.		5.30				
Iowa Southern Utilities Co., Burlington		7.00				2.50
<b>Kentucky</b>						
Kentucky Traction & Terminal Co.	Kentucky Coach Co.	10.00				
Louisville Ry.	Kentucky Carriers	4.90				
<b>Michigan</b>						
Department of St. Rys., Detroit		79.97				
Grand Rapids Ry.		1.42				
Michigan Electric Ry.	Southern Michigan Transportation Co.		105.50			
Detroit United Rys.		25.40	10.40			14.60

\* Summer operation only.

† Titusville Traction Co.



## Bus Route Extensions During 1925—(Concluded)

Name of Railway	Name of Operating Co.	City Miles	Intercity Miles	Touring Miles	Sightseeing Miles	Replaced Miles
<b>Minnesota</b>						
Duluth St. Ry.	Duluth Coach Co.	2.00	8.15			
Twin City Rapid Transit Co.	Twin City Motor Bus Co.		52.30			
<b>Missouri</b>						
Kansas City Clay County & St. Joseph Ry.			60.00			
Kansas City Rys.		43.98				
Missouri Power & Light Co.		3.00				
St. Louis Terminal Ry.		8.75				
United Rys. of St. Louis	St. Louis Bus Co.	17.45			1.50	
United Rys. of St. Louis	Missouri Electric R.R.		12.90			
<b>Ohio</b>						
Cleveland Railway		40.14				1.76
Community Traction Co.		0.51				0.51
Indiana, Columbus & Eastern Traction Co.	Dayton & Columbus Transportation Co.		24.00			
Stark Electric R.R.		10.00				3.00
<b>Wisconsin</b>						
Madison Rys.		10.00				
Milwaukee Electric Ry. & Light Co.		5.82	103.00			1.28
Wisconsin Power & Light Co.		2.00	283.50	25.00		2.00
Wisconsin Valley Electric Co.		1.70				
<b>Florida</b>						
Key West Electric Co.		2.30				1.90
Tampa Electric Co.		6.00				
<b>Georgia</b>						
Columbus Electric & Power Co.	Columbus Transp. Co.	12.41				5.92
Georgia Ry. & Power Co.	Atlanta Coach Co.	19.20				
Georgia Ry. & Power Co.	Georgia Ry. & Light Co.	3.81				
Savannah Electric & Power Co.		1.25				0.41
<b>Louisiana</b>						
Baton Rouge Electric Co.		2.60				
New Orleans Public Service, Inc.		5.91				1.12
<b>North Carolina</b>						
Asheville Power & Light Co.		2.00				
Carolina Power & Light Co.		1.50				
Durham Public Service Co.		8.50				4.10
<b>Tennessee</b>						
Tennessee Electric Power Co.		5.50				
<b>Arizona</b>						
Tucson Rapid Transit Co.		5.15				
<b>California</b>						
Los Angeles Ry.		18.70				
Municipal Ry. of San Francisco		1.30				
Peninsular Ry.		3.87				3.87
San Diego Electric Ry.		4.50				
Pacific Gas & Electric Co.		3.93				
Market St. Ry.		0.82				1.38
<b>Kansas</b>						
Arkansas Valley Interurban Ry.		8.00	68.50			
Kansas, Leavenworth & Western Ry.	Leavenworth Transportation Co.	5.36				5.36
Topeka Ry.		8.80				
<b>Nebraska</b>						
Omaha & Council Bluffs St. Ry.		8.50				
<b>Oklahoma</b>						
Northeast Oklahoma R.R.			11.00			
Oklahoma Ry.		7.00				
<b>Texas</b>						
Abilene Traction Co.		4.00				
Wichita Falls Traction Co.		3.00				
<b>Washington</b>						
Grays Harbor Ry. & Light Co.	Twin City Transit Co.	1.80				
Lewiston & Clarkston Transit Co.		8.00				
Pacific Northwest Traction Co.			102.00			
Portland Electric Power Co.		6.64				
Seattle Municipal Street Ry.		10.60				1.10
<b>Canada</b>						
British Columbia Electric Ry.		2.20	12.00			
Grand River Ry.		2.50	2.00			4.50
Montreal Tramways		10.85	8.80			
Toronto Transportation Commission		6.24			34.00	
Windsor, Essex & Lake Shore Rapid Ry.	Highway Motor Coach Lines	6.38	30.23			
<b>Porto Rico</b>						
Ponce Electric Co.		3.00				
Totals		936.41	2,399.46	79.00	61.00	297.53

tistics for 1924, although the vehicles did not actually go into service until the present year.

Gas-electric buses have appeared for the first time this year in a number of localities. Besides those of the Philadelphia Rapid Transit Company and the recent order by the Public Service Railway, gas-electrics have been purchased by the Georgia Railway & Power Company, the Kansas City Railways and the United Traction Company of Albany, N. Y. A feature of certain of the buses bought by the Kansas City Railways is an automatic rear exit. This is the first time that such a device has been tried and thus far the Kansas City company is the only operator to include this feature.

The parlor car type of bus appears to be growing in popularity as compared with the so-called street car type, although the number of the latter type purchased during the past year remains somewhat larger than the number of the de luxe type. An interesting example of the way these may be used by an electric railway is the operation of the Chevy Chase bus line of the Capital Traction Company, Washington, D. C. Under this plan commodious buses are operated from the Chevy Chase residential district downtown to the shopping section of the city. An extra fare is charged on account of the superior quality of the transportation service which is provided.



# Electric Railway Costs and Fares Continue Stable in 1925

Only a Few Points Variation Has Occurred in Major Index Figures During the Year—Discussion of Trends Indicates Stability for Coming Year—Several Changes in Method of Computing Figures

By *Albert S. Richey*

Electric Railway Engineer, Worcester, Mass.

ON THE following page there is a chart showing graphically the course during the past twelve years of five index numbers which may be of interest to electric railway owners and operators. The indexes included are of (1) wholesale commodities, (2) electric railway construction costs, (3) electric railway operating material costs, (4) electric railway wages, and (5) street railway fares. Accompanying the graphic presentation is a tabulation showing the average indexes for each year, 1913 through 1920 inclusive, and the monthly indexes from January, 1920, to and including the latest available data. Each index is shown on the base of 1913 = 100. The five indexes here shown are among the twelve which make up the *Conspectus of Indexes* which is compiled monthly by the writer and published regularly in the Financial and Corporate section of the *ELECTRIC RAILWAY JOURNAL*—usually in the fourth issue of each month. Similar charts and tables have been published in the *Annual Statistical Numbers*—the first issue of the *JOURNAL* in January in 1923, 1924 and 1925. At this time the new Electric Railway Construction Cost Index of the American Electric Railway Association is included, replacing the general Construction Cost Index of the *Engineering News-Record* which has appeared in the charts previously published.

## COMPUTATION OF THE INDEXES

The various indexes and the methods used in their computation will be given here, inasmuch as it has been two years since this résumé has included such a statement, and as additional data are now included. The Wholesale Commodity Index of the United States Bureau of Labor Statistics represents the course of the weighted average price of more than 400 commodities, as computed monthly by the bureau. This index is perhaps the most authoritative, the most widely used, and most often quoted of any which purports to show the trend of the general price level. The various commodities on which prices are collected and used in the computation of this index include groups such as farm products, foods, cloths and clothing, fuel and lighting, metals and metal products, building materials, chemicals and drugs, house furnishing goods, and miscellaneous items. Separate indexes are published by the bureau covering these constituent groups as well as the all-commodity index which represents the combination of all groups and which is the one here quoted. The latest bulletin of the Bureau on Wholesale Prices is No. 390, issued in July, 1925, and covering the period 1890 to 1924. This bulletin contains a description of the weightings and the methods used in computing these

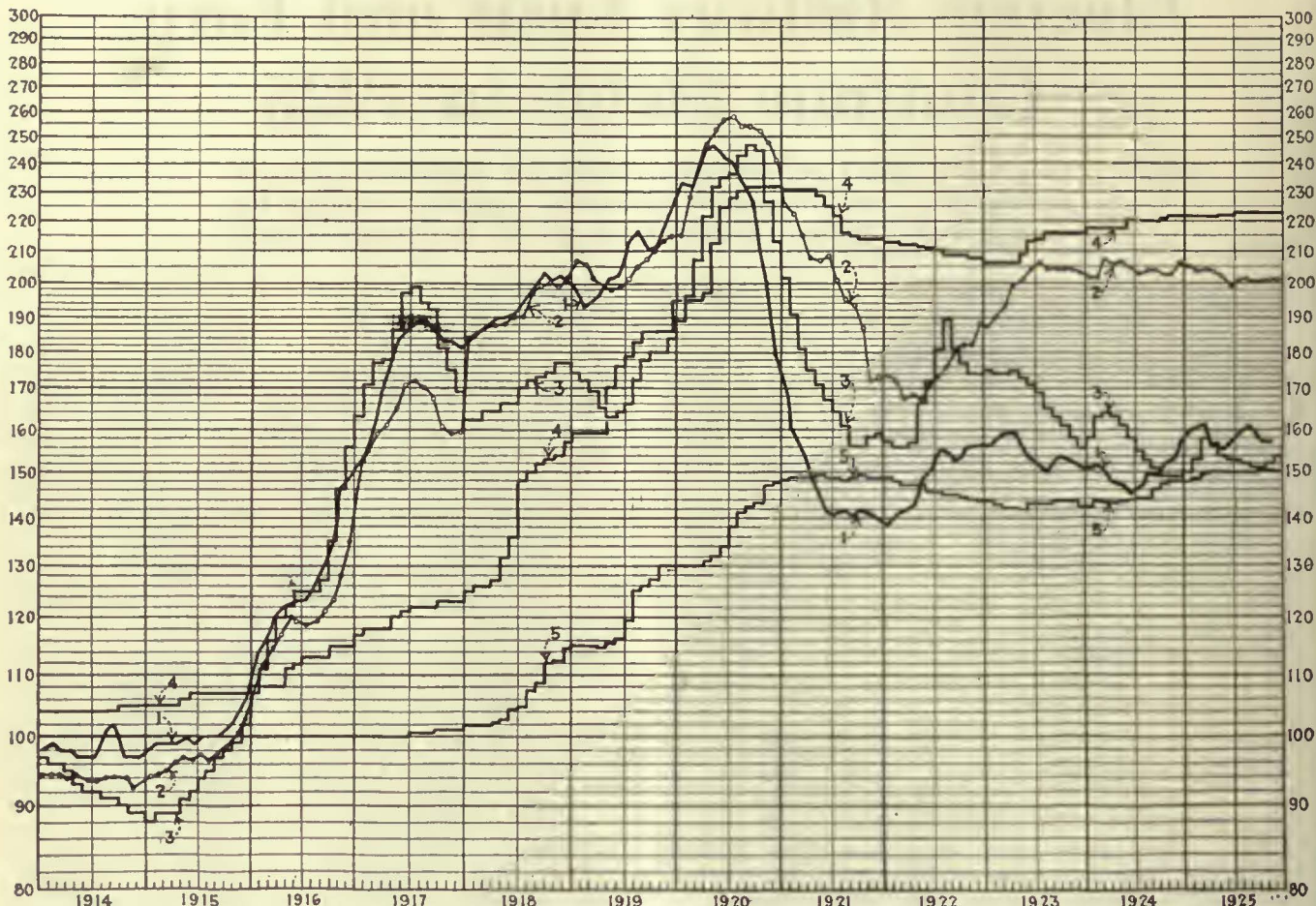
indexes, together with data as to actual and relative prices of the various commodities and relative prices of the groups of commodities which enter into the index. The index numbers as shown in that bulletin cover the entire period beginning with 1890, in which year the all-commodities index stood at 80.5. Its low point was 66.7 for the year 1896, after which year it gradually increased, reaching a value of 100.9 in 1910. Its course since 1913 is shown by the data included herewith.

The Electric Railway Construction Cost Index of the American Electric Railway Association was proposed by the valuation committee of that association at the Atlantic City convention last October. The report of that committee, quoted on page 584 of the Oct. 10, 1925, issue of the *JOURNAL*, contains a description of the data and method used in their compilation. It is still in a tentative form and subject to change as data are received from members of the association comparing actual valuation figures with the index as proposed. It may be assumed, however, that it is a fairly good index of the construction cost of the average electric railway, excluding land values, and it may be used to determine at least approximately what figure might be arrived at by a valuation of an electric railway property on the basis of present prices, if a valuation of the same property has been made at some previous time, using prices then current. The index here shown for the year 1916 is not as printed in the report of the valuation committee last October, as it has been corrected here to correspond with changes which are just now being made by the *Engineering News-Record* in its indexes of common labor and general construction costs, these being constituent elements of the Electric Railway Construction Cost Index. The change thus made necessary in this index for the year 1916 brings it more closely in line with available data on electric railway valuations.

The Electric Railway Operating Materials Cost Index is not one of construction costs but applies to the materials used in electric railway maintenance and operation. The weighting of the cost of such materials differs, of course, from that used in a construction cost index, and there is a further material difference in that this index does not include any labor costs which make up so large a part of the first cost of railway construction. The index, however, does include fuel cost, at a weighting of 40 per cent of the total. While many railways purchase power, most power contracts include a so-called coal clause which varies the price of power with the cost of coal, and it is for this reason that the cost of fuel for power is included in the index,



Trend of Construction Costs, Wages and Fares, 1913-1926, as Collected by Albert S. Richey



- 1. Wholesale prices all commodities (U. S. Bureau of Labor Statistics).
- 2. Electric railway construction costs (American Electric Railway Association statistics).
- 3. Electric railway operating materials costs (Richey). Includes fuel for power and weighted according to average use in maintenance and operation.
- 4. Electric railway wages (Richey).
- 5. Street railway fares (Richey). U. S. cities (except New York) weighted according to population.

	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)	
1913 average.....	100.0	100.0	100.0	100.0	100.0	September.....	153.3	180.5	181.0	207.8	144.8
1914 average.....	98.1	94.0	92.6	104.2	100.0	October.....	154.1	182.4	176.9	207.8	144.6
1915 average.....	100.8	97.3	93.5	106.2	100.1	November.....	155.5	182.6	174.4	207.5	144.1
1916 average.....	126.8	119.8	126.2	111.6	100.1	December.....	156.2	187.4	174.1	207.7	143.7
1917 average.....	177.2	162.7	181.9	120.6	100.5	1923					
1918 average.....	194.3	192.5	168.8	140.5	106.2	January.....	155.8	187.3	175.2	207.1	143.4
1919 average.....	206.4	205.1	172.2	174.0	120.7	February.....	156.7	190.6	173.9	207.1	143.4
1920 average.....	226.2	244.7	224.6	217.3	137.2	March.....	158.6	194.8	174.2	206.8	142.4
1920						April.....	158.7	199.0	175.3	207.0	142.3
January.....	233.2	214.4	189.3	195.0	129.9	May.....	156.2	201.0	173.1	209.0	142.1
February.....	232.4	227.7	196.2	195.0	129.9	June.....	153.5	204.1	171.3	212.6	142.9
March.....	234.4	234.1	207.3	195.0	130.2	July.....	150.6	205.3	169.1	213.5	142.9
April.....	244.6	246.1	221.1	197.0	131.1	August.....	150.1	204.3	165.5	216.2	142.9
May.....	246.7	252.9	231.7	213.0	131.9	September.....	153.7	204.0	163.2	216.4	143.4
June.....	243.3	256.1	235.6	226.0	134.0	October.....	153.1	204.3	160.9	216.4	143.5
July.....	240.7	256.4	237.3	228.0	138.0	November.....	152.1	204.4	158.3	216.4	143.5
August.....	231.4	254.0	242.7	231.0	141.5	December.....	151.0	203.3	155.5	216.4	142.4
September.....	226.2	254.2	247.5	232.0	142.6	1924					
October.....	211.3	252.0	245.2	232.0	143.3	January.....	151.2	203.0	158.5	217.4	142.6
November.....	196.4	247.6	227.4	232.0	147.0	February.....	151.7	203.8	163.2	217.4	143.1
December.....	179.2	240.6	213.4	232.0	147.5	March.....	149.9	206.8	163.9	217.5	143.1
1921						April.....	148.4	205.5	162.8	217.7	143.2
January.....	169.8	224.9	201.6	231.5	148.2	May.....	146.9	206.7	160.8	217.8	143.5
February.....	160.1	223.4	190.8	231.4	148.6	June.....	144.6	204.8	157.6	220.0	143.8
March.....	155.4	215.9	180.8	231.4	148.9	July.....	147.0	203.7	154.9	220.0	144.2
April.....	147.9	208.0	174.7	231.3	149.1	August.....	149.7	204.3	152.6	220.0	144.3
May.....	145.5	207.3	171.0	228.2	149.6	September.....	148.8	204.3	151.4	220.1	146.2
June.....	141.6	208.0	166.6	224.6	148.9	October.....	151.9	203.2	148.5	220.6	149.1
July.....	141.0	200.8	163.6	221.3	149.0	November.....	152.7	203.7	148.6	220.7	149.5
August.....	141.5	195.3	160.4	215.5	148.7	December.....	157.0	205.6	148.7	220.8	149.6
September.....	141.5	193.6	156.1	215.1	148.9	1925					
October.....	141.6	186.6	156.3	214.3	149.6	January.....	160.0	205.3	150.3	221.0	149.6
November.....	140.7	172.4	158.0	214.2	148.9	February.....	160.6	203.9	153.1	221.0	149.6
December.....	139.8	172.6	159.1	214.0	148.6	March.....	161.0	204.4	158.4	221.5	149.9
1922						April.....	156.2	204.1	157.3	221.6	150.0
January.....	138.3	172.6	157.0	212.6	148.6	May.....	155.2	202.0	153.9	222.2	150.0
February.....	141.4	171.9	156.4	212.6	147.8	June.....	157.4	200.0	152.4	222.4	150.0
March.....	142.2	167.7	155.8	211.9	147.4	July.....	159.9	200.1	152.6	222.5	150.2
April.....	142.6	168.6	157.0	211.9	147.4	August.....	160.4	201.0	151.6	222.6	150.3
May.....	147.6	167.4	166.0	211.5	147.4	September.....	159.7	200.5	150.9	222.7	150.6
June.....	149.6	171.0	172.0	210.8	145.5	October.....	157.6	202.7	150.9	222.8	151.0
July.....	154.9	173.8	180.8	210.2	145.5	November.....	157.7	202.4	152.0	222.8	150.7
August.....	155.0	176.0	188.9	208.3	144.9	December.....	.....	202.2	153.9	223.0	150.7



which may therefore be taken as an index of the cost of operating materials including power cost, when the latter is purchased under a coal clause. The remaining 60 per cent of the weighting of the materials index is made up of the costs of metals and metal products, lumber and building materials. The weighting of these individual items was determined upon after a careful study of the cost of materials used by a number of railway companies in various parts of the country over a period of years.

The Index of Electric Railway Wages as here shown is as computed monthly by the writer. The data used are the maximum wage rates of conductors and motor-men on two-man cars on 144 companies in the United States, employing a total of 108,175 platform men. These rates are weighted on the basis of the number of platform men employed by the various companies; the index therefore indicates the trend of the average platform man's hourly rate of wage. Previous to October, 1924, this index was weighted according to the number of passenger cars operated by the various companies. As noted on page 787 of the JOURNAL for Nov. 1, 1924, the weighting then was changed to the number of platform men, as above described, and the index was recalculated for the years 1923 and 1924. Up until October of this year, 103 companies were included, but at that time, additional companies were added, bringing the total number up to 144, so that the index now includes all companies in the United States which employ more than one hundred platform men each. The addition of 41 companies, all of which were small in the number of men employed, made practically no change in the index numbers as published for the preceding three years, and consequently no revision has been made in the index numbers as previously published on account of the additional data used.

The Index of Street Railway Fares, as here shown, is as computed by the writer, and includes all cities in the country with a population of 50,000 or more, except New York City. The index is weighted in accordance with the population of the various cities, and the fares used are, as nearly as it is possible to determine them, the average in the various cities, including cash and regular ticket or token fares. Ticket or token rates used are those available to all riders at all times of the day; pupils', workmen's or other special forms of tickets are not included. Pass and free transfer riders are not included in arriving at the averages, but where a charge is made for a transfer such charge and the proportion of original riders paying it are considered. The multiplying factor between the Richey Fare Index as here presented (on the base of 1913 = 100) and the average fare in cents is 0.048425. The average fare in cents may be found for any month by multiplying the index number as here shown by that factor, which represents the average fare in 1913.

#### TRENDS SHOWN BY THE INDEXES FOR 1925

In the articles corresponding to this which were printed in the Statistical Issues of the JOURNAL for 1924 and 1925, attention was called to the apparent stabilization of electric railway costs, as compared with the large and rapid fluctuations in labor and material costs which characterized the years during and immediately following the world war. This tendency is again borne out by the figures for 1925.

The Wholesale Commodity Index averages several points higher than in 1924, its fluctuations during the

year just passed having been between 155 and 161, while during the preceding year its average was 150.

The Electric Railway Construction Cost Index is still following the almost horizontal course started in the middle of 1923, although for the past seven months it has been 1 or 2 per cent lower than during the preceding two years. This is due primarily to a slight falling off in average rates paid for common labor, as there has been very little change in its other constituents.

The Index of Operating Materials Costs, which with some minor fluctuations followed a general downward trend from the middle of 1922 to the end of 1924, showed an increase during the first half of 1925, followed by a decline during the last half of the year, and an increase in December, so that at present it is  $3\frac{1}{2}$  per cent higher than a year ago.

The Index of Electric Railway Wages shows an increase during the year of 1 per cent, this being due principally to increases in Cleveland, Detroit, Philadelphia, Seattle, Minneapolis and St. Paul, and the Eastern Massachusetts Street Railway. With very few and minor exceptions, no other increases have been reported during the year, but there have been many renewals and extensions of existing rates. No decreases have been reported during the year. Wage increases have been granted, effective as of Jan. 1, 1926, in Buffalo and in Oakland; the effect of these changes will be to increase the index about 0.7 point or 0.3 per cent.

The Index of Street Railway Fares has increased slightly during the year. The weighted average fare was 7.24 cents at the beginning of the year. This rose to the peak in October, principally due to increases in Buffalo, Minneapolis, St. Paul, Omaha, South Bend, and the eastern Massachusetts cities. Since October, it has been slightly reduced by the reduction in fares in Cincinnati. The October index of 151.0, corresponding to an average fare of 7.31 cents, is the highest point which this index has reached. The previous peak was in October, 1921, when the index stood at 149.6, corresponding to an average fare of 7.24 cents. The increase in fares in Rochester, as of Jan. 1, 1926, will almost, if not quite, bring the index back to its peak of October, 1924.

Among other indexes regularly included in the monthly Conspectus but not charted or tabulated here, the General Construction Cost Index to the *Engineering News-Record* stands at 205.95 in December, a reduction of 2.63 points or  $1\frac{1}{4}$  per cent since December, 1924; the average for the year 1925 is 206.63, which is 8.67 points or 4 per cent under the average for 1924. Bradstreet's Index of Wholesale Commodities, which stood at 9.2115 as an average for 1913, is 14.4054 on Dec. 1, 1925; this is an increase of 0.8765 point or  $6\frac{1}{2}$  per cent since December, 1924; the average for 1925 is 13.9445, which is an increase of 1.0773 points or  $8\frac{1}{2}$  per cent over the average for 1924. The United States Bureau of Labor Statistics Index of Retail Food Costs is 167.1 for November, 1925, an increase of 17 points or 11 per cent over the index for November, 1924. The Cost of Living Index of the National Industrial Conference Board is 171 for November, 1925, an increase of six points or  $3\frac{1}{2}$  per cent since November, 1924.

Of the indexes relating to general business conditions, the unfilled steel orders of the United States Steel Corporation were slightly in excess of 400,000 and 500,000 tons on Nov. 30, last, as compared with about 4,000,000 tons a year before; throughout 1925 the



monthly reports of unfilled steel orders have exceeded the corresponding months of 1924 by amounts averaging 333,000 tons, or about 8½ per cent. The monthly reports of bank clearings outside of New York City also have consistently shown increases over 1924 throughout the year, while at least since March, the number of business failures as well as the liabilities have been less than during the same period in 1924. These indexes, as well as others relating to the state of general business, indicate slightly better conditions and more activity during 1925 than in 1924.

#### TREND OF OPERATING COSTS

In the résumé corresponding to this, which was printed in the Statistical Number of the JOURNAL a year ago, two of the Richey Indexes (operating material costs and wages) were combined to arrive at an indication of the trend of electric railway operating expenses. This was done under the assumption that a fair present distribution of operating expense is wages 62½ per cent, material 22½ per cent, and other expense 15 per cent. The "other" expense is that part of the operating expense which is neither wages nor material, such as salaries, general office expense, advertising, accidents, etc., and it was assumed that such "other" expense varies in the same ratio as wages and material combined. This combination also involves the assumption that all wages paid by the electric railways have varied the same as the wages of the platform men. With all of these assumptions, the 1925 change in average electric railway operating costs (exclusive of fixed charges) was as follows:

	Wages	Materials	Operating Expense
Index at end of 1924.....	220.8	148.7	201.7
Index at end of 1925.....	223.0	153.9	204.7
Increase during 1925, per cent	1.0	3.5	1.5

On this basis, then, which does not take into account such economies as those made possible by the one-man car, average electric railway operating expenses (not including fixed charges) in the United States at the end of 1924 were a little more than double those of 1913; during 1925 they increased 3 points, or 1½ per cent; and it may be noted that during the same periods the average street railway fares increased 50.7 per cent since 1913, and 0.74 per cent during 1925.

It should be borne very definitely in mind, in considering any of the figures shown or statements made in this article, that they are based on average conditions of the country as a whole, and that in specific locations or cities individual experience is quite likely to show different results. These country-wide trends, however, are of great value for comparison with individual experience.

### Annual Table of Statistics of the Industry

**I**N ADDITION to the statistics contained in this issue, ELECTRIC RAILWAY JOURNAL publishes annually a table of general statistics of the electric railway industry, based on the McGraw Electric Railway Directory. This directory is published annually in February, and statistics from the February, 1925, directory were published in the issue of this paper for March 7, 1925.

The editors of this paper are now compiling the statistics for this annual table from the reports being received for the February, 1926, McGraw directory and hope to publish the results in tabular form in some issue of this paper during January. This table will show,

as usual, by states, the number of operating electric railway companies, miles of track and number of passenger motor cars, passenger trail cars, electric locomotives, freight motor cars, freight trail cars, service cars and other types of cars owned by the electric railways in the United States.

### Damages to Electric Railways by Earthquakes

**E**LECTRIC railway cars destroyed by the earthquake of Sept. 1, 1923, in Japan, totaled 955, according to a paper presented at the International Conference of Large Transmission Systems, held in Paris in June of this year. Practically all of these cars were destroyed by the fire following the earthquake. The actual damage done by the quake itself to the electric railways was mostly to the track and roadbed. Sinking of the roadbed occurred over a wide area. Movement of the roadbed naturally caused a corresponding movement of the poles, with some damage to the feeders and trolley lines. There was also considerable damage to bridges and culverts, but tunnels did not suffer much damage. That suffered was mainly at the entrances.

Within the built-up city areas, such as in Tokyo and Yokohama, fire followed the earthquake, causing the losses of cars already mentioned. The chief sufferer was the municipality of Tokyo, which lost altogether 534 double-truck cars and 290 single-truck cars.

By Sept. 1, 1924, more than a year after the disaster, the miles of track and number of electric cars in operation had returned to the status of before the earthquake.

### Building a Bridge in a Day

**W**HEN the city of North Milwaukee decided to build a new bridge on 32d Street near Hampton Road it became necessary for the Milwaukee Electric Railway & Light Company to devise some way to keep the cars in operation over the creek while the new bridge was under construction. After considering several kinds of operation it was decided to construct a temporary bridge over the old bridge, allowing sufficient space in between the two structures so as not to interfere with the construction of the new bridge. During the night of Saturday, Sept. 12, sufficient material was delivered with which to construct this bridge, consisting mainly of piles, rails, 12-in. x 12-in. caps and ties.

On the morning of Monday, Sept. 14, actual work was started on the temporary bridge. Commencing at 8 o'clock the cars were stubbed on either side of the bridge, the trolley wire was shifted to one side and the pile driver was set up for the purpose of driving piles for the bents of the temporary structure, after which the old track, deck and old bridge were removed. By noon the piles for the three bents needed had been driven. The temporary track was supported on a deck, using eight 62-ft. 7-in. 102 T-rail, four being placed parallel and under each running rail of the bridge. About all that remained to be done was to place run-offs at each end of the bridge. These were made by using ties and timber, making an easy incline at each side. Temporary cross-over points were used to connect the temporary track with the permanent track. By 5:30 p.m. the trolley wire had been replaced and cars were operating over the new temporary bridge. —*Rail and Wire.*



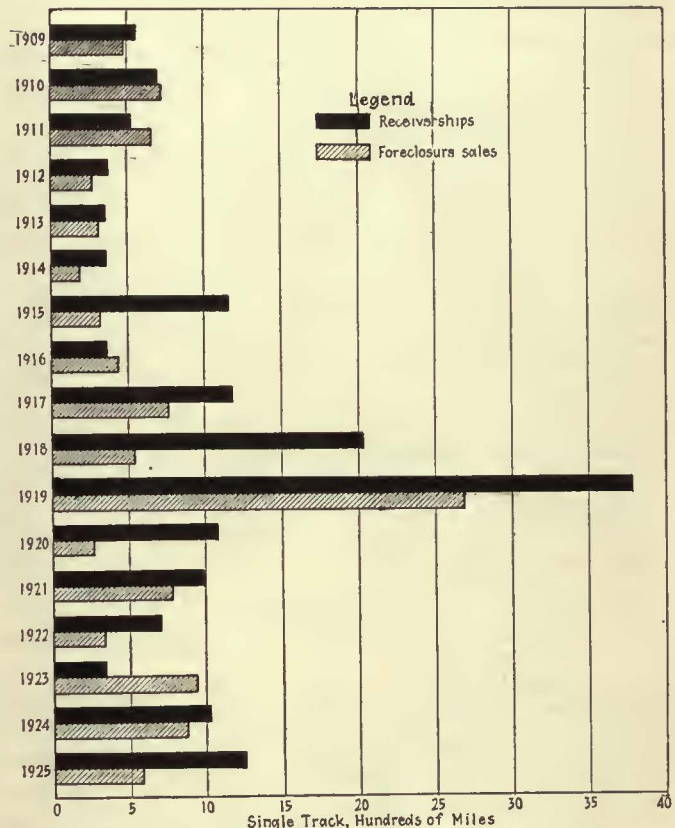
# Receiverships Reduced in 1925

Fewer Roads Were Thrown in Receivership During the Year, Although the Failure of One Large Property Increased the Mileage Over That in 1924—Many Roads Restored to Their Owners, While Others Are on the Way to Terminate Receiverships Early This Year

WITH the number of electric railways in receivership gradually decreasing and reorganizations and merging of properties not in receivership the favorable outlook for the industry increases. There has been much activity along these lines during the past year, along with the trend toward co-ordination and strengthening the existing roads. While the number of miles of track involved is now about 4,165, slightly more than last year, there are fewer companies involved. Four companies comprising some 68 miles of track have gone through foreclosure proceedings and are now in the process of reorganization, but the final steps have not been perfected. These are therefore included in the table as still being in receivership.

The most important reorganization the past year was that of the Denver Tramway with 226 miles of single track, which becomes the Denver Tramway Corporation.

Another important reorganization was that of the Chicago, Lake Shore and South Bend Railroad, a 71-mile



The Mileage of Electric Railways Going into Receiverships and Those Sold at Foreclosure Is Presented Graphically

interurban. A receiver for this road was appointed on Feb. 28, the foreclosure sale took place June 29, and by July 13 it had been reorganized as the Chicago, South Shore & South Bend Railroad and the receiver discharged.

The Cleveland, Alliance & Mahoning Valley Railway was sold at receiver's sale to the Northern Realty Company, a subsidiary of the Northern Ohio Traction & Light Company, and is now operating as an important link in the freight handling of the latter company.

Table I—Electric Railway Receiverships—1925

	Miles of Single Track Involved	Outstanding Securities		
		Stock	Bonds	Receivers' Certificates
Boston & Worcester Street Ry., Framingham, Mass.....	83.00	\$2,482,200	\$2,520,000	None
Laconia Street Ry., Laconia, N. H.	8.00	140,300	91,000	None
Cumberland & Westport Electric Ry., Frostburg, Md.....	25.00	625,000	655,000	None
Binghamton Railway, Binghamton, N. Y.....	49.52	978,895	2,812,825	None
Frankford, Tacony & Holmesburg Street Ry., Philadelphia, Pa.....	16.18	500,000	400,000	None
Chicago, Lake Shore & South Bend Ry., Michigan City, Ind. (1).....	70.86	6,000,000	4,692,000	None
Indianapolis & Cincinnati Traction Co., Indianapolis, Ind.....	101.00	3,600,000	2,400,000	\$112,000
Detroit United Ry., Detroit, Mich.	613.89	25,000,000	29,745,500	None
Wahpeton Breckenridge Street Ry., Breckenridge, Minn.....	1.00	42,500	None	None (2)
Tiffin & Fostoria Ry., Tiffin, Ohio..	15.00	(2)	(2)	(2)
Helena Light & Railway Co., Helena, Mont.....	18.50	935,000	878,000	None
Salt Lake & Utah Railroad, Salt Lake City, Utah.....	96.71	5,043,700	2,644,200	100,000
Oklahoma Railway, Oklahoma City, Okla. (3).....	138.40	5,595,900	5,815,000	None
Tulsa Street Railway, Tulsa, Okla..	23.00	580,000	771,000	None
<b>Total for 1925 (14 companies).....</b>	<b>1,260.06</b>	<b>\$51,523,195</b>	<b>\$54,484,525</b>	<b>\$212,000</b>

(1) Receiver appointed Feb. 28, 1925. Property sold at foreclosure sale and reorganized as Chicago, South Shore & South Bend Railway. Receiver discharged July 13.  
 (2) Information not available  
 (3) Receiver appointed late in December, 1924.

Table II—Record of Electric Railway Receiverships

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities		
			Stock	Bonds	Receivers' Certificates
1909	22	558.00	\$29,962,200	\$22,325,000	
1910	11	696.61	12,629,400	75,490,735	
1911	19	518.90	29,533,450	38,973,293	
1912	26	373.58	20,410,700	11,133,800	
1913	18	342.84	31,006,900	47,272,200	
1914	10	362.39	35,562,550	19,050,460	
1915	27	1,152.10	40,298,050	39,372,375	
1916	15	359.26	14,476,600	10,849,200	
1917	21	1,177.32	33,918,725	33,778,400	
1918	29	2,017.61	92,130,388	163,257,102	
1919	48	3,781.12	321,239,354	312,915,104	
1920	19	1,065.31	28,758,455	72,283,575	
1921	19	986.42	32,909,525	36,177,800	
1922	14	695.43	18,140,150	20,304,400	
1923	12	333.63	8,332,100	14,707,066	
1924	12	1,021.88	28,489,700	35,716,000	
1925	14	1,260.07	51,383,195	54,696,525	

(3) Receiver appointed late in December, 1924.

Table III—Record of Electric Railway Foreclosure Sales

Year	Number of Companies	Miles of Track Involved	Outstanding Securities			Receivers' Certificates
			Stocks	Bonds	Receivers' Certificates	
1909	21	488.00	\$22,265,700	\$21,174,000	(a)	
1910	22	724.36	19,106,613	26,374,075	(a)	
1911	25	660.72	91,354,800	115,092,750	(a)	
1912	18	267.18	14,197,300	10,685,250	(a)	
1913	17	302.28	15,243,700	19,094,500	(a)	
1914	11	181.26	26,239,700	44,094,241	(a)	
1915	19	308.31	30,508,817	16,759,997	(a)	
1916	19	430.14	13,895,400	22,702,300	(a)	
1917	26	745.19	27,281,900	27,313,045	(a)	
1918	23	524.22	37,740,325	20,149,384	(a)	
1919	29	2,675.48	89,893,400	79,836,738	\$42,300	
1920	13	259.90	7,782,400	11,227,328	52,000	
1921	13	777.97	33,642,255	30,863,526	5,000	
1922	13	322.88	7,491,500	12,640,600	114,683	
1923	15	927.45	118,077,959	110,638,250	12,265,000	
1924	14	869.25	21,022,800	34,845,535	3,440,388	
1925	13	569.39	18,074,300	18,329,555	53,000	

(a) Data not available.



Table IV—Electric Railway Receiverships as of Dec. 31, 1925

New England States CONNECTICUT	Year of Receiver-ship	Miles of Single Track	Outstanding Securities		Receivers' Certificates
			Capital Stock	Funded Debt	
Danbury & Bethel Street Ry., Danbury.....	1917	13.00	\$320,000	\$588,500	\$100,000
Hartford & Springfield Street Ry., Warehouse Point.....	1918	48.00	785,000	961,000	None
MASSACHUSETTS					
Boston & Worcester Street Ry., Framingham....	1925	83.00	2,482,200	2,520,000	None
Connecticut Valley Street Ry., Greenfield (1)....	1921	47.05	620,000	560,000	None
Milford, Attleboro & Woonsocket Street Ry., Springfield (2).....	1924	29.73	315,000	300,000	None
NEW HAMPSHIRE					
Laconia Street Ry., Laconia (3).....	1925	8.00	140,000	91,000	None
Portsmouth, Dover & York St. Ry., Portsmouth..	1917	12.00	.....	707,000	30,000
VERMONT					
Barre & Montpelier Traction & Power Co., Montpelier.....	1920	9.75	120,000	100,000	None
Net receiverships Dec. 31, 1925, 8 Cos.....		250.53	4,782,200	5,847,500	130,000
Eastern States					
DISTRICT OF COLUMBIA					
Washington-Virginia Ry.....	1923	40.00	2,378,300	5,614,000	None
MARYLAND					
Cumberland & Westernport Electric Ry., Frostburg.....	1925	25.00	625,000	655,000	None
NEW JERSEY					
North Jersey Rapid Transit Co., Hobokus.....	1912	18.00	800,000	800,000	None
Morris County Traction Co., Morristown.....	1923	68.98	300,000	4,179,000	None
NEW YORK					
Binghamton Ry., Binghamton.....	1925	49.52	978,895	2,812,825	None
Brooklyn Heights R.R., Brooklyn.....	1919	5.12	200,000	250,000	None
Buffalo & Lackawanna Traction Co., Buffalo....	1918	8.80	55,000	1,000,000	None
Hamburg Railway, Buffalo.....	1920	21.72	None	750,000	None
Hornell Traction Co., Hornell.....	1917	10.90	117,900	150,000	2,000
Long Island Electric Ry., Jackson Heights.....	1924	24.97	600,000	600,000	None
Ithaca Traction Corporation, Ithaca.....	1924	11.62	400,000	763,000	None
New York & Long Island Traction Co., Jackson Heights.....	1923	50.76	1,000,000	1,000,000	None
New York & Queens County Ry., Jackson Heights Manhattan & Queens Traction Corp., Long Island City.....	1923	43.65	3,235,000	1,500,000	None
Second Avenue R.R., New York.....	1917	21.66	20,000	25,946	None
Staten Island Midland Ry., New York.....	1908	26.35	1,862,000	5,720,000	3,140,000
Steinway Railway, New York.....	1920	28.68	1,000,000	1,000,000	3,000
Westchester Street R.R., New York.....	1922	31.11	None	1,500,000	None
Penn Yan & Lake Shore Ry., Penn Yan.....	1920	16.32	700,000	168,000	None
Ogdensburg Street Ry., Potsdam.....	1918	8.50	94,000	100,000	None
Ogdensburg Street Ry., Potsdam.....	1922	7.74	150,000	150,000	None
PENNSYLVANIA					
North Branch Transit Co., Bloomsburg.....	1915	30.00	500,000	532,500	45,000
Net receiverships Dec. 31, 1925, 21 Cos.....		549.40	15,016,095	29,270,271	3,190,000
Central States					
ILLINOIS					
Alton, Granite & St. Louis Traction Co., Alton....	1920	62.00	3,189,000	3,000,000	None
Chicago & Interurban Traction Co., Chicago.....	1922	50.00	1,000,000	1,816,000	None
Peoria Railway Terminal Co., Peoria (4).....	1922	25.28	1,000,000	2,444,000	None
INDIANA					
Union Traction Company of Indiana, Anderson..	1924	450.53	11,500,000	15,381,000	None
Ft. Wayne, Van Wert & Lima Traction Co., Ft. Wayne.....	1921	61.63	1,000,000	1,470,000	None
Indianapolis & Cincinnati Traction Co., Indianapolis.....	1925	101.00	3,600,000	2,400,000	112,000
KENTUCKY					
Owensboro City Railroad, Owensboro.....	1923	12.50	75,000	400,000	None
MICHIGAN					
Detroit United Ry., Detroit.....	1925	613.89	15,375,000	29,745,500	None
Grand Rapids, Holland & Chicago Ry., Jackson	1924	80.93	1,324,700	1,500,000	None
Houghton County Traction Co., Houghton.....	1921	32.15	957,200	660,000	None
Michigan Railroad, Jackson.....	1924	173.84	4,000,000	8,050,000	None
MINNESOTA					
Wahpeton-Breckenridge Street Ry. (7).....	1925	1.00	42,500	None	None
St. Paul Southern Electric Ry., Hastings.....	1918	17.54	658,225	425,400	None
Mesaba Railway Co., Virginia (5).....	1924	38.00	2,260,000	1,581,000	10,000
MISSOURI					
Kansas City, Lawrence & Topeka Electric Ry., Kansas City.....	1919	12.00	250,000	400,000	None
Kansas City Railway, Kansas City.....	1920	318.04	100,000	29,959,316	None
Missouri Electric Railroad, St. Louis.....	1919	20.97	1,000,000	700,000	None
United Railways Company of St. Louis.....	1919	463.18	41,296,000	50,690,000	4,200,000
OHIO					
Cincinnati, Lawrenceburg & Aurora Electric Street R.R., Cincinnati.....	1913	31.67	808,900	750,000	None
Dayton, Springfield & Xenia Southern Ry., Dayton.....	1923	27.97	500,000	422,400	None
Cincinnati & Dayton Traction Co., Hamilton....	1920	91.07	1,250,000	3,250,000	None
Hocking-Sunday Creek Trac. Co., Nelsonville (6)	1923	14.99	223,000	300,000	None
Indiana, Columbus & Eastern Traction Co., Springfield.....	1921	201.49	4,025,000	7,900,000	200,000
Tiffin & Fostoria Ry., Tiffin.....	1925	15.00	(8)	(8)	(8)
Dayton, Covington & Piqua Traction Co., West Milton.....	1922	34.00	1,150,000	550,000	18,000
Net receiverships Dec. 31, 1925, 25 Cos.....		2,950.67	96,584,525	163,794,616	4,540,000
Western States					
KANSAS					
Kansas City, Kaw Valley & Western Ry., Bonner Springs.....	1924	42.31	740,500	1,374,500	None
Joplin & Pittsburg Railway, Pittsburg.....	1924	94.52	7,000,000	3,078,500	None
MONTANA					
Helena Light & Railway Co., Helena.....	1925	18.50	935,000	878,000	None
OKLAHOMA					
Oklahoma Railway, Oklahoma City.....	1924	138.45	5,595,900	5,815,000	None
Tulsa Street Railway, Tulsa.....	1925	23.00	580,000	771,000	None
UTAH					
Salt Lake & Utah R.R., Salt Lake City.....	1925	96.71	5,043,700	2,644,200	100,000
Net receiverships Dec. 31, 1925, 6 Cos.....		413.49	19,895,100	15,561,200	100,000
Reconciliation for United States					
Net receiverships Dec. 31, 1925, 60 Cos.....		4,164.09	136,277,920	213,473,587	7,960,000

The passenger business on this road is small, but as a freight carrier it is of much importance in establishing through service.

The Columbus, Newark & Zanesville Traction Company, comprising 91 miles of track, was reorganized early in the year as the Southern Ohio Public Service Company.

Three small roads discontinued operation, receivers were discharged and the properties were dismantled. These were the Port Jervis Traction Company with a mileage of 4.78; the Alamance Railway, 8.40 miles, and the Charleston-Isle of Palms Traction Company, 9 miles; a total of 22 miles.

The New York Railways is shown as having terminated its receivership. This property was reorganized in 1924 and has been operated by the New York Railways Corporation for more than a year. Due to a technicality the receiver has not been formerly discharged by the court, but as the old company is no longer an operating company it has been shown as emerging from receivership.

A complete story of the rehabilitation of the Interstate Consolidated Street Railway, Attleboro, Mass., was published in the Aug. 29 issue of this paper, page 321. The Toledo & Western Railroad was purchased outright at foreclosure sale by the Toledo & Western Railway and is now being operated as an important part in the latter's transportation service. Only two railways in Florida were in receivership at the beginning of the year, The Jacksonville Traction Company and the Pensacola Electric Company. Both of these roads terminated their receiverships during the year and have been restored to their owners.

The mileage of roads going into receivership this year was greatly increased by the appointment of a receiver for the Detroit United Railway, about 614 miles of track being involved in this one. Operations of the property have been materially curtailed since the lines in Detroit were sold to the city some two years ago.

Two other roads of more than 100 miles went into receivership during the year. The Oklahoma Railway,

(1) Practically all the property has been liquidated but receiver not yet discharged.

(2) All the property has been sold and assets are being distributed. Receiver not yet discharged.

(3) Sold at foreclosure sale.

(4) Foreclosure sale advertised for Jan. 6, 1926.

(5) Receiver appointed March 7, 1924.

(6) Sold at foreclosure sale Dec. 4, 1925. Now under process of reorganization.

(7) Operations permanently abandoned.

(8) Information not available.



Table V—Receiverships Terminated and Foreclosure Sales During 1925

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Outstanding Securities			Receivers' Certificates	
		Stocks	Bonds			
Interstate Consolidated Street Ry., Attleboro, Mass. (1)...	25.97	\$275,000	None	None	None	Sold at foreclosure sale in 1925 and reorganized as Interstate Street Railway
Northern Massachusetts Street Ry., Greenfield, Mass.....	44.09	500,000	500,000	.....	.....	Property liquidated and receiver discharged Dec. 12
New York Railways, New York, N. Y.....	85.01	17,495,060	48,673,027	.....	None	
Port Jervis Traction Co., Port Jervis, N. Y.....	4.78	30,000	70,000	.....	None	Road has been dismantled.
Slate Belt Transit Co., Pen Argyl, Pa.....	18.00	180,000	180,000	.....	None	Reorganized and receiver discharged.
Fraokford, Tacony & Holmesburg St. Ry., Philadelphia, Pa.	16.18	500,000	400,000	.....	None	Purchased and operated by the Philadelphia Rapid Transit Company.
Beech Grove Traction Co., Indianapolis, Ind.....	3.90	150,000	100,000	.....	None	Property sold at receiver's sale and reorganized as Beech Grove Traction Corporation.
Chicago, Lake Shore & South Bend R.R., Michigan City, Ind.	70.86	6,000,000	4,692,000	.....	None	Sold at foreclosure sale and reorganized as Chicago, South Shore & South Bend R.R.
Maumee Valley Ry., Perrysburg, Ohio.....	23.21	1,000,000	800,000	.....	None	Receiver discharged
Ohio River Electric Railway & Power Co., Pomeroy, Ohio...	13.79	300,000	315,000	.....	None	Property sold and reorganized as Ohio River Railway & Power Co.
Cleveland, Alliance & Mahoning Valley R.R., Ravenna, Ohio, 1920.....	46.00	1,100,000	1,100,000	8,000	.....	Purchased at receivers' sale by Northern Realty Co., a subsidiary of Northern Ohio Traction & Light Co., and operating as freight interurban.
Toledo & Western R.R., Toledo, Ohio.....	89.00	2,000,000	2,000,000	.....	None	Purchased by the Toledo & Western Railway at foreclosure sale.
Columbus, Newark & Zanesville Traction Co., Springfield, O.	91.05	2,025,000	4,704,000	190,000	.....	Reorganized as the Southern Ohio Public Service Co.
Jacksonville Traction Co., Jacksonville, Fla.....	60.00	1,500,000	3,267,000	128,791	.....	Receiver discharged.
Pensacola Electric Co., Pensacola, Fla.....	24.49	1,100,000	1,721,770	.....	None	Purchased by Southeastern Power & Light Co. Receiver discharged Feb. 10.
Valdosta Street Ry., Valdosta, Ga.....	5.00	50,000	1,500	\$383	.....	Receiver discharged
Alamance Railway, Burlington, N. C.....	8.40	60,000	120	.....	None	Road has been dismantled.
Charleston-Isle of Palms Traction Co., Charleston, S. C....	9.00	527,000	250,000	.....	None	Company liquidated and operations ceased.
Denver Tramway Co., Denver, Colo.....	226.14	6,156,300	17,351,710	.....	None	Receiver discharged and reorganized as Denver Tramway Corporation.
<b>Total of receiverships terminated (19 companies).....</b>	<b>864.87</b>	<b>\$40,948,360</b>	<b>\$86,126,127</b>	<b>\$319,174</b>		
<b>Foreclosures but Receivers Not Yet Discharged</b>						
Laconia St. Ry., Laconia, N. H.....	8.00	\$140,000	\$91,000	.....	None	
North Branch Transit Co., Bloomsburg, Pa.....	30.00	500,000	532,500	\$45,000	.....	
Hocking-Sunday Creek Traction Co., Nelsonville, Ohio....	14.99	223,000	300,000	.....	None	Foreclosure sale Dec. 4. Now being reorganized as Nelsonville-Athens Electric Ry.
Tiffin & Fostoria Ry., Tiffin, Ohio.....	15.00	.....	.....	.....	.....	Information not available.
<b>Total of foreclosure sales without receivers' discharge (4 companies).....</b>	<b>67.99</b>	<b>\$863,000</b>	<b>\$923,500</b>	<b>\$45,000</b>		
<b>Foreclosures Without Receiverships in 1924</b>						
Phoenixville-Valley Forge & Strafford Electric Ry., Phoenixville, Pa.....	5.50	.....	.....	.....	.....	Information not available.
Mt. Manitou Park & Incline Ry., Colorado Springs, Colo.	1.25	130,000	125,575	.....	None	
Gainesville Ry., Gainesville, Ga.....	10.00	.....	.....	.....	.....	Service abandoned.

138.4 miles, and the Indianapolis & Cincinnati Traction Company, 101 miles. Next to these in importance are the Salt Lake & Utah Railroad, the Boston & Worcester Street Railway and the Chicago, Lake Shore & South Bend Railway, mentioned in a foregoing paragraph.

Next to the Detroit United Railway the largest properties remaining in receivership at the close of last year are the United Railways of St. Louis, with a total of 460.93 miles, and the Kansas City Railways, with 314.88 miles. Both of these companies are now in the process of reorganization. It was planned to sell the Kansas City property at foreclosure on Dec. 15 but it has been found necessary to postpone the sale until early this month. The reorganization plan has been approved by a large majority of the security holders and is acceptable to the court. The St. Louis company will undoubtedly perfect its reorganization plans and emerge from receivership during this year.

### Super-Highway Plan Progressing in Detroit

POPULAR attention was vividly attracted to a suggestion made by the Detroit Rapid Transit Commission, a little more than a year ago for the construction of a system of super-highways, each 212 ft. wide and extending from Detroit radially in a number of directions. The plan was described on page 52 of the issue of this paper for July 12, 1924. Recently two more reports bearing on this subject, but relating more particularly to means for expediting traffic downtown, have been presented to the city authorities. One of these was an analysis of traffic conditions on a number of Detroit business streets made by the Rapid Transit

Commission. The other was a report entitled "Carrying Out the Master Plan" by an advisory committee, made up of the corporation counsel, the prosecuting attorney of Wayne County, the Board of County Auditors, the City Plan Commission and the Rapid Transit Commission.

The former report summarizes the traffic conditions of the Grand Boulevard and streets leading to it on June 19, 1925, for a period of twelve hours from 7 a.m. to 7 p.m. The Grand Boulevard belts the city at a distance of about 3 miles from the center and is 11 miles long. Everywhere it is 150 ft. wide and in some places 200 ft. wide, and the Rapid Transit Commission says that it is an example of far-visioned city planning that may well serve as an inspiration to those responsible for the present planning of the city of the future. It has now come to be one of the most used traffic arteries of the city, articulating as it does with all the radial avenues which are characteristic of the city plan of Detroit.

It is found that at times the movement of traffic on the Boulevard amounts to 679 vehicles per traffic lane. This number is near the point of saturation, which is believed to be 800 vehicles per traffic lane under the present "Stop and Go" regulations. To improve conditions, the commission recommends the widening of a number of streets and opening of others, the most important being the development of Vernor Highway to be 150 ft. wide at points and 120 ft. wide at other points, extending north and south through the city, at a cost of \$5,279,000.

The report of the advisory committee approved this plan and discussed the legislation necessary and the cost for this and other proposed improvements.



# The News of the Industry

## Seven-Cent Ticket Rate in Spokane

Application for a 10-cent cash and a 7-cent ticket fare to become effective on Feb. 1, 1926, was filed by the Spokane United Railways, Spokane, Wash., on Dec. 28. Unless a protest is made the fare will become effective automatically. The company had petitioned for a 10-cent cash fare, with a ticket rate of thirteen for \$1 or 7.69 cents each. Under the new tariff filed five tickets would be sold for 35 cents. State officials indicated that the Spokane United Railways management and the City Council of Spokane had reached an agreement on this rate.

Formal notice was filed on Oct. 16 with the Mayor and the City Commissioners of Spokane to the effect that the Spokane United Railways intended filing a schedule for increased rates with the Department of Public Works of the State of Washington calling for a 10-cent cash fare, a 7.69-cent ticket rate and with school tickets remaining at 4 cents. Stern opposition to the proposed increase was voiced by Charles A. Fleming, Mayor and Commissioner of Public Utilities of the city, in his report to the City Council on Nov. 5. The present rate is 7 cents cash with a 6-cent ticket rate.

## Ordinance Looks Toward Cleveland Subway

Petitions for an initiated ordinance, to float a \$30,000,000 bond issue for subways in Cleveland, are in circulation. The movement was started by Councilman Peter Witt, formerly city street railway commissioner. Five thousand signatures are needed to put the ordinance before the City Council. The petition calls for three lines, one across Superior Avenue from the easterly limits of the city, via the high level bridge and Clifton Avenue on the west side; a second running westerly from Cedar Avenue and East Boulevard, on the east side, to University Circle, west on Euclid to Huron Road and over the proposed Huron-Lorain bridge to West 35th Street, and a third northerly from East 93d Street and Miles Avenue, to Buckeye Road and northwesterly to Woodland Avenue and to the Public Square. Mr. Witt's idea is to pay off the bonds in 25 years and to have them bear 6 per cent interest.

## Mayor Signs \$1,200,000 Offer for Rainier Line

Mayor Edwin J. Brown recently signed the ordinance passed by the City Council of Seattle, Wash., binding itself to an offer of \$1,200,000 for the lines of the Seattle & Rainier Valley Railway. Immediately a referendum move was started to put the deal to a vote of

the citizens of Seattle. Petitions for such a referendum have been circulated by those residents of Rainier Valley who oppose the purchase. As a counter-move, residents of the valley who favor the purchase, and who claim to be 98 per cent of the residents, issued post-cards to all Seattle voters urging against the referendum and requesting voters not to sign the petition.

The card points out that "purchase will give the city monopoly of street railway transportation, assuring valley residents equal rights and privileges with the rest of the city." The campaign for referendum is headed by E. F. Blaine, former chairman of the State Public Service Commission, aided by E. F. Markham, president of the Rainier Valley Commercial Club.

## Pay of Connecticut Men Unchanged

Arbitrators Continue Base Rate at 60 Cents, but Increase Bus Men  
3 Cents—Shop Men Benefited—Minority Report to Be Filed  
—Company Sought Reduction

THERE will be no increase in pay for trainmen of the Connecticut Company, New Haven, but 3 cents additional an hour has been awarded to bus operators. This establishes a differential of 10 cents an hour for bus operators over the basic rate of 60 cents an hour, instead of the present 7-cent differential. It represents the finding of the board of arbitration, concurred in by the neutral arbitrator and the arbitrator for the company. The member of the board chosen by the men dissented. The finding was made public on Dec. 22.

The request of the men that the right of seniority be extended to include the operation of buses was denied by the board on the grounds that "it would result in great injustice to the present motor bus operators if their right to maintain their present jobs should be taken away . . ." and further that "the offer of the company to extend the right of seniority to the trolley operators in all cases where any vacancy hereafter occurs in existing bus lines and to all new buses hereafter put in operation, is an eminently just and fair one and is hereby sustained."

### OTHER SLIGHT CHANGES

The award of the board effected another slight change in wages, concerning only about twenty men, in that it established that all shop and power station employes, some of whom are now receiving less pay than others for the same work, should be paid an equal wage and that this should be the highest rate now paid by the company in these various lines.

An unusual feature of the award is that the bus operators, receiving the only wage increase, made no demand for a rate of pay higher than the one-man trolley operators. About 100 bus operators are affected by the increase and with the retroactive provision they will receive approximately \$50 each in back pay.

As set forth in the award the present rates of pay to trolley men are as follows: 53 cents an hour for the first

three months of employment; 56 cents an hour for the next nine months, and thereafter 60 cents an hour as the general basic rate, plus a differential rate of 7 cents an hour for operators of one-man cars and buses.

The demands of the men were that these rates be increased to 70 cents in the first instance; to 72 cents in the second and 75 cents in the third, the basic rate. They demanded that the differential rate for one-man car and bus operators be made 15 cents above the basic rate.

The Connecticut Company sought to reduce the wage scale to 47 cents in the first instance, to 51 in the second and to 55 in the third or basic rate. The company asked for a reduction of the differential rate to 5 cents above the basic rate.

In reviewing the claims of each side the arbitration board found that the men claimed there had been a shortage or "lag" in pay over a period of twelve years and that the rate should be increased so this amount would be made up over the same period of time. The Connecticut Company claimed there should be a reduction in the future because of the "excess" of actual earnings now over the cost of living during the same period.

The board held that neither claim was valid because of arbitration agreements covering the years from 1921 to 1925, which precluded bringing up such questions again, the legal theory of arbitration being that the disposition of its subject matter is final.

The decision was written by Charles Kleiner of New Haven, neutral member and chairman of the arbitration board which included Joseph F. Berry, Hartford, representing the Connecticut Company, and James H. Vahey, Boston, representing the union. Mr. Berry added his signature to the finding which was signed by Mr. Kleiner, and the award with its requirement of two signatures becomes final.

Mr. Vahey did not sign the finding. It is expected that he will file a minority decision.



### "We Are"—"Will You" Slogan in Allentown

The Lehigh Valley Transit Company, Allentown, Pa., is conducting an intensive safety campaign through its general safety committee. The members of the committee are visiting personally all owners and operators of trucks in the territory of 218 miles of track traversed by the company and are talking to people on the street corners and in the cars. The members of the committee are designated by an arm band with large green letters, "General Safety Committee L. V. T. Co." Talks have been given before all the luncheon, civic and woman's clubs in the entire district. Newspaper articles have appeared periodically. Mass meetings of the men have been held, with addresses by the mayors and other officials of the various cities.

At the mass meeting of the men held on Dec. 18 in the assembly hall of the company four prizes were awarded for the best safety suggestions brought in by the men. One of the prizes was awarded for a slogan which will be adopted by the company and used on the cars of the company after the first of the year. The slogan is as follows:

WE ARE  
WILL YOU

ASK THE  
MOTORMAN OR CONDUCTOR

All employees will wear buttons with this slogan on it, "the object being, we are working to safeguard the highways, will you co-operate with us?" Another prize was awarded for a poem entitled "The Head-Gear." This was composed by one of the conductors. This poem is appearing in the newspapers over the entire system of the company.

The drive has been one of the most successful and the most interesting that has ever been conducted by the company. It is under the direct supervision of H. F. Dicke, vice-president and general manager, and E. C. Spring, general superintendent.

### Key System Passengers Questioned About Riding Habits

In an effort to solve two transportation problems affecting the East Bay cities of California the State Railroad Commission has drawn up a questionnaire for passengers traveling to and from Oakland and San Francisco on ferryboats of the Key System Transit Company and the Southern Pacific Company.

It is hoped that the answers to this questionnaire will shed light on the contention of the Key company officials, who are seeking increased ferry and car fares, that the fares now being collected are too low for the average trip mileage and that they also will answer the question as to whether the Key company is over supplied with ferryboats.

Four questions are being put to ferry passengers:

1. Is this a single trip or are you traveling upon commute or free ticket?
2. At which street or station do you leave the train?
3. After leaving the train what is your immediate destination and that is near the intersection of what street?

4. If you use a street car to complete your trip, what is the number or letter of the route used?

Since the Key company ordered two new ferryboats built recently the contention has been raised that the company does not need them, that it already has too many boats and that it maintains an uneconomical service throughout the day, with the result reflected in the net revenues and a demand for higher ferry fares.

To this Key company officials have replied that some of their old boats now in service cost so much to maintain that it has been deemed an economy to buy new ones to replace them.

### Making the Punishment Fit the Crime

Drivers of motor vehicles in Buffalo, N. Y., who approach within 7 ft. of a standing street car are being arrested for violation of the traffic ordinances as the result of a campaign started by the Buffalo *Courier*, a newspaper, with the co-operation of the police department and the International Railway. The railway reproduced a cartoon published in the *Courier* showing the 7-ft. safety zone around standing street cars and these were displayed on cards attached to the front and rear ends of every street car in the city. Fines have been imposed upon several hundred motorists in this campaign, with the result that accidents resulting from drivers injuring passengers boarding and alighting have been materially reduced.

### COMING MEETINGS

OR

### Electric Railway and Allied Associations

Jan. 6—American Society of Civil Engineers, Engineering Societies Building, 29 West 39th Street, New York, N. Y.

Jan. 8—Metropolitan Section A. E. R. A., Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.; Informal dinner, Keen's Chop House, 72 West 36th Street, 6:15 p.m.

Jan. 14-15—Kentucky Association of Public Utilities, Annual Meeting, Brown Hotel, Louisville, Ky.

Jan. 20-21—Central Electric Traffic Association, Miami Hotel, Dayton, Ohio.

Jan. 22-23—Central Electric Railway Accountants' Association, Miami Hotel, Dayton, Ohio.

Jan. 26-29—Society of Automotive Engineers, Annual Meeting, Detroit, Mich.

Jan. 27—New York Electric Railway Association, Hotel Commodore, New York, N. Y.

Jan. 28-29—Central Electric Railway Association, Lincoln Hotel, Indianapolis, Ind.

Feb. 11—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.

April 13-16—Southwestern Public Service Association, Galveston, Tex.

### \$12,000,000 Electrification for Long Island

Vice-President Le Boutillier of the Long Island Railroad on Dec. 24 laid plans before Chief Engineer Randolph Nixon of the Public Service Commission for further electrification of the Long Island from 1926 to 1929 at a cost of \$12,600,000.

The improvements follow:

In 1926, electrification of the Bay Ridge Division and the Bay Ridge yards, \$4,040,000.

In 1927, electrification of the Montauk Division, from Long Island City to Hoiban yards and the yards at Long Island City, Blissville, Fresh Pond and Holban, \$6,010,000.

In 1928, electrification of freight sidings on the North Side Division, the main line between Long Island City and Jamaica and on the Atlantic Division, \$1,205,000.

In 1929, electrification of the remainder of freight sidings in territory now electrified for passenger service, \$595,000.

With the exception of \$710,000 in 1926 for seven electric locomotives for electrification of the Floral Park-Mineola extension from Hempstead Crossing to Valley Stream, Mr. Le Boutillier said the proposed expenditures have to do with freight lines only.

### Wage Increase on Illinois Traction

A flat wage increase of 5 cents an hour, an increase of  $\frac{1}{2}$  cent in the mileage rate and 50 per cent increase in overtime with the provision that the present closed shop be maintained, are the terms of the new agreement between the Illinois Traction System and its trainmen. Under the new schedule the pay of motormen, conductors and brakemen will be from 55 to 70 cents an hour. The old agreement expired on Nov. 30, but the men continued at work pending an adjustment. Their contract provides that there shall be no interruption of service while negotiations on a new contract are under way. It is understood that the wage settlement applies only to the main line of the Illinois Traction System, which is exclusive of what is known as the Illinois Valley Division, which runs from Ottawa west.

### On the Air with P.R.T.

After the Philadelphia captain of industry, his day at the office finished, has donned the old carpet slippers and stoked up the favorite pipe he can now tune in on station WLIT and hear the versatile artists of the Philadelphia Rapid Transit Company in action. Even to these lengths have the efforts toward building up a lasting spirit of public good will gone.

With the installation of a radio control room at its carhouse at Tenth and Luzerne Streets the P. R. T. made its opening bow to the radio public on Dec. 2. An unusually well-rounded program was given, over a period of two hours, by the P. R. T. Brass Band of 110 pieces, one of the largest industrial bands in the country; the P. R. T. String Club, of 25 instruments; the Tempert Serenaders, a twelve-piece jazz orchestra which has made quite a name for itself in playing for various dances of the employees, and a mixed quartet. It is planned to continue the concerts on alternate Wednesday evenings.



## Construction Work in Buffalo Ordered

The Public Service Commission under an order issued on Dec. 28 directs the International Railway, Buffalo, N. Y., as follows:

On or before July 1, 1926, to complete reconstruction of its tracks in Grant Street.  
On or before Sept. 1, 1926, to complete reconstruction of its tracks in Walden Avenue from the east side of Genesee Street to the New York Central Railroad undercrossing.

On or before Nov. 1, 1926, to complete reconstruction of its tracks in Walden Avenue from the Erie Railroad undercrossing to the Delaware, Lackawanna & Western Railroad undercrossing.

The city, under a complaint filed, asked for an order to compel the railway to reconstruct the pavement in Main Street from Hertel Avenue to the city line and in Walden Avenue and Grant Street, it having entered into contracts for repavements, and had notified the railway to repave between and for 2 ft. outside its tracks. Commissioner Pooley, the sitting commissioner, in a memorandum approved by the commission, says the commission is not concerned with the question of repavement, that being governed by law requiring the railway to keep in permanent repair that part of the street occupied by it, and in case of neglect by the company the city can do the work at the expense of the company.

The commission says:

We are concerned, however, with regard to the manner in which street car lines are conducted and operated and with respect to adequacy, security and accommodations afforded by their service, and the scope of this investigation has been confined to a consideration of the safety of the tracks in question with respect to transportation of passengers.

## Last Staten Island Line Electrified

The Staten Island Rapid Transit Company completed on Dec. 24 the electrification of its passenger train service. On Dec. 25 it operated its first electric train over the north shore division from St. George to Arlington.

Operations over the electrified system were initiated by General Superintendent M. L. McElheny. Officials of the company made the first trip. The new electric trains will reduce by four minutes the running time over the north shore division. The only steam locomotives still in operation by the company will be used to haul freight.

## \$98,000 Asked for Preparatory Work for Pittsburgh Subway

The recently created Department of Rapid Transit of Pittsburgh, Pa., has requested the City Council for twenty new positions with salaries totaling \$60,884 annually. Besides, the department has asked for \$13,116 for general expenses and special services and \$24,000 for consulting engineer's fees and expenses. The appropriation request for next year aggregated \$98,000. The Rapid Transit Department was created to supervise all city-owned transportation facilities, particularly the proposed \$6,000,000 subway. Officials of the department, appointed last September, all serve without pay. A letter which accompanied the request for the appropriation said the estimates were based

on the assumption that the Council, as a result of recommendations of the Traffic Commission, would take action soon to authorize subway construction.

## Increase in Fare Asked in Shreveport

A petition for a change in rates for Shreveport, La., has been filed with the Louisiana Public Service Commission by the Shreveport Railways. The petition is an amendment to an original petition asking an 8-cent fare with a 4-cent fare for children.

The new rate asked is a straight fare of 7 cents for adults and 3½ cents for school children. The present rate is 7 cents cash fare, four tickets for 25 cents or seventeen for \$1. School children pay a 2½-cent fare.

Capt. H. B. Hearn, president of the Shreveport Railways, announced that the company plans to increase service and to make other improvements.

## Receiver Confident St. Louis Will Be Just

Rolla Wells, receiver for the United Railways, St. Louis, Mo., in a series of addresses to the employees in recent weeks, has expressed the belief that the public of the city will receive favorably an application from the company for a new franchise with a rate of fare sufficiently high to compensate capital for investing in the railway.

He has pointed out that the reorganization plan is fair to the public and that the public in turn should be fair to the investors in the railway's securities. In this connection he pointed out that the stockholders of the United Railways have not had a dividend in years and that it is manifestly unfair to ask the man who by his investment provides railway facilities to serve the public without pay.

In conclusion he expressed the belief that the changed attitude on the part of patrons, press and city officials toward the United Railways will result in the enactment of a franchise which will make possible the best railway service St. Louis has had in years.

## News Notes

**Traction Employee to Be Tried.**—The trial of Harry H. Hershey, charged with embezzlement of \$41,000 from three utility companies of Lancaster, Pa., will be held in the January term of court. Mr. Hershey was an employee of the accounting department of the Conestoga Traction Company.

**Affirms Old Order.**—The Public Service Commission on Dec. 28 affirmed its order made in January, 1925, in the matter of the operation of one-man cars by the International Railway in Buffalo. The order which dismissed the complaint of the city of Buffalo against the use of one-man cars and suggested supplemental rules for safety was reviewed in the *ELECTRIC RAILWAY JOURNAL* of Jan. 17, page 116.

**Christmas Bonus Awarded at Nashville.**—The management of the Nashville Railway & Light Company, Nashville, Tenn., played Santa Claus to its employees recently by distributing \$3,240 in bonuses to men who have led the field in safe operation during the past three months. This amount made the year's total given to operating employees \$11,222. Sharing this gift were 119 motormen and operators who had operated three months without an accident. They had attended every safety meeting held by the company. With them were 107 conductors.

**Fares Advanced at Joplin.**—The City Commission of Joplin, Mo., on Dec. 22 adopted a resolution to grant the Joplin & Pittsburg Railway an increase in street car and bus fares from 5 to 7½ cents. The new rate will be in effect during a trial period of six months, starting on Jan. 1. The proposal for increased fares was made by a committee of the Chamber of Commerce after it had studied the local transportation problems.

**Fare Lowered.**—The Public Utilities Commission of the District of Columbia has authorized the Capital Traction Company, Washington, D. C., to reduce the rate of fare on its Chevy Chase Loop bus line to 5 cents, with twenty tickets to be sold for \$1. No transfer privileges will be extended to the users of this ticket.

**Short Time Grant Sought.**—Negotiations looking toward a short-time franchise for the Canton-Akron interurban line of the Northern Ohio Traction & Light Company have been started by A. C. Blinn, general manager. He asked the county for permission to operate without a franchise until 1927. The commissioners refused the request and declared they would give the company until Jan. 11 to obtain consent of a majority of the property owners for a renewal of the franchise. Mr. Blinn agreed to accept a new franchise if it specifically stated operation could be abandoned any time at the discretion of the management.

**Wages Advanced Five Cents.**—Employees of the Jacksonville Traction Company, Jacksonville, Fla., have received a pay increase of 5 cents an hour effective on Jan. 1. This increase is in addition to the 3 cents an hour granted in September. J. P. Ingle, general manager of the company, in announcing the boost said that the total of 8 cents over the 1925 scale would amount to \$70,000 during 1926. Mr. Ingle said the increase was decided on as the result of the increased living costs in Florida. It will result in the average trainman of the company receiving approximately \$165 per month.

**Polite System Introduced.**—The Arkansas Central Power Company, Little Rock, Ark., has put its employees under the polite code, with a card bearing the car operator's name placed above the motorman's station. Superintendent Koonce is responsible for this innovation. He says banks and business houses find it a good way to establish better relations between their employees and the public. He believes that the men like the plan and show a pride in the representation given them.



## Recent Bus Developments

### Buses Authorized in Columbia

The dawn of the new year in Columbia, S. C., will see in operation a fleet of ten 29-passenger White buses of the "pay-as-you-enter" city type, a certificate for operation having been granted the Carolina Transit Company of Columbia, S. C., by Samuel McGowan, chief highway commissioner.

Ten buses will operate over five routes and will provide transportation facilities to sections of Columbia not now served by the street car system of the Columbia Railway, Gas & Electric Company. Suburbs will also be served and one town, New Brookland, across the Congaree River from Columbia. Ten-cent fares will be charged with 5-cent fares for school children and three tickets or tokens will be sold for 25 cents.

The granting of the certificate to operate came after negotiations which had been somewhat protracted. The transportation situation in Columbia has been much in the public eye in recent months, three factors being involved, the 10-cent jitneys, the street cars and the bus lines. The various stages in the controversy have been referred to in these pages.

After holding the application for the permit in abeyance for some time, during which efforts were made to find out what the people of the city wanted, the highway commissioner granted the petition for a certificate to operate. A number of communications were directed to the commissioner, practically all of these favoring the operation of the buses, and so the application was granted. In the meanwhile, the 10-cent jitneys continue their operations, though the City Council at a recent meeting passed an ordinance which gives it power of regulating the jitneys to operate on certain streets, should it deem such action advisable. The jitneys at present run anywhere they like, carry only white passengers and charge 10-cent fares.

### Buses in Newton

Buses will take the place of railway cars in the town of Newton, Mass., and in those adjacent towns that are served by the Middlesex & Boston Street Railway. In a recent all-night special session the Newton Board of Aldermen granted the company an exclusive franchise for the operation of buses. Within 60 days the cross-town and Bemis lines of trolleys are to be replaced by buses. The cross-town cars run from Newton to Waltham and the Bemis line runs between Newton and Waltham.

Another line from Lake Street to Newton Highlands, via Newton Center, and to Watertown and Needham, will be motorized by Oct. 26, 1926, or by January, 1927, at the latest. Extra service is to be required of the company as soon as these three lines are provided with buses. The company asked for a subsidy of \$10,000 from the town,

but this subsidy was refused by the Aldermen. Only two lines of street cars will be left when the new buses are in operation.

### Bus Lines in Jamestown to Suspend

Notice that it intends to discontinue bus service on all lines in Jamestown, N. Y., in the near future was served upon the City Council on Dec. 22 by the Jamestown Motor Bus Transportation Company. There was no open session discussion of the proposal to abandon the bus lines by the Council, but that body voted to have a special committee of five men make a general survey of the bus situation, as well as the proposal of the Chautauqua Traction Company to abandon its line between Ashville and Mayville and of the Lake Erie Motor Coach Lines' request for permission to operate buses between Jamestown and Buffalo.

The owners concluded:

1. That even without considering anything for depreciation, the expense of operating the Jamestown Motor Bus Corporation is greater than its revenue. In other words, the buses have not paid the actual cash outlay necessary from day to day to keep them going.

2. That during approximately four years of operation the entire investment of \$50,000 in buses has been wiped out by depreciation and the company has been unable to earn any reserve to make the depreciation good.

W. A. Broadhead of the railway said:

We are faced with this problem, shall we now put into the company enough additional capital (at least \$30,000) to purchase six new buses? Not only is there no prospect that we would earn any return on the money so invested, but it appears that the entire investment would be wiped out by the rapid depreciation against which no reserve could be earned.

The deficit incurred in the last sixteen months is \$12,738. It would be nothing short of fool-hardy to make a new investment in this kind of business.

The officers of this company are not unappreciative of the importance of this transportation in the development of the city. These conclusions are reached with regret but they are cold facts which face us when the demand for more money for new equipment is made.

At a time in the near future when use of the present equipment becomes impracticable this company will be obliged to discontinue its operations. That date we have not fixed yet but it will not be long deferred.

Pending the fixing of such date we will be glad to have you examine the auditors' statements in detail and give the transportation problem your careful consideration, and we will be glad to furnish you any information which will be of service to you.

Some four years ago the Jamestown Motor Bus Corporation engaged in the operation of a bus service under a franchise from the city of Jamestown. The decision to stop operation is understood to have been based on an examination made by the administrators of the estates of Sheldon B. Broadhead and Almet N. Broadhead, who had financed the operation. The Broadheads control both the Jamestown Street Railway and the Chautauqua Traction Company.

### Service at Cost Suggested for Washington Buses

F. W. Doolittle, vice-president of the North American Company, which has taken over the routes of the Washington Rapid Transit Company, operating buses in Washington, D. C., wants rates fixed to provide a limited return on a fixed valuation, with the surplus devoted to extending bus facilities. Mr. Doolittle wants the bus properties valued by the Public Utilities Commission and a reasonable return on that valuation allowed in the fixing of fares. The return in the case of other public utilities in the District is 7½ per cent. Over and above this Mr. Doolittle would put the profits into cutting fares and improving service. Mr. Doolittle said:

The company's Sixteenth Street line is paying well. This should not be taken as an indication of the profitableness of bus operation under existing rates of fare, as adequate service to the community will require transportation routes upon which the same density of business cannot be expected to develop.

It is intended to apply to the commission to prescribe a service-at-cost procedure, by which the returns the company will be permitted to earn will be definitely understood, this plan to provide that excess earnings be utilized for extensions of service or reductions in fares.

Alexander Shapiro of the Milwaukee Electric Railway & Light Company, controlled by the North American Company, has been sent to Washington to study the present bus system.

### Oklahoma City Bus Lines Create New Business

The bus lines recently established by the Oklahoma Railway, in Oklahoma City, to supplement street car service are actually creating new business for the company. The North Hudson and Walker bus line established several weeks ago is already making money for the company. A new line, to be known as the Blackwelder line, has been established to run from the terminal and down-town shopping district northwesterly to and beyond the Oklahoma City University. The receipts on this line are encouraging. According to the receivers many automobile owners who have not heretofore patronized the street cars are riding these buses because by so doing they eliminate parking problems and are carried direct to the retail center of the city at less cost.

### Bus Company in Napa Formed

Articles of incorporation of the Napa Valley Bus Company, a subsidiary of the San Francisco, Napa & Calistoga Railway, Napa, Cal., were filed recently and the new company has applied to the State Railroad Commission for a permit to operate an auto stage line through the Napa Valley between Vallejo and Calistoga.

It will be necessary for the electric railway to take off some of its trains in the near future owing to a decrease in traffic, it is stated, and it is the intention of the railroad to fill any such vacancies in its schedule with the motor stages. The buses will be used for passenger service only, and the passengers' baggage, which may be checked on their ticket, will follow later on an electric train.



**Bus Service Enlarged.**—The New York, New Haven & Hartford Railroad has been given authority by the Public Utilities Department of Massachusetts to operate a bus line between the towns of South Braintree and North Easton, the route passing through Braintree, Randolph, Stoughton, Easton and into North Easton. At the same time the company was authorized to operate buses from North Easton to Canton, passing through Easton, Stoughton and Canton. The town of Needham voted, in town meeting, to instruct its Board of Selectmen to grant the New Haven Railroad a license to run buses through the town on the way from Needham Junction to Newton Highlands, and it is expected that this service will be started immediately.

**Buses in Erie.**—The Erie Coach Company, a subsidiary of the Erie Railways, Erie, Pa., is operating four 29-passenger Yellow buses over a route of 3 miles at a 10-cent fare. Some time ago A. R. Myers, president of the company, said that he was prepared to operate a bus line from the West Lake Road over the new state highway leading to the Erie Peninsula if the necessity existed for such travel.

**Bus Lines to Pay \$200.**—Under the terms of a new ordinance adopted by the Common Council of Neenah, Wis., effective Jan. 1, 1926, bus lines operating in the city will be required to pay a license fee of \$200 instead of \$50 for each bus operated as the share of the growing cost of maintenance of streets. Several of the Councilmen favored raising the fee to \$500 a year for each bus, but it was felt that in a test case the courts might hold this fee unreasonable.

**New P. R. T. Line Started.**—The Philadelphia Rural Transit Company, a subsidiary of the Philadelphia Rapid Transit Company, Philadelphia, Pa., has added a new bus route to its city-wide system. The new route, authorized by the Council and approved by the Public Service Commission, was planned to increase transportation facility along the Delaware riverfront. The route will provide transportation along the port of Philadelphia, particularly for workers of the industries located there. The standard single-deck gas-electric buses are being operated. The fare is 10 cents with 3-cent exchanges to all connecting lines.

**Bus Line at Cincinnati Bought.**—The Cincinnati Street Railway, Cincinnati, Ohio, has bought from Dale McKay the bus line which he has been operating between Mariemont and Oakley. The purchase is subject to approval by the Ohio State Public Utilities Commission, which will hold a hearing at Columbus Jan. 19. At the same time the commission will hear an application of the railway to increase the equipment and service of the bus line from three to nine buses and to extend the line from Oakley to Government Square. The Cincinnati Street Railway proposes to run buses twenty minutes apart from 6 a. m. to midnight. In the event the sale is approved by the commission, it will mark the first transaction of its kind since the railway announced its decision to enter the bus field.

## Financial and Corporate

### Deficit Piles Up Under City Operation

**Thirty-Mile Road on Staten Island Lost \$503,768 in Five Years Under Hylan**

The Staten Island Midland Railway, operated by the city authorities of New York, piled up for the fiscal year ended June 30, 1925, the largest deficit for any similar period of the five years of municipal operation. The road went behind \$103,595, exclusive of any interest or depreciation charges. These figures were derived from the annual and monthly reports of the Department of Plant and Structures made to the Transit Commission.

As the road carried 9,112,421 passengers in the year, the deficit was 1.14 cents per passenger. In other words, the passenger paid a 5-cent fare and the city paid the deficit in the cost of his ride out of taxes.

The Staten Island Midland Road went into receivership, stopped operation and was finally taken over by the city under lease five years ago as an experiment in municipal operation. In no year within this period has the city taken in enough to pay all the expenses.

#### 1.69 CENTS LOST PER PASSENGER

If the sum of \$50,000, the interest at 5 per cent on the \$1,000,000 of first mortgage 5 per cent bonds of the railroad, were included in the results of operation, as they would have to be if the road paid its own way, it would increase the deficit to 1.69 cents per passenger. For the first seven months of operation, 1920-1921, the deficit was at the rate of 0.8 cents per passenger; for the fiscal year 1922, 0.61 cents per passenger; for the fiscal year 1923, 0.39 cents per passenger; for the fiscal year 1924, 0.93 cents per passenger, and including the 1925 deficit, an average of 0.7 cents per passenger over the whole period of municipal operation.

During the period from Dec. 1, 1920, to June 30, 1925, 38,961,517 revenue passengers were carried. The total deficit from operation for this period was reported as \$274,602. The addition of the interest of \$50,000 annually on the bonds of the company would increase the deficit over the entire period to \$503,768, or a deficit over the whole period of 1.29 cents per revenue passenger.

Other items would tend to make the actual deficit even greater. No provision has been made for depreciation during the last three years, either on the equipment purchased by the city or on the property taken over from the Staten Island Midland Railway. Prior to 1923 only \$21,530 was set aside for depreciation. In addition, certain rehabilitation work amounting to \$163,644 has been charged to capital as recoverable from the receiver of the Staten Island Midland Railway. Ordinarily, part of this amount would be charged against operating expenses

and thus further increase the deficit, but in this instance, under the agreement with the railroad, it has been entirely excluded from operating expenses.

The latest report of operations of the Staten Island Midland on file with the Transit Commission is for the month of November, 1925. The deficit for this month is \$20,311, compared with \$9,407, in November, 1923, and \$6,584.24 in November, 1924.

### Net Earnings Up in Baltimore

The United Railways & Electric Company, Baltimore, carried 204,341,300 revenue passengers from Jan. 1 to Nov. 30, inclusive. This figure compares with 209,082,005 for the corresponding period of 1924. The number of revenue passengers in November, 1925, was 18,718,923, an increase over November, 1924, when the figure was 18,274,054. The decrease in the total for the eleven-month period is largely due to the extension of fare zones which took place in 1925.

The passenger revenue during the eleven months of 1925 was \$14,948,867, an increase of \$128,166 over the similar period of 1924. The revenue from this source during the past November was \$1,369,348, an increase of \$28,951 over the previous November.

Total revenues for the first eleven months were \$15,147,802, an increase of \$132,502. Total revenues for the past November were \$1,387,566, an increase of \$31,246.

Net income for the first eleven months was \$796,531, an increase of \$36,156, or 4.76 per cent, over the similar period of 1924. The net income for November, 1925, was \$91,796, an increase of \$449 over November, 1924.

### Sale Under Foreclosure at Kansas City Set for Jan. 4

Announcement of the postponement of the sale of the property of the Kansas City Railways, Kansas City, Mo., from Dec. 14 to Jan. 4 was made by John T. Harding, special master and commissioner in charge of the sale, after P. C. Groner, William G. Woolfolk, and A. J. Higgins, representing the Newman interests, had requested that additional time be given them because they believed they would be enabled to have the remaining first mortgage bonds and notes deposited with the reorganization committee. Before making the announcement, Mr. Harding made several futile attempts to reach Judge Kimbrough Stone of the federal court, referee, who was in St. Louis at the time.

On the day set originally for the sale, it was said 96 per cent of the first mortgage bonds and notes were on deposit with the reorganization committee headed by the Newman-Woolfolk interests, which are expected to bid in the railway.



## Interborough Deficit Reduced

New York Company Which Transported 1,089,544,225 Passengers Last Year Shows Slight Gain in Net

Gross operating revenue of the Interborough Rapid Transit Company for the fiscal year 1924-1925, made public on Dec. 23, increased \$645,215 compared with the fiscal year ended June 30, 1924. Non-operating income, however, was \$110,562 less than during the previous year, making the net increase in revenue from all sources for the year \$534,653.

### OPERATING EXPENSES REDUCED

Total operating expenses, including actual maintenance expenditures in excess of contractual provisions, were \$690,936 less than in the preceding year. These gains were offset, however, by increase of \$536,060 in taxes and increase of \$676,012 in allowances for income deductions. The net result for the year was a deficit of \$345,508 after allowance for all expenditures and income deductions. This is \$13,517 less than the deficit reported for the previous year.

There was an increase in the number of passengers carried for the fiscal year in question. This figure reached a total of 1,089,544,225 compared with 1,074,343,243 for the preceding year. The increase was 15,200,982—the net result of a subway gain and an elevated loss. On the subject of additional service provided during the year the report showed that 7,542,077 additional car-miles were operated.

Among the improvements to the physical plant was an alteration in the covering of platform columns at Grand Central Station which illustrates how inches count in aiding a freer movement of passengers. The original tile coverings were removed and 2-in. concrete substituted with a net saving of about 4 in. in space around each of the pillars.

In addition to sums spent for current operations of the lines, the company expended about \$6,700,000 for new subway cars, additional shop and power facilities, contribution toward construction and equipment under agreement with the city.

### A. W. Sperry to Survey Hartford-Springfield Road

Harrison B. Freeman, receiver for the Hartford & Springfield Street Railway, Warehouse Point, Conn., has engaged A. William Sperry, New Haven, to survey the company's property preparatory to an early move on the part of counsel for the bondholders to bring foreclosure action. This move is in line with a suggestion made some time ago by Judge Brown to Francis R. Cooley, chairman of the protective committee. The company has been in the hands of a receiver since October, 1918.

Recent changes in transportation methods have resulted in the development of a service in which twelve trolleys and fourteen buses are used. The company's franchises include ter-

ritory on both sides of the Connecticut River. Receiver Freeman reports that over the past six months receipts of the company have more than covered costs, due, he believes, to the development of the company's bus business.

### Proposal to Change Municipal Accounting at San Francisco

Unsatisfactory methods in accounting, particularly with regard to depreciation reserve funds, have caused a movement before the Supervisors of San Francisco, Cal., to revise procedure with the municipal railway. The present ordinance provides an 18 per cent cut from gross revenue for the depreciation fund, to be used not only for depreciation but accident and damage claims and bond redemption, but expenditures have not been confined to these purposes. At present only about \$750,000 remains in the fund after withdrawals for additions and betterments and to cover operating deficits. Additions and improvements projected by supervisors would more than wipe out this \$750,000.

Experts maintain that the municipal railway requirements at this time call for a depreciation reserve of \$2,900,000. Had the 18 per cent fund been kept intact except for expenditures dictated by the ordinance, the fund would now be about \$2,850,000.

The new proposal is to set aside a fund equal to 4 per cent of depreciable assets of the municipal road and equipment, to be determined at the end of the fiscal year, for replacements and reconstruction; yearly surpluses, if any, would be invested for the fund. In addition it is proposed to set up 2 per cent of gross annually for accident and damage claims and to allocate other necessary sums for interest and amortization of bonds. The funds would be started off with \$300,000 transferred from the present depreciation fund to the new depreciation fund and \$100,000 for accident and damage claims. If the Supervisors adopt the plan, their difficulties in financing improvements to which they are committed will be increased, but the municipal railway accounting will be on a sounder basis.

### Loss in Toledo in November

The Community Traction Company, Toledo, Ohio, showed a net loss to its stabilizing fund of \$19,952 as a result of operations in November, 1925. Revenue was \$286,126, compared with \$270,675 for a similar month in 1924, both being on same fare basis. In November 4,003,763 revenue passengers were carried for an average of 133,459 a day with five Sundays and a holiday cutting into the business quite heavily. The total deficit to the stabilizing fund is \$258,968 plus the original \$400,000 in the fund.

Street Railway Commissioner E. L. Graumlich announced that December and the first four months of the new year would probably show a surplus.

Board members approved the bill for \$21,427 submitted by Prof. H. E. Riggs, who conducted the recent transit survey. This amount exceeded the \$15,000 estimate made originally as the probable cost of the transit survey.

### Taxes of Road in Receivership Remitted

The State Board of Control of Connecticut has voted to remit the taxes of the Danbury & Bethel Street Railway, Danbury, Conn., since the time it went into the hands of a receiver in 1917. The action is conditional, however, upon payment by the company of back taxes due prior to the receivership. These amounted to \$22,377. The taxes remitted amount to \$41,000.

A. W. Sperry, New Haven, consulting engineer of the company, states the company is in the hands of a receiver because, prior to the receivership, it failed to sell its service to the public. He believes that under proper management the line can be made to pay. One of the principal handicaps under which the company works is the fact that it operates between the two towns over a single-track line. The cost of laying another track now is prohibitive.

**Approve Stock Program.**—Stockholders of the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., approved on Dec. 21 the program recently recommended providing for an increase in the authorized capitalization from \$40,000,000 to \$80,000,000. The plan contemplates increasing the common stock from \$20,000,000 to \$40,000,000 and reducing the par value from \$100 to \$20. It is expected additional preferred will be sold to investors over the counter.

**Profit in November.**—The Des Moines City Railway, Des Moines, Iowa, showed a profit of \$11,954 in November, bringing the deficit of the stabilizing fund to \$50,868. November was the second month the 10-cent fare was effective and the second month in which revenues have exceeded expenditures. The number of passengers carried in November was 2,102,982 and passenger revenue \$198,114, with operating expenses, depreciation and other charges amounting to \$155,869.

**Surplus \$31,234.**—The operating revenue of the Philadelphia Rapid Transit System, Philadelphia, Pa., for the month of November, 1925, was \$4,353,335, with operation and taxes of \$3,238,853. The surplus for the month was \$31,234. The total passenger revenue for the month was \$4,294,090. Of that amount \$4,157,035 was derived from surface, subway and elevated and \$137,055 from buses. The total number of passengers carried was 79,464,368, with 77,991,108, surface, subway and elevated passengers and 1,473,260 bus passengers.

### Purchase of Philadelphia Taxis Approved by Council

Purchase of the Yellow Taxi Company by the Philadelphia Rapid Transit Company, Philadelphia, Pa., was authorized on Dec. 29 by the Council transportation committee's approval by a nine to one vote of an ordinance which enables the transit company to increase its capital stock by \$5,000,000 and thus finance the buying of taxicabs. The taxicab project in Philadelphia by the P.R.T. has been followed closely in these pages.



## Personal Items

### J. M. Bamberger Heads Terminal Company

Julian M. Bamberger, president of the Bamberger Electric Railway, Salt Lake City, Utah, has been elected president and director of the Salt Lake Terminal Company. Other officers named are William Story, Jr., vice-president and director; Henry I. Moore, one of the receivers of the Salt Lake & Utah Railroad (Orem line), secretary-treasurer and director, and Frank Orem, assistant secretary. Other directors elected were A. B. Irvine, U. L. Balser and D. P. Abercrombie.

N. S. Wiltsie, general superintendent of the Bamberger Electric, has been elected general manager of the terminal company.

The reorganization was necessitated by the receivership of the Salt Lake & Utah Railroad. Mr. Bamberger succeeds Chapin A. Day, Ogden, as president. Mr. Day and Mr. Orem are the retiring members of the board of directors. The Salt Lake Terminal Company operates the terminal facilities in Salt Lake City for the Bamberger Electric and Salt Lake & Utah.

### C. W. Stocks Heads Bus Association

Carl W. Stocks, editor of *Bus Transportation* and associate editor of *ELECTRIC RAILWAY JOURNAL*, was elected president of the New York State Motor Transportation Association, formerly known as the Auto Bus Association of New York State, at a meeting held on Dec. 22 in Syracuse. Mr. Stocks was at one time statistician of the American Electric Railway Association. When Albert S. Richey appraised the Knoxville property he became resident engineer in charge of the appraisal. His transportation experience was further augmented with long service in the operating department of the Bay State Street Railway, now the Eastern Massachusetts Street Railway.

### C. M. Tew of Columbia Honored

Twenty-five years ago, or in December, 1900, Charles Matthews Tew, then a young man, entered the employ of the Columbia Electric Street Railway, Light & Power Company, Columbia, S. C., as a bookkeeper. A few days ago Mr. Tew was the guest of honor at a luncheon held at the Jefferson Hotel, Columbia, by officials and employees of the Broad River Power Company in celebration of the completion of a service with one concern extending over a quarter of a century.

True it is that the old Columbia Electric Street Railway, Light & Power Company, of which W. B. Smith Whaley was president, passed out of existence in 1911 when the name of the concern was changed to the Columbia Railway, Gas & Electric Company, but through the changes of name

and ownership Mr. Tew has held his place, his value as an employee being appreciated by incoming as well as outgoing administrations. At present he is paymaster of the company, now owned by the Barstow interests.

Mr. Tew was at first bookkeeper and later was made treasurer of the company. After E. W. Robertson secured control, Mr. Tew filled the position of auditor and so remained until September, 1924, when the Barstow interests bought the company.

### E. J. Burns with Beeler Organization

Edward J. Burns, who resigned as assistant general manager of the San Diego Electric Railway, San Diego, Cal., during the summer of the present year, has become affiliated with the Beeler organization in New York City.



Edward J. Burns

The addition of this persistent and efficient railway worker to the staff of such well known engineers and consultants will undoubtedly work to the mutual advantage of both employer and employee. Mr. Burns' name is indelibly written with that of Mr. Claus Spreckels in the rehabilitation of the San Diego property, following the disturbing war-time days. The results of the combined efforts of these men have been realized to the fullest extent in that city.

Mr. Burns, known as Ed Burns, started his career at the age of 14 as call boy on a steam railroad. He went through the shops and other mechanical departments and then entered electric railway work with the Utah Light & Railroad Company in Salt Lake City. Later he went to the Key Route at Oakland, Cal. Following this work he was employed with the bureau of finance of the California Railroad Commission. Mr. Burns did not confine his activities to electric railway work for he next went with the San Diego & Southeastern Railway, a steam line, as manager, later absorbed by the San Diego &

Arizona Railway. It was while he was on this property that he first attracted the notice of the Spreckels interests, which resulted in the Spreckels-Burns combination, whose accomplishments have become well known on the Pacific Coast and elsewhere. In San Diego they not only tried train operation and the weekly pass, but they secured a modification of the franchise exempting the company from paving and other expenses. They built the new La Jolla line to the beach at a cost of \$2,000,000 and made San Diego the first street railway on the coast to make use of the motor bus. In addition they increased the good will of the company as well as the actual earnings. When Mr. Burns resigned at San Diego recently it was said there was a possibility of his going to the East, but the decision to settle in New York was not made until a few days ago.

J. B. Eastman became chairman of the Interstate Commerce Commission on Jan. 1 under the rule of rotation by which the position is filled from among the commission members. Mr. Eastman was formerly a member of the Massachusetts Public Service Commission. He was appointed to the federal body by former President Wilson.

John T. Harrington, president of the Pennsylvania-Ohio Electric Company, Youngstown, Ohio, was elected president of the Trumbull Steel Company, Youngstown, on Dec. 16 at a reorganization meeting of directors. Philip Wiek of Youngstown has been president temporarily following the resignation of Jonathan Warner. Mr. Harrington's election as president of the Trumbull Steel Company in no way affects his connection with the Pennsylvania & Ohio Electric, of which he continues as president.

William Whiteford, assistant to the vice-president of the Twin City Rapid Transit Company, Minneapolis, Minn., has resigned, effective on Dec. 31, to become associated with the International Motor Truck Company at its new Northwest branch in St. Paul. Mr. Whiteford entered the employ of the transit company about twenty years ago as a clerk. Later he became general storekeeper and purchasing agent. Of late he has assisted Vice-President McGill in operation of the lines.

Alexander Shapiro, commercial manager of the Wisconsin Motor Bus Lines, affiliated with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has gone to Washington, D. C., to make a survey of the lines of the Washington Rapid Transit Company, operating buses in Washington, D. C., recently taken over by the North American Company, which controls both the Milwaukee properties and the Washington Railway & Electric Company. Mr. Shapiro is well known in the electric railway field through his long association with the North American Company and the American Electric Railway Association, of which he was statistician. It is understood that for the time being at least he will be acting manager of the bus company in Washington. H. H. England, former



general manager of the Washington Rapid Transit Company, will act as assistant general manager.

Manfred K. Toepfen has resigned from the position of chief engineer of the Michigan Public Utilities Commission. He has opened offices in Detroit, where he will engage in consulting engineering.

Miss Lois Anderson has been appointed supervisor of service of the Interstate Public Service Company, Indianapolis, Ind., reporting to Harry Reid president. Her duties will include inspection trips on the railway and like visits to local offices. About a year and a half ago Miss Anderson accepted the position of assistant to the director of public relations in the company's office in Indianapolis.

## Obituary

### M. W. Flanigan

Mortimer William Flanigan, one of the best known electric railway men in western Pennsylvania, died on Dec. 12 from lobar pneumonia. Mr. Flanigan, superintendent of the north side division of the Pittsburgh Railways, was familiar to thousands of north side car riders. Born in Renovo, Pa., on Nov. 25, 1879, he went to Pittsburgh in 1899, relinquishing his office as general manager of the Westmoreland Railways in Derry, Pa., and becoming a division superintendent in Pittsburgh. He was a nephew of the late John Murphy, once general manager at Pittsburgh.

### L. H. Griffith

Luther Henry Griffith of Seattle, Wash., one of the organizers of the West Street, Lake Union & Park Transit Company, which consolidated with the Seattle Street Railway and later became the Seattle Electric Railway & Power Company, died suddenly in Seattle on Dec. 14. Mr. Griffith was associated with many of the important industries in the upbuilding of Seattle, including the Green Lake Railway & Power Company, and the plan of connecting Lakes Union and Washington with Puget Sound by a maritime ship canal. He was head of a \$1,500,000 enterprise that built the electric line from Seattle to Tacoma in 1891 and promoted the Seattle Railway, opened in 1889. Other notable achievements of Mr. Griffith included the construction of the first electric line in Guatemala, construction of the first electric plant in Blaine, organization of the Seattle National Bank and the Boston & Alaska Transportation Company. Mr. Griffith was born in August, 1861. He completed his education at Cornell College in 1883. He settled in Seattle in 1886.

Allan B. Smythe, superintendent of police of the International Railway, Buffalo, N. Y., is dead. Mr. Smythe was instrumental in bringing about the arrest and conviction of members of the Amalgamated who dynamited the Niagara Falls high-speed line train during the last strike. For several years he was employed by the Philadelphia Rapid Transit Company.

## 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

### "1926 as I See It"

#### Various Manufacturers Whose Names Are Withheld Express Briefly Their Hopes and Fears for the New Year

Predictions for the future are particularly interesting when given by men of high standing in the industry which they represent. The following statements, gleaned from manufacturers who are closely in touch with the electric railway industry, should prove of value, even though the actual sources of the information are not made known. In each case the manufacturer was asked to state briefly his expectations for 1926, at least so far as his product was affected by the electric railway industry. The lines covered are thought to be sufficiently varied to give some definite impression of economic prospects for the present year.

*Manufacturer of Steel Rails.*—"The excellent condition which has been prevalent in the steel industry during 1925 will, in all probability, continue at least through the first half of the present year. Unfilled orders continue at a high total, considerable maintenance and extension work on steam and electric roads is in prospect, and the industry as a whole is expected to respond to the general economic stimulus which reached a peak during the past year."

*Manufacturer of Trolley Wire.*—"We are not looking for an exceptional year in 1926. With the exception of certain proposed electrification projects in steam railroads, little extension work is in prospect at present. Copper will probably not exceed 15 cents per pound—the figure upon which we have calculated our selling budget—for the major portion of the year."

*Car Manufacturer.*—"Present indications are that car orders through 1926 will not decrease over the past year, at least so far as the electric railways are concerned. Any falling off in orders which may occur, however, will probably not manifest itself until late spring or early summer, as the industry is assured of a certain amount of activity following the publication of annual budget reports."

*Bus Manufacturer.*—"A year of continued expansion, increased production and new developments in bus design is our forecast for 1926. Many additions to existing operating fleets are contemplated and, in addition, numerous other railways are considering the advisability of supplementing their trolley service with co-ordinated bus operation."

*Ticket Manufacturer.*—"The year 1926 should prove a fairly good one for our industry. With economic prosperity the number of people riding on various transportation agencies increases. Naturally this stimulates the

use of transfers and tickets. It is interesting to note, however, that the demand for theater tickets is inversely proportional to employment, so that this phase of our business is just now subject to a certain slackening off."

*Manufacturer of Car Fittings.*—"The electric railways are apparently not due to suffer very severely from 'growing pains' during 1926. Few orders have been received from these sources in recent months, and this year will probably not herald many large additions to rolling stock. Steam railroads are showing more activity in this direction. Recent developments have shown that the lull in orders experienced a few months ago was merely a temporary condition."

### Record-Breaking Order

#### Yellow Coach Company Designated to Supply 333 Gas-Electric Buses for Public Service Company

More than \$3,000,000 will be spent all in one lump by the Public Service Transportation Company of Newark, N. J. This has been set aside for the purchase of 333 gas-electric 29-passenger motor buses. The new equipment will be obtained from the Yellow Truck & Coach Manufacturing Company of Chicago. It was stated by J. A. Ritchie, president of the Yellow Coach company, that this is the largest single order ever written for automotive units.

Decision to make this material addition to the bus equipment of the transportation company was announced on Dec. 24, but the manufacturer to whom the contract would be given had not been determined at that time. Several days later the transportation officials announced their choice of the Yellow Coach company and stated that delivery of the new equipment would begin in February and would continue at the rate of approximately 100 a month until the order was completed.

Electrical equipment for the new buses will be supplied by the General Electric Company and will be sent directly to the Chicago plant of Yellow Coach, to be there incorporated into the units. The possibility was suggested that some of the bodies might be built in the Plank Road shops of the Public Service company in order to facilitate the placing of the buses in service.

The new equipment, together with Yellow buses now operated by the Transportation company, will constitute a fleet of 411 units of this manufacture. During the past 2½ years the company has expanded its service through the purchase of independent operations and the installation of new routes until its fleet today numbers 800 buses. Many of the miscellaneous and obsolete units have been scrapped, to be replaced with modern equipment,



and it is expected that the entire fleet will be standardized before long. The New Jersey company is the largest operator of motor buses in the country at the present time.

### American Creosote Works Gets Norfolk Plant

American Creosote Works, New Orleans, La., has announced the completion of its plans to purchase the Atlantic Creosoting & Wood Preserving Works at Norfolk, Va. A large

water-front property fronting on deep water and adjacent to the Portsmouth Navy Yards has been acquired and it is now proposed to erect a large and modern creosoting plant to take care of expanding Eastern business.

W. H. Wales, formerly president of the Atlantic Creosoting & Wood Preserving Works, will be in charge and the entire personnel of the two companies will be retained. The new plant will be operated under the management of the Savannah Creosoting Company, a connection of the American Creosote Works.

## Snapshots of Industry in 1925

In Which Are Portrayed the Outstanding Features of the Manufacturing Year, With Particular Reference to Certain Industries Producing Materials and Supplies for Electric Railway Consumption

GENERALLY stabilized prices throughout a year of moderate purchasing with most of the operating companies holding to the even tenor of their ways but with an occasional large order causing manufacturers to sit up and take notice—that, in brief, was 1925, so far as makers of electric railway equipment were concerned. The trend of prices was, for the most part, gradually downward, although certain materials advanced slightly in response to localized conditions. Little of the general economic stimulus prevalent in industry as a whole made itself felt among producers of equipment and materials whose consumption was limited solely to electric railways.

Leaving this specialized field for a moment, however, and considering the economic condition of the country as a whole, it becomes apparent that the year which has just come to a close was a truly noteworthy one from the standpoint of general industrial prosperity. Business was far more active than at the close of 1924 and although the gains in most lines have not been striking, they have been fairly regular. Agriculturally, the country falls considerably short of being as prosperous as it

might be, but other than in the farming districts, production, distribution, employment of labor, clearing of bank checks, and other recognized trade indexes, show an accelerated progress that has brought about an upswing of buying in almost every important industry of the nation.

Despite financial and political uncertainty existing in various other countries, the foreign trade of the United States for the first three-quarters of 1925 exceeded in value that of any full year prior to the war year of 1916. The total trade for 1925 will surpass the trade of any year excepting only 1917, 1918, 1919 and 1920. Considerable electric railway and bus equipment was exported, particularly to the Orient and to South America, although the competition with European manufacturers is becoming an increasingly serious problem.

Copper—Even with fluctuating foreign markets, causing a material slump in copper exports, this industry reported a better record in 1925 than was obtained during the year previous. Inasmuch as production in 1924 broke all former records save those made under abnormal war conditions, this achieve-

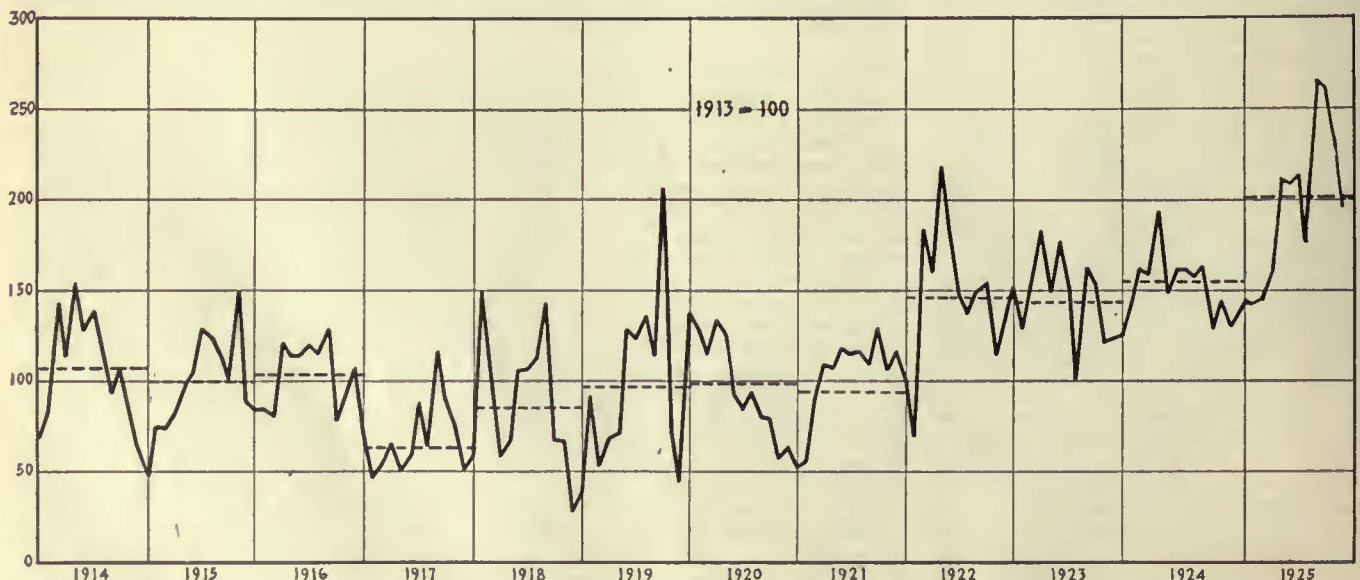
ment takes on added importance. The explanation lies in an assiduous cultivation of the domestic market by the producing companies and in increased efficiency of output and handling.

The manufacture of trolley wire has not touched abnormal heights, however. A keen degree of competition, a policy of watchful waiting and of slow buying among electric railways, and a not too rapid rate of electrification activity on the part of steam roads, have rather held production within well defined bounds.

Cars—A complete review of car manufacturing operations is given elsewhere in this issue. It is not necessary to recapitulate the information here. Suffice to say that but 1,612 cars were purchased by the industry throughout the year, most of the operating companies preferring to "sit tight" and keep outlays for new rolling stock to a minimum.

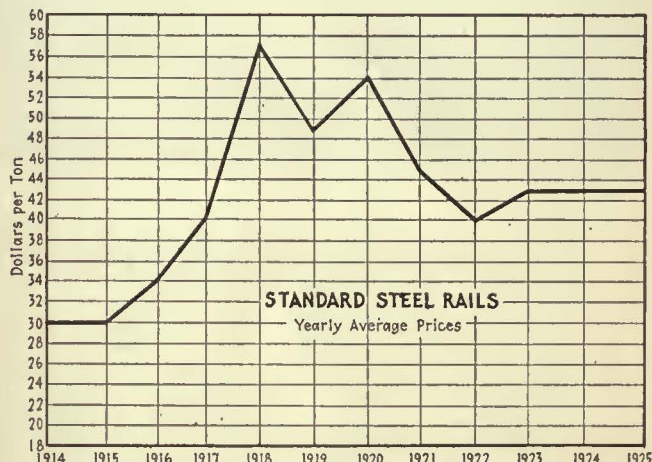
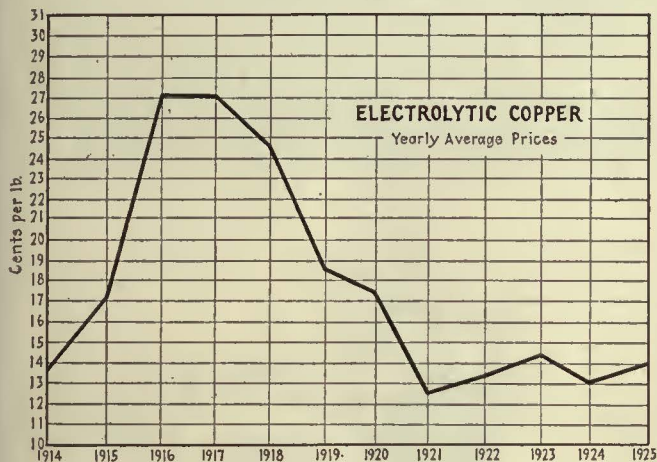
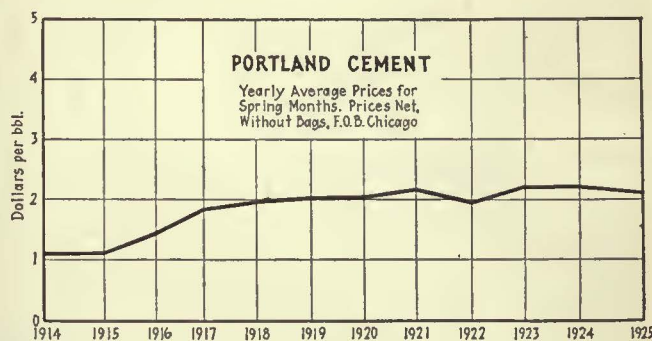
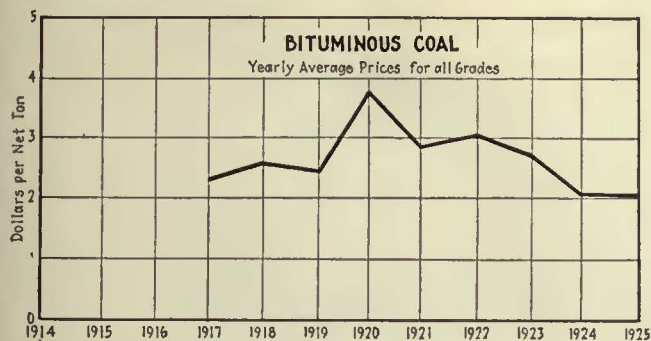
Steel and Iron—It is here perhaps that the general conditions of prosperity, current in the country throughout 1925, are better exemplified than in any other industry closely affiliated with the electric railway field. After a year of well-sustained and well-balanced activity, the iron and steel producers are in an agreeably strong position. Production of pig iron in the first eleven months of the year reached a total of 33,145,498 tons, as compared with 28,146,600 tons in the corresponding period of the preceding year. Steel ingot output in the same period is estimated at 40,211,069 tons, which compares with 33,241,906 tons in 1924. These totals show gains of 18 per cent in the output of pig iron and 21 per cent in steel ingot production. While prices have remained at a moderate level, reports of the leading companies clearly indicate that the industry as a whole will be able to report a fairly prosperous year.

As reported in the ELECTRIC RAILWAY JOURNAL for Dec. 19, the production of steel rails is one of the most important factors in the iron and steel industry, and it is the total of unreported orders for this material which makes it



General Construction Volume Index Curve Showing Response Made by All Types of Building Activity to Economic Prosperity





Representative Prices Indicated Over a Period of Years. Note Practical Absence of Fluctuation in 1925

impossible to determine the exact degree to which production during 1925 exceeded all records previously established. The Department of Labor states that practically all mills in steel centers have been operated on satisfactory schedules for the past month.

**Electrical Equipment.**—Demands for new equipment during 1925 have led prominent manufacturers in this field to believe that conditions are slowly improving in the electric and steam railway fields. Considerable sums have been expended in this direction for maintenance work and for bringing out-of-date and unsatisfactory equipment to a point somewhere approaching modern efficiency.

Particularly noteworthy has been the enthusiasm manifested in oil-electric motive power. Several steam roads have purchased oil electric engines and the New York Central is planning to try out an oil-electric articulated car on some of its branch lines. New developments have also been made in power plant equipment, automatic railway substations, and in general operating equipment.

**Buses**—A considerable momentum of production has been built up in the automotive field since the depression of last summer, and it is expected that this will tend to keep business active in this industry during at least the first part of 1926. Conditions are in a healthy state of balance at present; employment is large, prices relatively stable, and transportation facilities are ample and efficiently operated. Credit conditions in this field are said to be exceptionally sound and with the careful control of production which is now the rule, the expectation of active spring and early summer business

seems to be justified, barring, of course, unforeseen industrial disturbances of an inclusive nature.

A number of important mergers occurred in the bus manufacturing field during 1925, notably that involving the Yellow Coach Manufacturing Company with the General Motors Corporation and that of Graham Brothers with Dodge Brothers. Much attention has been given to the encouragement of co-ordinated bus and trolley service as a part of operating companies. The increased interest shown in gas-electric bus development has led many companies to add large numbers of these units to their fleets.

**Tires**—Plans are at present taking shape to break the British monopoly on rubber. The 50 per cent increase in tire prices made during the past year is due almost entirely to the exorbitant rate charged for crude rubber. In fact the price of the crude materials increased nearly 400 per cent over a period of about twelve months, and the retail prices of tires were only held down, partly by increased production efficiency and partly because early in the year tire makers worked on the basis of comparatively cheap rubber, contracted for during the fall of 1924. The rather startling total of \$700,000,000 is being taken in annually over and above what the British themselves agree would be a fair price. As long as the monopoly continues little relief can be expected, according to various authorities in the field.

**Coal**—Considerable stimulus has been given the bituminous coal industry of late due to the "bitter end" aspect of the anthracite strike. In consequence, fairly heavy buying has resulted and the prices of most of the grades have

advanced slightly in the past few weeks. Several soft coal mines, previously closed, have been reopened to help meet the increased demands, and a consequent increase in employment has manifested itself in the bituminous region. The average yearly price for all grades during 1925, however, was slightly less than that of the previous year.

**General Construction**—As illustrated in the accompanying construction volume index curve, the mean of construction for 1925 shows an important rise over that of the years immediately preceding it. This curve may be accepted as a reliable index of construction trend, since it is based on comprehensive reports embracing every type of industrial and commercial construction work.

### Safeguard for Magnetic Flagman

Characterized as the most recent contribution to the field of adequate crossing protection, the "Out of Order" signal is prominently featured in a recent catalog issued by the Magnetic Signal Company, Los Angeles, Cal. The manufacturers of the "Magnetic Flagman," which has been adopted as standard on a large number of steam and electric roads throughout the country, have been devoting considerable attention recently to the problem of obviating any dangers which might result from operating failures. That the automatic out-of-order signal meets this need has been satisfactorily demonstrated by the engineers of the company.

The catalog itself is very attractively arranged. Many interesting pictures and diagrams are included to clarify



the printed descriptions. Detailed specifications of the various types of magnetic flagmen are presented and their most important applications discussed.

### Dodge Brothers Increasing Factor in Bus Field with Merger

Dodge Brothers' position and lead in the commercial car field was further strengthened by the recent acquisition of a majority interest in Graham Brothers, largest exclusive producers of motor trucks in the country. More than 20 per cent of the combined production now consists of commercial cars, trucks, buses and chassis. Plant additions totaling about \$8,000,000 as financed out of surplus are expected to be completed early in 1926, production capacity being increased nearly 50 per cent thereby.

This large increase in production will make possible the reduced scale of prices recently announced by Dodge Brothers. With a month's production still to be reported, sales for last year are already 17,000 cars in excess of sales for the entire year of 1924 and are the largest heretofore in the history of the business, according to official figures issued by the company.

### Electrification Recommended as Aid to Farmers

How can the great triumvirate of manufacturers, transportation agencies and farmers work together to further their individual and mutual interests? This important question was discussed in detail at the annual banquet of the Illinois Manufacturers' Association held at the Hotel LaSalle, Chicago, on Dec. 9. Gerard Swope, president of the General Electric Company, spoke for the manufacturers; W. R. Cole, president of the Nashville, Chattanooga & St. Louis Railroad, represented the transportation field; while the agricultural interests were upheld by Eugene D. Funk, Bloomington, president of the American Seed Trade Association.

Mr. Swope advocated a greater development of electric power for the benefit of the three industries. He said that better power development in the United States must be had if the country is to maintain its position of leadership. Adding that the marketing of their products was the greatest problem before farmers, he declared that power development would prove of particular aid to the rural districts. Electrification would give the farmer a larger proportion of the amount for which the goods are sold to the consumer by increasing output and decreasing production expenses.

Mr. Cole, speaking for transportation, declared that, while the railroads were sympathetic with the efforts of the farmers to meet their various pressing needs, the present transportation costs are justly apportioned and are not to be blamed for the depressed condition of agriculture.

Mr. Funk, representing the farmers, voiced the opinion that the future of Middle West farmers is black unless something besides temporary solutions are found for the various agricultural difficulties.

### American Car & Foundry Enters Automotive Field

The American Car & Foundry Company has announced the formation of the American Car & Foundry Motors Company, this marking the first important entry by a railroad equipment company into the automotive field. The new company, which was incorporated in Delaware, will own a controlling interest in the Fageol Motors Company of Ohio, manufacturer of buses and trucks, and in the Hall-Scott Motor Company of Oakland, Cal., manufacturer of gasoline engines for motor trucks, airplanes and motor boats. The new company in turn will be controlled by the American Car & Foundry Company.

### Colonel Ayres Says What's What

Here is a prediction for 1926 which isn't anonymous. It is by Leonard P. Ayres, vice-president of the Cleveland Trust Company and an economist nationally known. His views appeared in the *Cleveland Plain Dealer*, following a speech made before the Chamber of Commerce on Dec. 15. He annually addresses the chamber on his forecasts for the coming year. It was found, upon checking his statements made a year ago concerning 1925, that they had generally proved correct.

A year of prosperity reaching its highest speed in late summer and then slowing up. Building construction rising to a new high record in the spring and then starting downward.

Building costs remaining high—proportionately higher for labor than for materials.

Iron and steel produced in even greater volume than in 1925, mainly on account of the demands of railroads. An automobile production of about 4,000,000.

The bull market on the stock exchange continuing until early next year, when the New York Federal Reserve Bank raises its rate and precipitates a "wave of fear."

Rising wages, rising costs of living, narrowing profit margins, higher wholesale and retail prices and a volume of industrial employment coming to a peak and turning down.

### Rolling Stock

Scranton Railway, Scranton, Pa., it is reported, plans to purchase additional one-man cars.

Durham Public Service Company, Durham, N. C., has placed an order with the Reo Motor Car Company for eight buses of 21 passenger capacity.

### Metal, Coal and Material Prices

Metals—New York		Dec. 7, 1921
Copper, electrolytic, cents per lb.	14.125	
Copper wire base, cents per lb.	16.00	
Lead, cents per lb.	9.25	
Zinc, cents per lb.	8.96	
Tin, Straits, cents per lb.	63.375	
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$5.00	
Somerset mine run, Boston, net tons	2.075	
Pittsburgh mine run, Pittsburgh, net tons	2.05	
Franklin, Ill., screenings, Chicago, net tons	1.875	
Central, Ill., screenings, Chicago, net tons	1.425	
Kansas screenings, Kansas City, net tons	2.30	
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$7.00	
Weatherproof wire base, N. Y., cents per lb.	18.25	
Cement, Chicago net prices, without bags	2.10	
Lined oil (5-bbl. lots), N. Y., per gal.	0.95	
White lead in oil (100-lb. keg), N. Y., cents per lb.	0.1550	
Turpentine (bbl. lots), N. Y., per gal.	\$0.99	

Miami Beach Railway, Miami, Fla., recently received twelve new cars. The specifications follow:

Date order was placed	July 24, 1925
Date of delivery	October
Builder of car body	Perley A. Thomas Car Works
Type of car	Light-weight, double-truck, one-man safety
Seating capacity	48
Total weight	36,000 lb.
Bolster centers, length	20 ft. 0 in.
Length over all	45 ft. 9 in.
Width over all	8 ft. 4 1/2 in.
Height, rail to trolley base	10 ft. 11 in.
Body	All steel
Interior trim	Cherry
Headlining	1/4-in. Agasote
Roof	Arch
Alr brakes	General Electric
Bumpers	Channel
Car signal system	Electric Service Supplies Company
Compressors	General Electric
Control	K-35
Curtain fixtures	Curtain Supply Company
Destination signs	Hunter
Door-operating mechanism	National Pneumatic
Fenders	Consolidated
Finish	Varnish
Gears and pinions	General Electric
Hand brakes	National Brake Company
Headlights	General Electric
Lightning arresters	General Electric
Motors	Four GE-265, 35 hp.
Registers	International
Sanders	Ohio Brass
Sash fixtures	O. M. Edwards
Seats	Hale & Kilburn
Seating material	Wood slat
Slack adjuster	American Brake Company
Step treads	American Abrasive Company
Trolley retracters	Chas. I. Earl
Trolley base	Ohio Brass, Form 4
Trucks	Brill, 76-E-1
Ventilators	Railway Utility Company
Wheels	Pollak Steel Company 26-in.

### Trade Notes

T. D. Owlser has been appointed railway sales representative at Chicago, for the Heywood-Wakefield Company, New York. He will take up his new duties after Jan. 1, following the retirement of Edward Buker, his former chief, who is going into business for himself.

Erie Electrical Equipment Company has announced the appointment of the Universal Electric Sales Corporation with offices at 30 Church Street, New York; 11 Beacon Street, Boston, and 332 Healy Building, Atlanta, Ga., to represent it in the states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, Eastern Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Tennessee and Alabama.

Fageol Company, Kent, Ohio, shipped five new buses to the Jacksonville Traction Company, Jacksonville, Fla., during the first half of December. The railway is under the executive management of Stone & Webster, New York. It will use the new units in its program of bus and trolley service co-ordination.

W. J. Nugent, vice-president and general manager of the Nugent Steel Castings Company, Chicago, has been elected president to succeed Charles Piez. Prentiss Coonley has been elected vice president and C. A. MacDonald, secretary, has been elected to fill a vacancy on the board of directors. Mr. Nugent has been associated with the company since 1918. The interests of Mr. Piez have been taken over by Mr. Nugent and others. The company was organized in 1916.





Pittsburgh Rys. Co.

**PEACOCK  
STAFFLESS  
BRAKES**



—*for modern city cars*

Light-weight, space saving dimensions, increased braking power and unlimited chain-winding capacity — these are the Peacock Staffless Brake advantages which have appealed to buyers in 1925. These same features should be your guide in specifying hand brake equipment for modern cars in 1926.

**National Brake Co., Inc.**  
890 Ellicott Sq., Buffalo, N. Y.

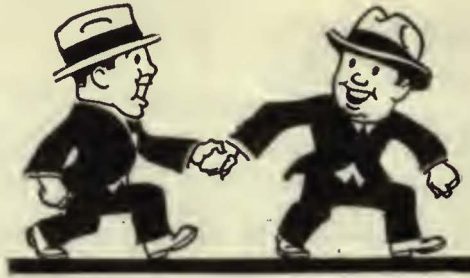
*Canadian Representative:*  
Lyman Tube & Supply Company, Limited, Montreal, Canada

—*for modern interurban cars*

Illinois Traction Co.







## Hand in Hand advertising and lower sales cost

It is to the buyer's interest to know that goods are *sold economically* for he pays the cost of selling just as he pays for the cost of manufacturing.

That's why more and more buyers are scrutinizing sales methods of manufacturers, for they know that excessive sales costs mean either higher prices or shrinking quality.

The seller who clings to antiquated, expensive methods of selling is no more entitled to patronage than one who runs an out-of-date factory.

Machinery has cut costs and standardized products in manufacturing and the *machinery of advertising* is accomplishing similar benefits in selling, for advertising in publications such as this one, is not an added expense, but an improved means of communication that takes the place of slower and more costly methods.

These are demonstrated facts and thinking buyers are recognizing the advantage to them of encouraging progressive, economical *sales* methods, such as have been adopted by the companies represented in the advertising pages of this journal.

The advertising these companies are doing not only cuts the cost of selling, but it increases production volume, standardizes quality, and is a guarantee of good faith.

Write us about anything you desire to know about business papers or the fields they cover.

The  
ASSOCIATED BUSINESS PAPERS, INC.  
Headquarters, 220 West 42nd Street, New York City

Over 120 Publications Reaching 54 Different  
Fields of Trade and Industry

**A. B. P.**

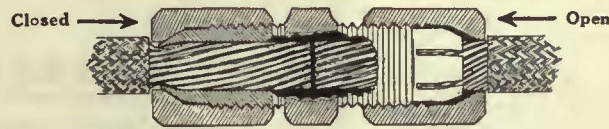
"Member of The Associated Business Papers, Inc." means proven circulations PLUS the highest standards in all other departments.

This publication is a member of the A. B. P.



# Frankel Solderless Connectors

for  
**Solid, Stranded and Flexible Cables**  
**Standard and Iron Pipe Size Tubings**



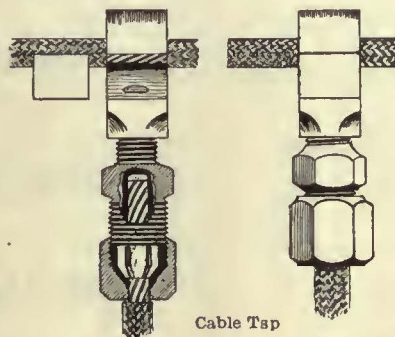
Sectional view of a Frankel Two-Way Connector showing one of the compression nuts in an open position and the other one closed, demonstrating how closely the conductor is gripped.

**ELECTRICALLY** Frankel Solderless Connectors will carry a full load with but 2° to 5° Centigrade temperature rise, as compared to the cable connected.

**MECHANICALLY** they will show no fatigue, holding both tensile strength and current carrying capacity for ∞. The standard connector will "pull" at approximately one-fourth the ultimate tensile strength of the cable.

**TIME OF APPLICATION** considered they require a minimum number of operations and a minimum amount of time to complete a joint.

**FRANKEL SOLDERLESS CONNECTORS** will show a saving in labor and material, and are superior to the best type of soldered or mechanical connectors.



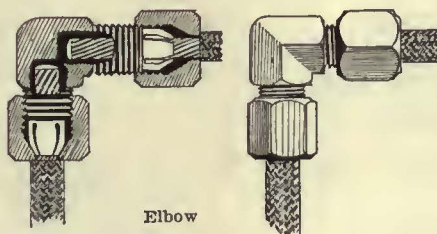
Cable Top



Front Lug



Three Way



Elbow

**APPROVED** by the National Board of Fire Underwriters for all classes of wiring, Frankel Solderless Connectors eliminate the necessity for solder in making electrical connections and splices.

**MADE FOR EVERY KIND OF CONNECTION**—such as angle and swivel lugs, two-way and three-way connectors, stud connectors, equalizers, reducers, elbows, Y's, service box lugs and plugs, terminal and switchboard lugs (front or back connected), grounding devices, etc.

**OUR ENGINEERING DEPARTMENT** will gladly assist you in the selection or design of the types best suited to meet your requirements.

*Send for Our Catalog 6-W*

Manufactured by

**FRANKEL CONNECTOR CO., Inc., 177 Hudson St., New York, N. Y.**

DISTRIBUTORS

*Sales Offices in All Principal Cities*

**Westinghouse Elect. & Mfg. Co.**

***Western Electric Company***



# Bankers and Engineers

## Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York  
PHILADELPHIA CHICAGO SAN FRANCISCO

## The J. G. White Engineering Corporation

Engineers—Constructors

Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

43 Exchange Place

New York

## STONE & WEBSTER

Incorporated

EXAMINATIONS REPORTS APPRAISALS  
ON

INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

New York

Boston

Chicago

## THE BEELER ORGANIZATION

ENGINEERS AND CONSULTANTS

Traction - Traffic - Equipment - Power Investigations

TRANSPORTATION, TRAFFIC, AND OPERATING SURVEYS

COORDINATING SERVICE—FINANCIAL REPORTS

APPRAISALS—MANAGEMENT

52 Vanderbilt Ave.

New York

## SANDERSON & PORTER ENGINEERS

PUBLIC UTILITIES & INDUSTRIALS

Design Construction Management  
Examinations Reports Valuations

CHICAGO

NEW YORK

SAN FRANCISCO

## J. ROWLAND BIBBINS

Engineer—2301 Connecticut Ave., N. W. Washington, D. C.

TRANSPORTATION SURVEYS

Organized Traffic Relief and Transit Development  
Co-ordinating Motor Transport, Railroad and City  
Plans, Service, Routing, Valuation, Economic Studies

EXPERIENCE IN 20 CITIES

## ALBERT S. RICHEY

ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

## ENGELHARDT W. HOLST

Consulting Engineer

Appraisals, Reports, Rates, Service Investigation,  
Studies on Financial and Physical Rehabilitation  
Reorganization, Operation, Management

683 Atlantic Ave., Boston, Mass.

## JAMES E. ALLISON & CO.

Consulting Engineers

Specializing in Utility Rate Cases and  
Reports to Bankers and Investors

1017 Olive St., St. Louis, Mo.

## JOE R. ONG

Consulting Transportation Engineer

Specializing in Traffic Problems and in Methods to  
Improve Service and Increase  
Efficiency of Operation

PIQUA, OHIO

## STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING  
CONSTRUCTION

YOUNGSTOWN, O.

FINANCING  
MANAGEMENT

## WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly Pass—Differential Fares  
Ride Selling

143 Crary Ave., Mt. Vernon, N. Y.

## HEMPHILL & WELLS

CONSULTING ENGINEERS

Gardner F. Wells

Albert W. Hemphill

APPRAISALS

INVESTIGATIONS COVERING

Reorganization Management Operation Construction

43 Cedar Street, New York City

## KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Public Relations

Rates

Operating Problems

111 W. Washington Street, Chicago, Ill.

## A. L. DRUM & COMPANY

Consulting and Constructing Engineers

VALUATION AND FINANCIAL REPORTS  
RATE STUDIES FOR PRESENTATION TO PUBLIC SERVICE  
COMMISSIONS  
CONSTRUCTION AND MANAGEMENT OF  
ELECTRIC RAILWAYS

230 South Clark Street  
Chicago, Ill.

215 South Broad Street  
Philadelphia, Pa.

## McCLELLAN & JUNKERSFELD

Incorporated

ENGINEERING AND CONSTRUCTION

Examinations—Reports—Valuations

Transportation Problems—Power Developments

68 Trinity Place, New York  
ST. LOUIS

CHICAGO

WASHINGTON



**Transmission Line and Special Crossing Structures, Catenary Bridges**

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

**ARCHBOLD-BRADY CO.**

Engineers and Contractors SYRACUSE, N. Y.

**DAY & ZIMMERMANN, INC.**

ENGINEERS

DESIGN - CONSTRUCTION - REPORTS  
VALUATIONS - MANAGEMENT

NEW YORK PHILADELPHIA CHICAGO

C. B. BUCHANAN President W. H. PRICE, JR. Sec'y-Treas. JOHN F. LAYNG Vice-President

**BUCHANAN & LAYNG CORPORATION**

Engineering and Management, Construction,  
Financial Reports, Traffic Surveys  
and Equipment Maintenance

BALTIMORE 825 Equitable Bldg. Phone: Hanover 2142 NEW YORK 49 Wall Street

**HUMAN ENGINEERING**

Railway Audit and Inspection Company, Inc.

Franklin Trust Building, Philadelphia

Boston New Orleans } BRANCHES } Baltimore Atlanta  
New York Pittsburgh } } Chicago St. Louis

**KELLY, COOKE & COMPANY**

ENGINEERS

Operation and Management  
Traffic and Transportation Surveys

424 CHESTNUT STREET PHILADELPHIA

**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.

**UNA** RAIL BONDS - RAIL JOINTS  
DYNAMOTORS  
WELDING ROD  
UNA Welding & Bonding Co.  
Cleveland, Ohio.



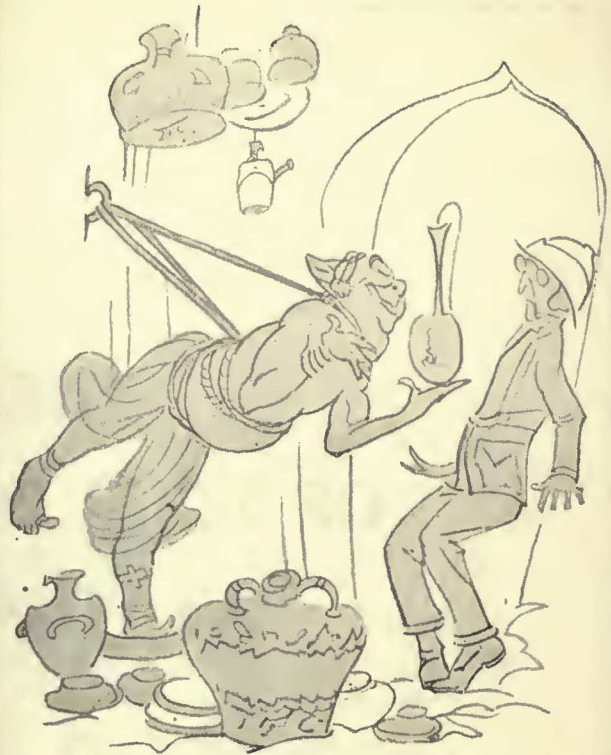
Adapted to all Types of rails and paving.

**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.



**DEKKO**

The Arabian junk dealer has for his motto "Stick to your job."

It is his custom to cut his feet and even to tie his body against any possible temptation to leave his post.

"Tied to the job" is the way we express it.

Of course we see many operators in this country that are tied to the job—usually by poor brushes—so that they too cannot leave their machines for a minute.

Let us point out here that both ties are self-inflicted and can be shaken off—one by Morganite brushes.

**Morganite Brush Co., Inc.**

Main Office and Factory  
519 West 39th St., New York

DISTRICT ENGINEERS AND AGENTS

- Pittsburgh, Electrical Engineering & Mfg. Co., 909 Penn Ave.
- Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.
- Cleveland, Electrical Engineering & Mfg. Co., 422 Union Building.
- Baltimore, O. T. Hall, Sales Engineer, 1926 Edmondson Ave.
- Revere, Mass., J. F. Drummey, 75 Pleasant Street.
- Los Angeles, Special Service Sales Co., 502 Delta Building.
- Son Francisco, Special Service Sales Co., 202 Russ Building.
- Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Avenue.
- Montreal, Can., Railway & Power Engineering Corp., Ltd., 326 Craig St., West.
- Winnipeg, Can., Railway & Power Engineering Corp., Ltd., P. O. Box 325.



# THE SALE OF YOUR POSSESSIONS— AT WHAT PRICE?



All industrial or commercial property is in a constant state of being sold. Q Depreciation, if properly passed on to purchasers of the product or service, represents a sale of property—at what price? Q A fire results in a sale of property to insurance companies—at what price? Q Practically every use of appraisal service crystallizes its function into one of *fixing the price* at which property in one way or another is sold. Q Retaining an appraisal organization is one of the most serious transactions into which a concern can enter.

**THE AMERICAN APPRAISAL COMPANY**  
A NATIONAL ORGANIZATION  
MILWAUKEE

VALUE IS A MEASURE OF COMPARATIVE DESIRABILITY





*A  
new name  
that's fifty-  
six years  
old ∞ ∞ ∞*

**GraybaR**



# Western

## SUPPLY

### *Changes name—*

Effective January 1st, that part of the Western Electric Company known as the Supply Department takes Graybar Electric Company as its name. This involves no change whatever in the existing distributing organization. Nor does it affect the facilities offered to buyers of electrical supplies all over the country. The significance of the change is found rather in the source of the new name, 56 years earlier in the history of the company.

In 1869 Gray and Barton began the making of electrical supplies. In the early seventies Western Electric was adopted as the company name. After Bell invented the telephone in 1876, telephones were added

GraybaR





# Electric

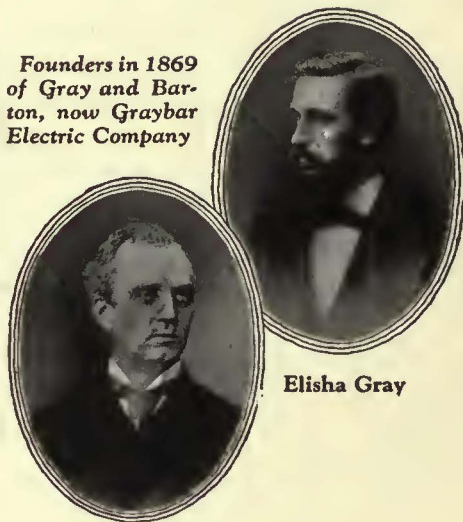
## DEPARTMENT

to the line, and in 1882 the company became the manufacturing department of the Bell Telephone System.

During all these years the company has carried on at the same time a merchandising business under the title of the Supply Department, selling to the American public all types of electrical products. The growing complexity of these dual responsibilities — on the one hand, to the Bell Telephone System; on the other, to the general user of electrical supplies—now makes it advisable to separate the two functions. Hence the Supply Department, serving as before in every electrical field, becomes a distinct corporate organization.

It takes the name Graybar, derived from Gray and Barton. A new name; but carrying with it a reputation 56 years old.

Founders in 1869  
of Gray and Barton,  
now Graybar  
Electric Company



Elisha Gray

Enos M. Barton

# GraybaR

ELECTRIC  
COMPANY INCORPORATED

SUCCESSOR TO SUPPLY DEPT.

*Western Electric*





*Looking  
forward  
to the next  
fifty-six  
years of  
service*

**GraybaR**  
E L E C T R I C  
C O M P A N Y . . . I N C O R P O R A T E D

SUCCESSOR TO SUPPLY DEPT.

*Western Electric*





*Above . . .*

One of several International 6-Cylinder Coaches owned by the Inter Cities Coach Company of Dayton, Ohio, and operated on the Dayton-Troy-Piqua-Sidney Division. These highly successful coaches succeeded others of well-known manufacture. The various bodies supplied for the 6-cylinder chassis carry 24 to 33 passengers. Regular equipment includes air brakes on all four wheels and every appointment detail known to highest grade coach manufacture.

International Harvester coaches are surpassed by none, considered from every standpoint—mechanical design, beauty, comfort, safety, etc. Detail comparison and performance records will make this clear to you.

## International Harvester 6- and 4-Cylinder Motor Coaches

**T**HE Harvester Company pioneered in coach building. Its oldest coaches are veterans working beautifully today. Its de luxe conveyances and its handy little speed sedans are keeping coach lines highly profitable and delighting passengers from Walla Walla down to Winter Haven.

Do you appreciate good service? Well, we take pride in ours—service delivered to our automotive customers through 112 branch houses, largest company-owned truck and coach service organization in the world.

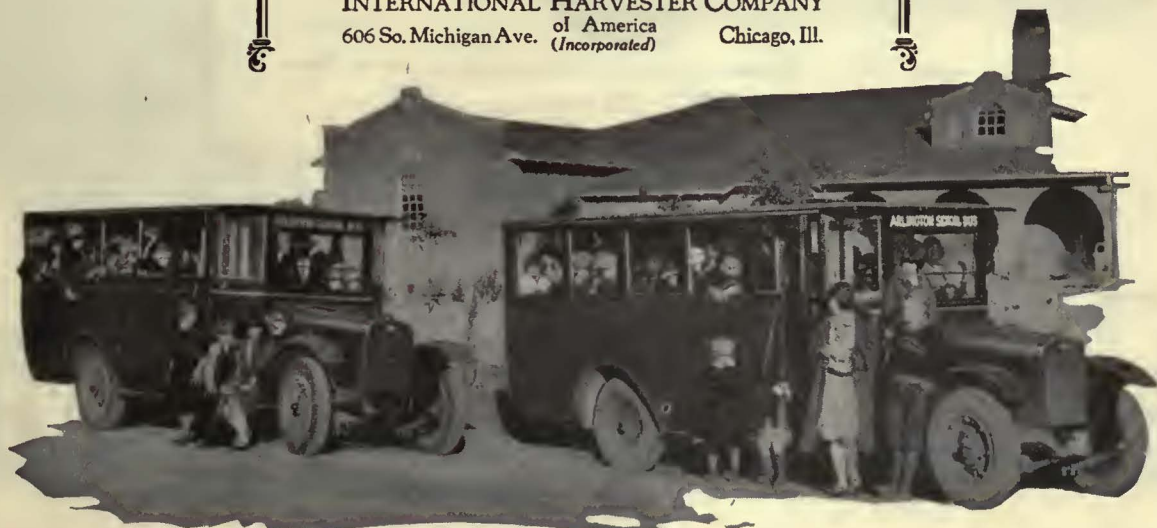
*Complete information on request.*

INTERNATIONAL HARVESTER COMPANY  
606 So. Michigan Ave. of America Chicago, Ill.  
(Incorporated)

*Below . . .*

Two of the International SL 4-Cylinder Coaches on the underslung chassis, in operation at Arlington, Florida. Each vehicle seats 50 school children comfortably.

The obvious features of the International SL 4-Cylinder Coach—sturdiness, flexibility, low and roomy design, and economical first cost and upkeep—recommend it for schools, golf clubs, suburban routes, station service, as auxiliaries to bigger coaches, etc. In Chicago they serve large department stores. In Memphis a bus line operator has developed one of the largest motor travel enterprises in the South, on International exclusively. He now has 58 of the 4-cylinder and a number of 6-cylinder International coaches.



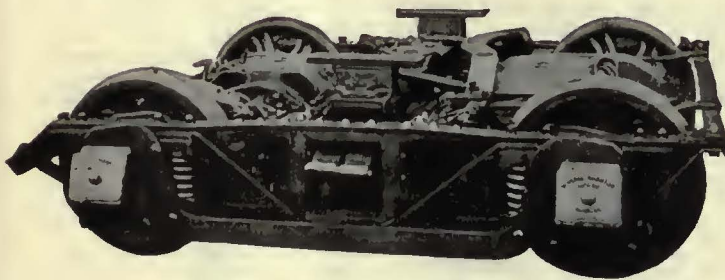




## Modern Light Weight Cars, and Gas-Electric Drive Motor Coaches to meet

Supplying the requirements of electric railways for over twenty-five years, this organization has developed principles of design and methods of construction which have always been abreast of the requirements of the time. We build light-weight, attractive and comfortable cars such as are in demand today.

We also furnish snow fighting equipment, work cars and light-weight trucks.



**Type MC 62 Truck**  
For low car bodies, city service—inside brake equalizer design, 26 inch wheels.

**Snow  
Sweepers  
Snow Plows**



*Our engineering department is at your service when considering the matter of new equipment. We will gladly submit drawings and specifications and quote therefrom, or bid on your specifications.*

# Cummings Car

*Successor to McGuire-Cummings Manufacturing Co.*





All the experience gained in building high class cars for electric railways is embodied in this new Gas-Electric Coach. Twenty-five, twenty-nine passenger and double-deck bodies can be furnished.

## every need of city and interurban transportation

Decided superiority in every detail marks this new Gas-Electric Coach. Upon a chassis of exceptional strength and perfect rigidity is mounted a body at once attractive, comfortable, and of long life. Wide deep seats, full leather upholstery, a wide aisle, plenty of headroom, wide windows, metal sash and abundant lighting equipment are individual features contributing to the excellence of the whole. The absence of clutches and gears eliminates noise, jerks and shocks when starting, gives faster, smoother acceleration, avoids driver fatigue, thus making for better schedules and improved safety, and decidedly improved riding comfort. In addition, the wear and tear of driving mechanism is diminished, reducing maintenance costs and operating costs, and lengthening the life of the Coach.

### MOTOR COACH BODIES

*to suit all requirements*



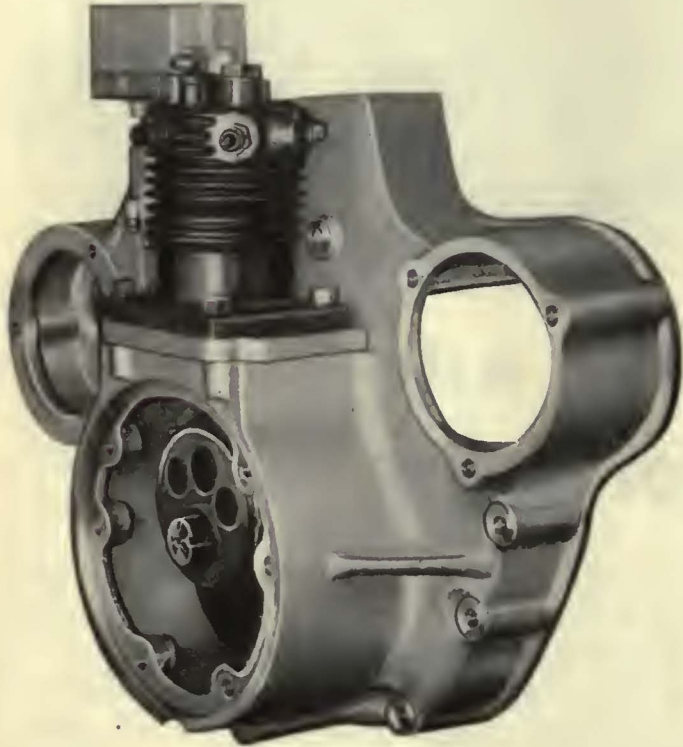
*We also furnish street railway type motor coach bodies for chassis of other manufacture.*

# And Coach Co.

**General Offices: 111 West Monroe Street, Chicago, Ill.**



# MOTOR BUS DEVELOPMENTS



*Specify  
"Christensen  
Air Brakes"  
on the buses  
you buy*

During the past year the greatest progress has been made in the application of air brakes to motor buses.

Two noteworthy developments by Christensen have been brought to their

**They are—**

## The Front End Compressor Mounting

The Front End Compressor Mounting was originated by Christensen two years ago, but the 1925 refinements in design and conditions in the bus industry have brought about its recognition in a most convincing way by motor manufacturers.

Six of the most important motor builders have made changes in the design of their products to accommodate the Christensen front-end mounting; a strong endorsement by those who KNOW.

The Front End Mounted Christensen Compressor is driven direct from an eccentric on the main crank shaft. No gear, belt, chain, or universal drive troubles are possible, for the direct drive eliminates their use entirely. It is the simplest, most durable drive available.

# Christensen

**CHRISTENSEN**  
6513 Cedar Ave.,





# AIR BRAKE IN 1925

present high state of usefulness during this period, and have been important factors in making possible the speed, safety, economy, and fatigueless operation necessary to present-day bus transportation.

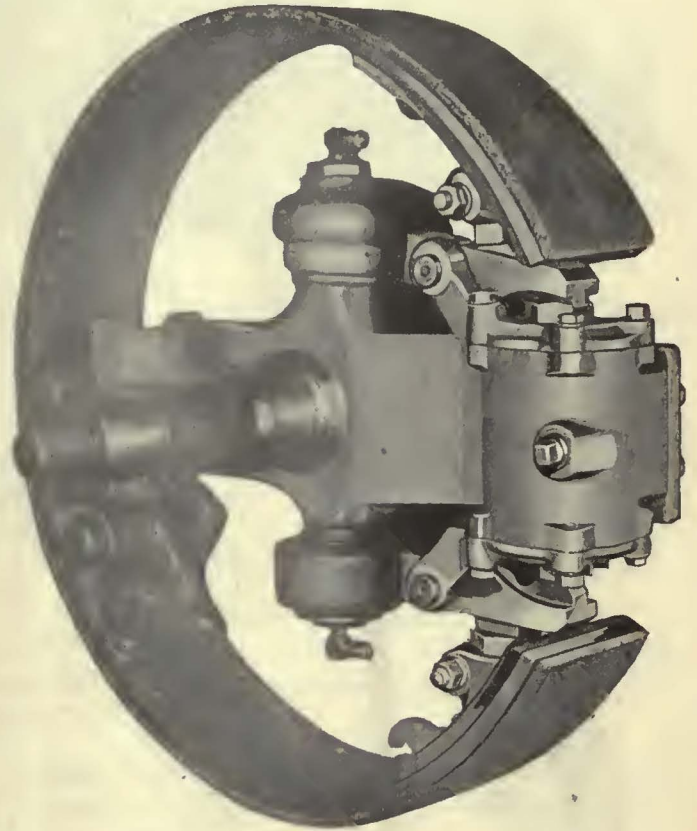
and

## The Enclosed Multiple-Power Brake

The Enclosed Multiple-power Brake was developed to deliver the power necessary for quick stops by very heavy vehicles—double-deck buses particularly. It follows out the Christensen principle of simplest possible mechanism, fully enclosed by the brake drum, with no outside levers, pull rods, cables, knuckles, universal connections or cams.

In the Multiple-Power Brake sturdy levers between the piston stems and the opposing ends of the brake shoe multiply the power of the piston thrust. Thus, with no increase in operating air pressure, the braking thrust may be doubled, tripled, or even further multiplied.

The only connection between wheels and frame is the flexible reinforced hose that carries the air to the cylinder.



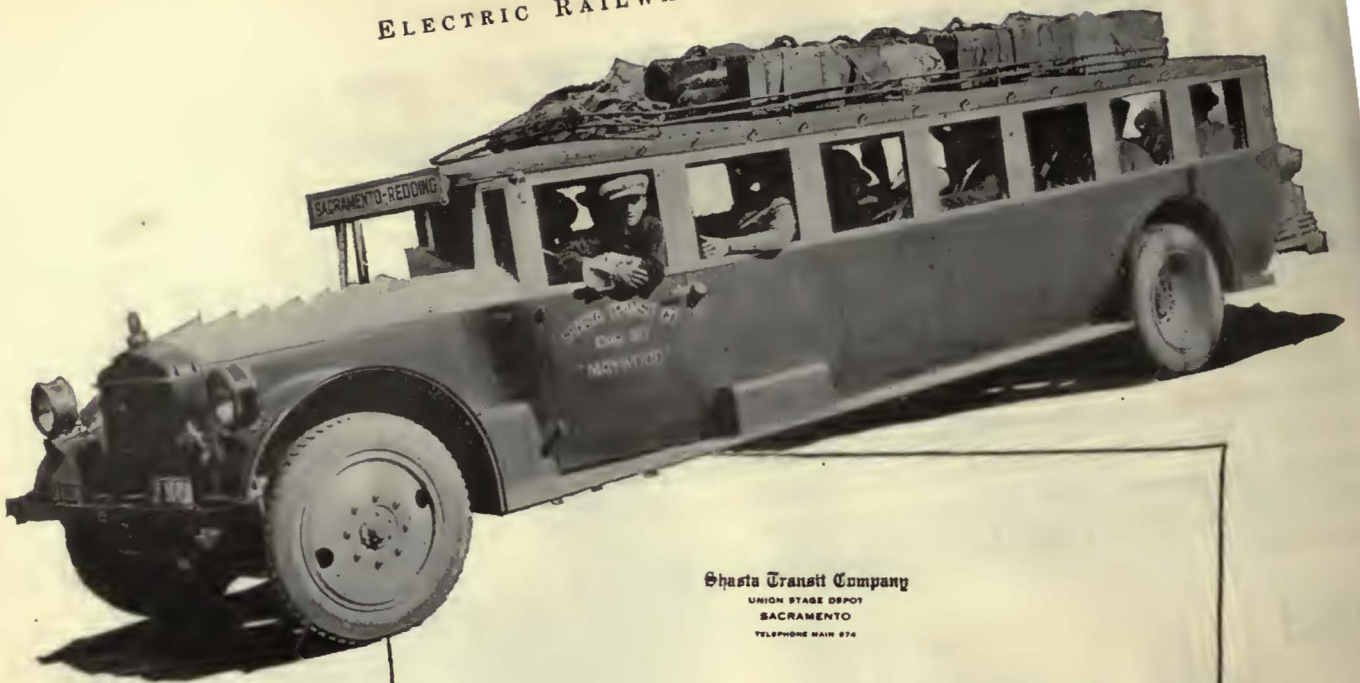
So important to the bus operating company are these two distinctly Christensen features that, if you are operating buses or contemplating their operation, you cannot afford to be without full knowledge of them. The complete Christensen system is described in the booklet "Christensen Automotive Air Brakes." *Send for a copy.*

# Air Brakes

AIR BRAKE CO.,  
Cleveland, Ohio.







Shasta Transit Company  
 UNION STAGE DEPOT  
 SACRAMENTO  
 TELEPHONE MAIN 876

November 7th, 1925.

The Fisk Tire Company, Inc.  
 1401 Kay Street  
 Sacramento, California.

Gentlemen: Attention of Mr. W.B. Jenkins.

We are writing this letter to express our satisfaction of the service we have received from Fisk Transportation Cords during the past summer and fall.

We operate between Sacramento and Redding and each of our stages run approximately 350 miles a day. We consider this a severe test on tires, especially in summer, as the thermometer registers as high as 114 degrees in the shade and the stages are running about 13 hours at a stretch. We maintain a strict schedule and uninterrupted service is a vital factor in the service we render to the public.

In view of the splendid service we have received from your product we are sending you this letter of appreciation together with a picture of one of our new cars equip with Fisk Fillerless Cords.

Yours very truly

CHW/w  
 Enc.

Shasta Transit Company  
 by *Geo. H. Woods.*

WE OPERATE STAGES BETWEEN SACRAMENTO AND REDDING AND MT. Lassen NATIONAL PARK



Time to Re-tire  
 Get a FISK  
 TRADE MARK REG.  
 U. S. PAT. OFF.

**FISK** TRANSPORTATION  
 "Fillerless"  
**CORDS**





## Winning Leading Patronage



*Thirty-three Passenger—Latest Approved Design—Worked Out from Actual Study of the Riding Public by Large Independent Successful Operator.*

One hundred thirteen of these bodies will soon be in service for the Detroit Motorbus Company. Those now in service are fulfilling the highest expectations of their engineers. The Detroit Motorbus Company was pleased with the careful engineering of the initial bodies. They are gratified with the rapidity with which these bodies are produced in quantities.

Large production resources—long experienced personnel—carefully selected materials—good common sense body construction—insure

quantity production of standardized types of bus bodies fit for heavy duty service with low maintenance cost.

These factors are winning the patronage of leading chassis manufacturers and large fleet operators.



**THE AUTO BODY COMPANY**  
LANSING, MICHIGAN







SO MUCH has been said and written about "service" during the last few years that the average business man is getting suspicious of the word. He knows that business isn't knight errantry, and that no commercial concern is operating with purely altruistic motives. So, as soon as he hears the word "service," he begins to grow skeptical. However, there is a kind of "service" which, though intended primarily to protect the seller, is also a benefit to the buyer.

For instance, we know that

## Standard Oils and Greases

are made right, from the highest quality crude oil especially chosen for its lubricating oil content, and that they will, if used correctly, give the most satisfactory results.

But—unless they are used correctly, the buyer cannot expect full satisfaction. No one grade of oil or grease will lubricate every machine properly. If the buyer uses the wrong grade for his equipment, he will be disappointed—and will probably blame it on the quality of our products.

Thus, we would lose a customer who might easily have become a constant purchaser if he had known how to select the right grade for his purpose. And the customer loses the satisfaction and the reduced operating costs that he might have secured by using the correct grades of lubricants.

Therefore, it is with a motive which is primarily selfish that we offer to our customers the services of our lubricating engineers. When our engineers have made a survey of a plant, and have recommended the grades of oils and greases that are exactly suited to its equipment, we know that the customer is going to be satisfied, and that we can count on him to become a steady purchaser.

This service, which we have established for our own protection, is also a benefit to the customer, for it enables him to get full satisfaction from the products he buys, and to enjoy all the advantages and savings that result from perfect lubrication of his machinery.

*We shall be glad to make a survey of YOUR plant  
if you will phone or write us. The service is free*

## STANDARD OIL COMPANY

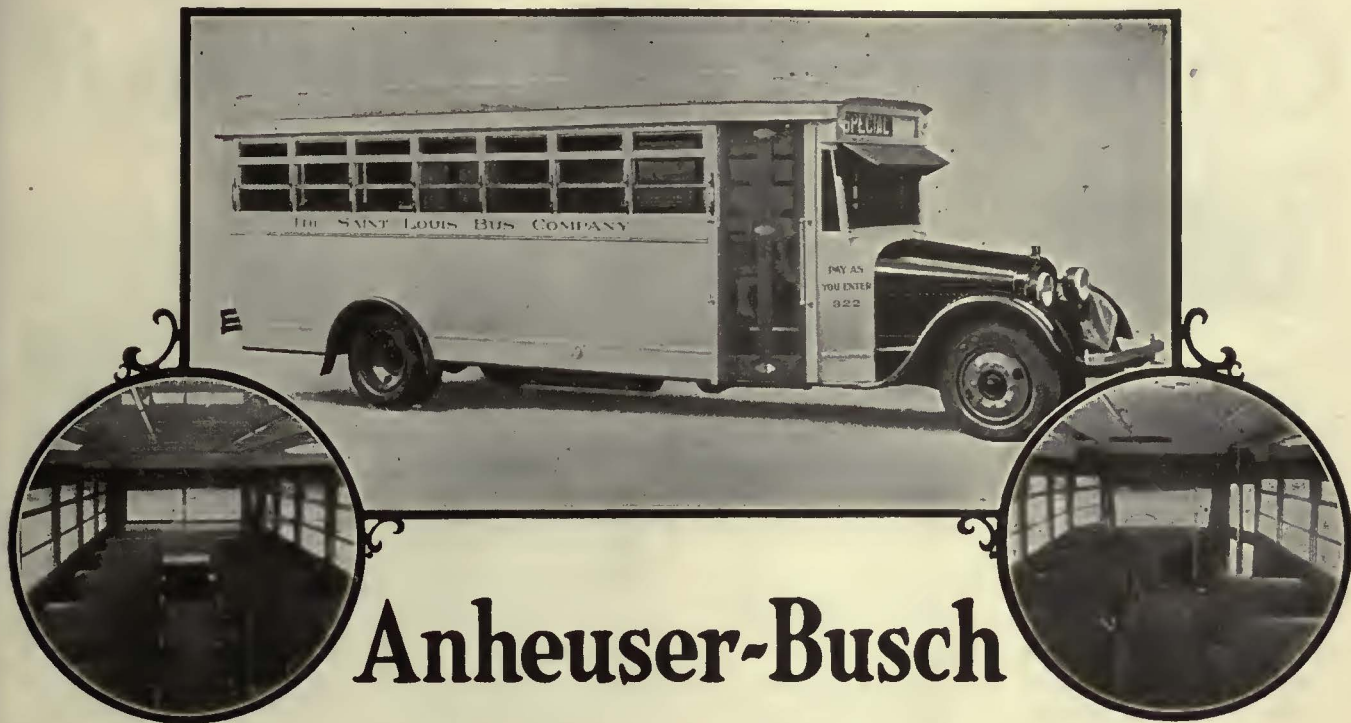
(Indiana)

General Offices: 910 S. Michigan Avenue

Chicago, Illinois







## Anheuser-Busch bodies chosen for St. Louis busses

Four real bus transportation salesmen have recently entered the service of the St. Louis Bus Company. They're the four pay-enter bus bodies designed and built by Anheuser-Busch.

Each carries 29 passengers, who enter thru wide, double folding doors, pay as they get in, and reach their seats by means of a wide, commodious aisle, without stepping over the knees of other passengers.

Even on darkest days, each passenger can read as he rides, for conveniently located lamps flood the entire interior with clear, white light. Snug protection or ample ventilation is provided by clear-vision windows that close tight or can be raised to let cooling breezes in.

Long ago officials of the St. Louis Bus Company realized that it is the bus body

that sells the service. And they made sure of a double advantage when they placed the responsibility for the new St. Louis bus bodies with this organization.

They made sure of bus bodies built by an organization which has been building finest vehicles for more than forty years. Bus bodies that look comfortable . . . that look safe . . . that look pleasant to ride in.

Any bus operator who is interested in better bus bodies will find much of interest in the handsomely illustrated booklet we will gladly send on request.

It gives complete details of the various types of bus bodies Anheuser-Busch builds—lists equipment and other wanted information.

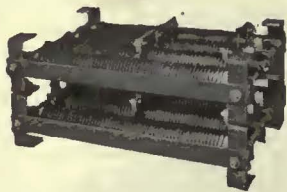
Sent free. Write for it. Address the

VEHICLE DEPARTMENT, ANHEUSER-BUSCH, ST. LOUIS

# Anheuser-Busch Bus Bodies



# Cool joints do not fail

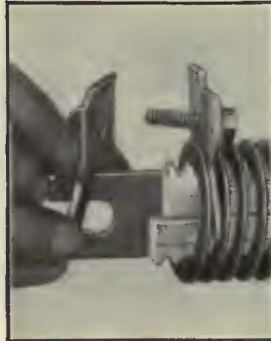


Monitor Edgewound Resistor assembled

**J**OINTS are weak points in the ordinary resistor. Poor joints mean excessive resistance, undue heating and possible burn-outs particularly in ribbon resistors. It is difficult to make and maintain good joints. Cast-iron grid resistors have about fifty joints in series in each section.

There are no series joints in Monitor Edgewound Resistors except where one unit is joined to the next. Where taps or terminals occur the joint is made with a powerful clamp which contacts completely with the ribbon.

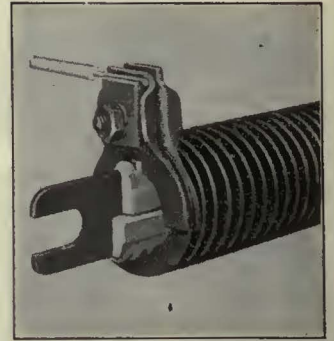
This is only one of the many superior features of Monitor Edgewound Resistors. Ask for bulletin describing the other advantages of Monitor Edgewound Resistors.



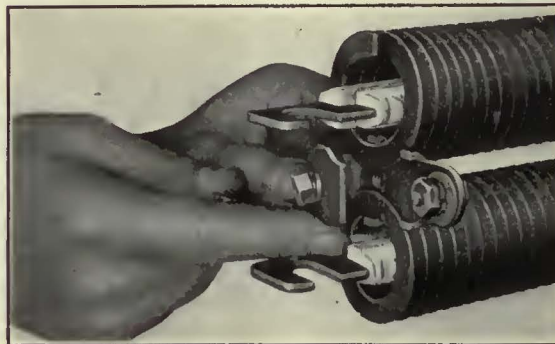
Method of making terminal connections on Monitor Edgewound Resistors.



This method of attaching wires insures a good, mechanically strong connection.



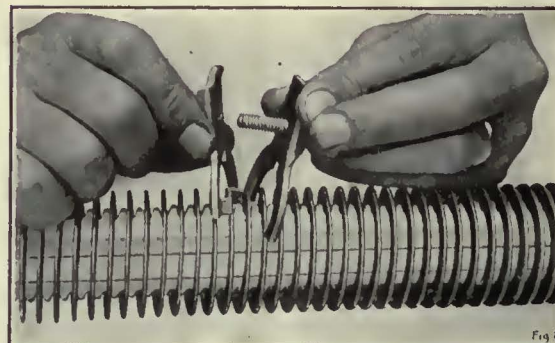
Terminal connection in place. The clamp terminal is rigid and will not work loose.



Method of joining adjacent Monitor Edgewound Resistor Units together electrically.



Bridging clamp in place. Note the terminal used for taking off tap.



Method of taking off tap on Monitor Edgewound Resistor. Tap can be placed at any point. Same type of clamp used as for terminals.



Tapped resistor unit. Clamp takes firm, rigid grip on ribbon and cannot work loose.

## Monitor Controller Company

BALTIMORE, MARYLAND

BIRMINGHAM	BOSTON	BUFFALO	CHICAGO	CINCINNATI	CLEVELAND
DETROIT	NEW ORLEANS	NEW YORK	PHILADELPHIA	PITTSBURGH	ST. LOUIS
		WASHINGTON			

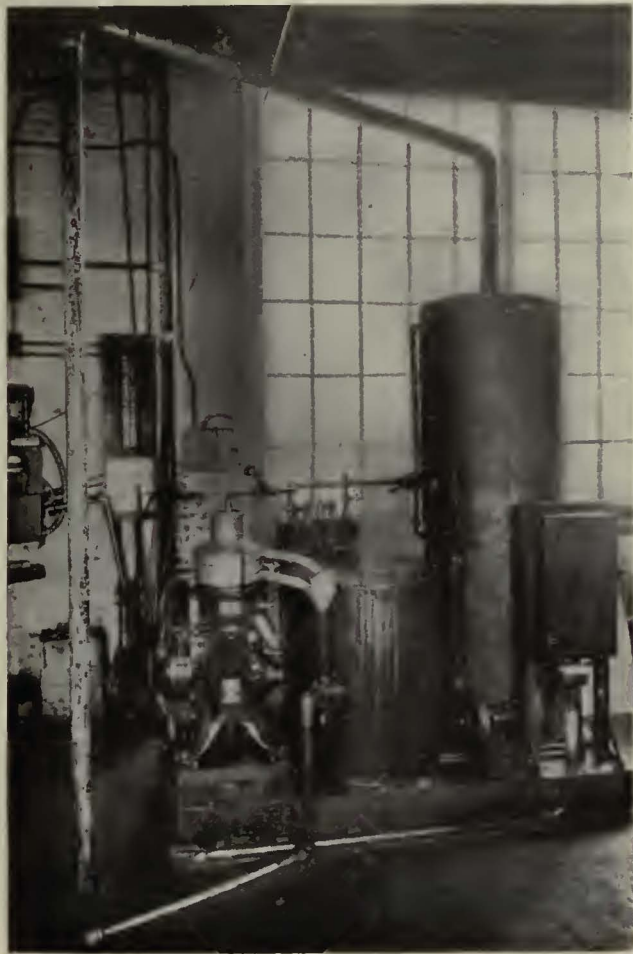


# Monitor Edgewound Resistor



# The best crankcase oil at 10 to 18 cents a gallon

**Car Axle Oil**  
reclaimed with profit, too



*The Yellow Cab Company, of Philadelphia, has used the De Laval Crankcase Oil Reclaiming Outfit shown above for about six months. It has recovered about 1000 gallons of oil each month and the total cost of recovery has averaged one-third the cost of new oil. Purification is so complete that new oil and reclaimed oil are stored in a common tank. Recovery averages 88%, the remaining 12% consisting of dilution, carbon, etc.*

With the De Laval Crankcase Oil Reclaiming Outfit you can reduce the cost of lubricating the motors of your trucks, cabs or buses 40 to 70 per cent — depending on the size of your fleet and the price you pay for oil. In addition, you can use better oil or drain oftener and still save money while materially reducing engine wear.

Street railway companies which operate buses can install a combination outfit capable of reclaiming both crankcase oil and car axle oil and thus materially reduce their yearly cost of lubricating rolling stock, while keeping it in more dependable operating condition.

Oil reclaimed by the De Laval Outfit is considered by the engineers of leading oil companies to be in every way as efficient as brand-new oil. It is free from carbon and other abrasive matter and tests practically the same as new oil as regards flash, fire and viscosity.

For all practical purposes, the oil coming from the De Laval Reclaiming Outfit is refined. Yet the process is so simple and the Outfit so fool-proof that it is easily handled by ordinary garage help—often in spare time.

You can probably save enough oil to pay for the De Laval Outfit in a year or less. Mail the coupon in order that you may be fully posted on this important development in the automotive industry.

## The De Laval Separator Company

165 Broadway, New York 600 Jackson Blvd., Chicago

DE LAVAL PACIFIC COMPANY  
San Francisco

# De Laval

## Crankcase Oil Reclaiming Outfit

We are interested in obtaining more efficient crankcase lubrication at lower cost. Please send full information.

Company .....

Individual .....

ERJ-614A

Address .....



# American BROWN BOVERI

## Power Rectifiers Efficient in Sub-Station Service under extreme load variation

Widely used in Europe for a number of years, Mercury-Arc Power Rectifiers have found their most popular application in the electric railway field. Their ability to effectively handle the fluctuations in load on railway lines without material loss in efficiency, from no-load, to high overload, is proved. There is no inertia of heavy rotating parts to be overcome.

On the accompanying chart are curves showing the comparative efficiencies of the three classes of conversion equipment—Rectifiers, Rotaries and Motor-Generators. This data was developed from actual tests. Note the great advantage of the mercury-arc rectifier at one-quarter load, an ordi-

nary condition on traction lines in non-rush hours.

Other advantages of the Mercury-Arc Power Rectifier are:—absolutely quiet operation, no moving parts except small auxiliaries, adaptable to full automatic operation, minimum maintenance required.

Further details of the principles, construction and operating features of this equipment will be given in subsequent advertisements.

Brown Boveri engineers have developed the Mercury-Arc Power Rectifier to a high degree of perfection in Europe. We are now prepared to build and install this type of equipment in America.

---

## Products of American Brown Boveri Electric Corporation

*Electric Locomotives  
for any system of current, high or low  
tensions  
Complete Equipment  
for railway electrification  
Mercury-Arc Power Rectifiers  
(steel enclosed)  
Diesel-Electric Locomotives  
Mining Locomotives*

*Motors (all sizes and types)  
Rotary Converters  
Motor Generators  
Transformers (power or current)  
Switches, Controllers  
and all Auxiliary Equipment  
Oil Switches  
Condensers and Auxiliaries*

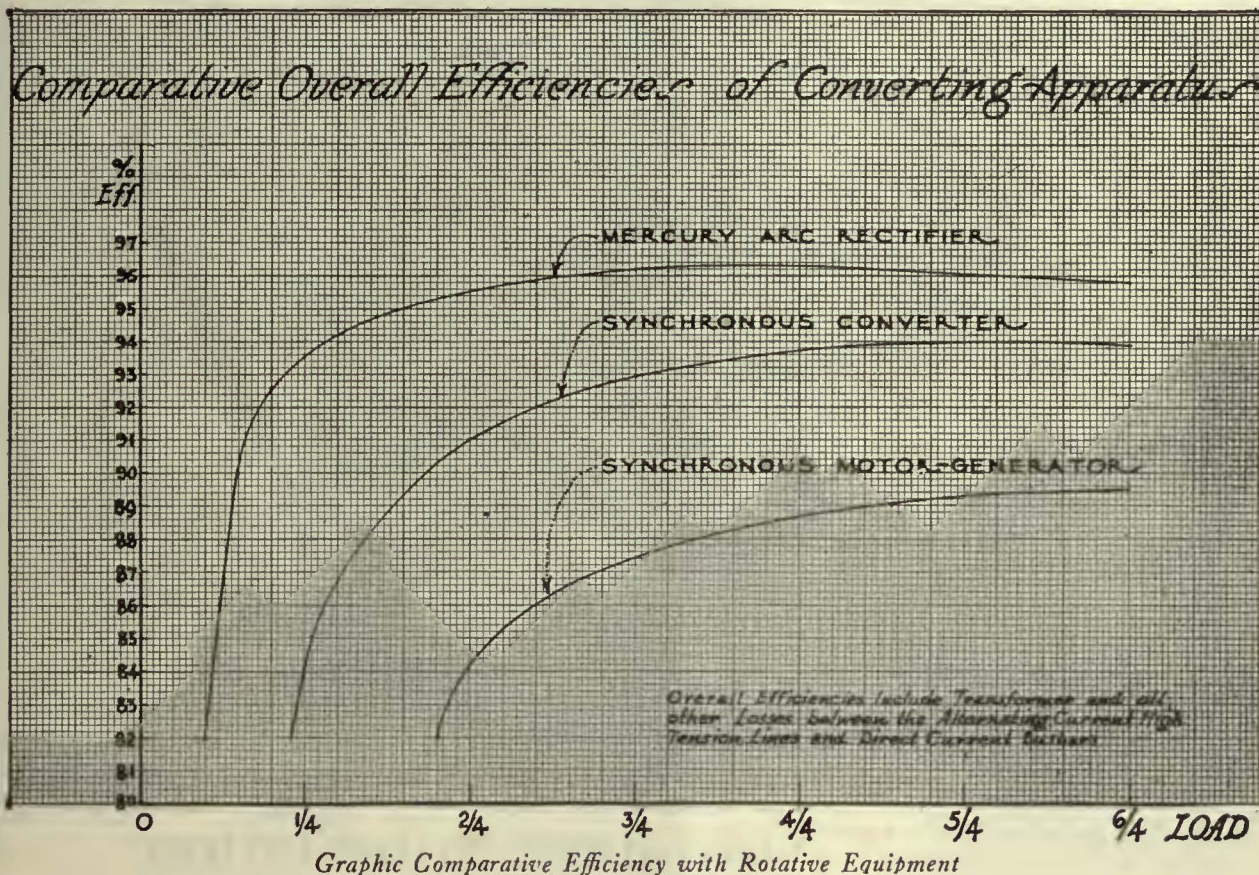
*Steam Turbo Generators  
for normal or high pressures and  
superheats  
Automatic Regulators  
Relays  
Turbo Compressors and Blowers  
Electric Furnaces  
Induction Regulators*

---



# Mercury-Arc Steel enclosed POWER RECTIFIERS

for sub-station service



Mercury-Arc Power Rectifiers pay for themselves quickly where D.C. load factor is variable or low.

In addition to their recognized position in the railway field, they can advantageously replace rotating equipment in Cen-

tral Station distribution and industrial application, not only because of their great efficiency, but because they are noiseless in operation, cause no vibration, do not require special foundation and occupy a minimum of space.

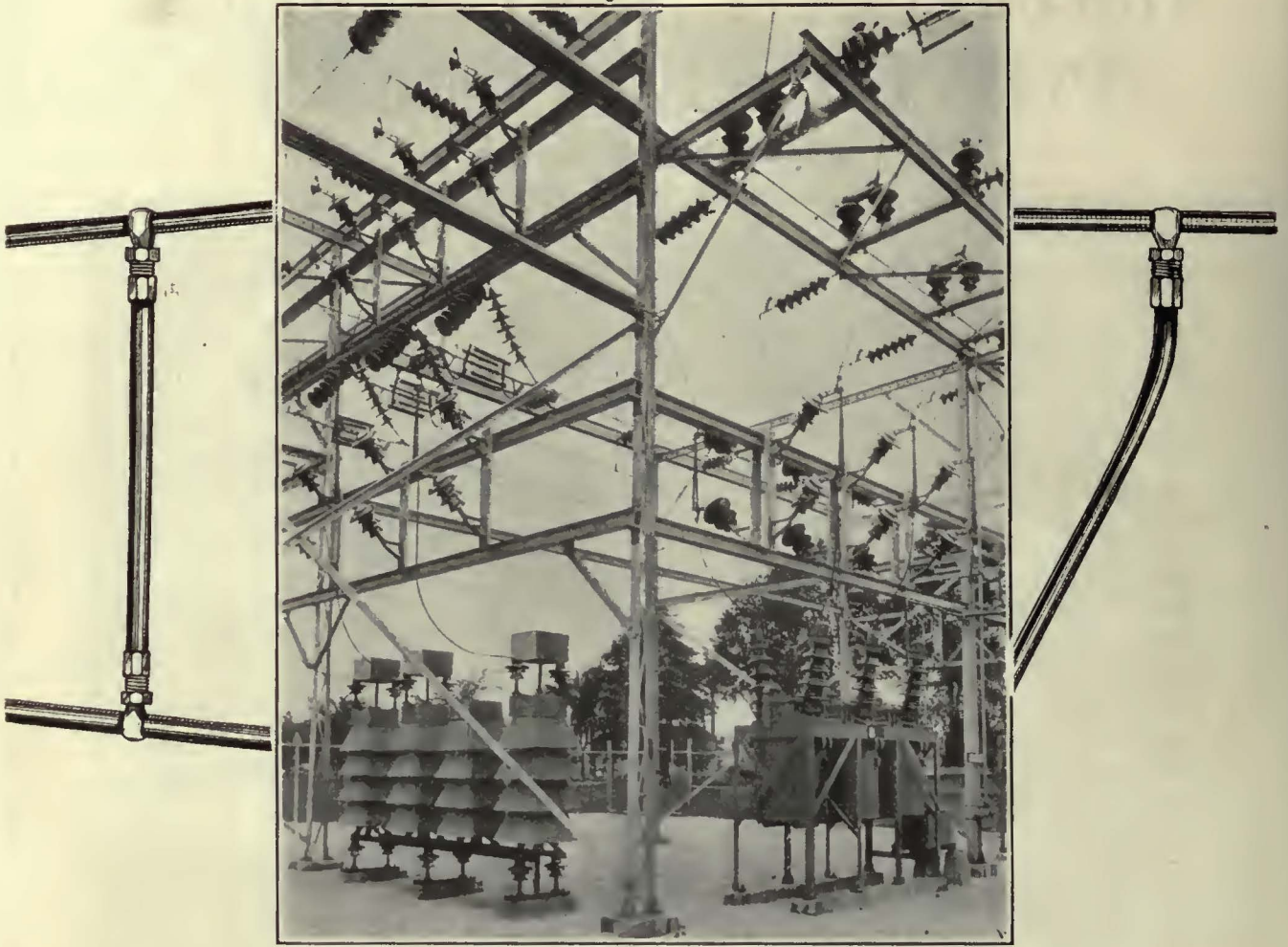
## American Brown Boveri Electric Corporation

Plants at Camden, New Jersey

Main Office: 165 Broadway, New York



## Note the Dosserts



### 33,000 Volt Automatic Sub-Station of the Toledo Edison Company

Dosserts are of course the standardized method of connections in the power plants and substations of central stations and electric railways.

The Toledo Edison Company uses Dosserts also on its 23,000 and 66,000 volt outdoor substations.

There are more than a thousand types, sizes and combinations shown in the Dossert 20th year book.

*Write for copy.*

DOSSERT & CO.

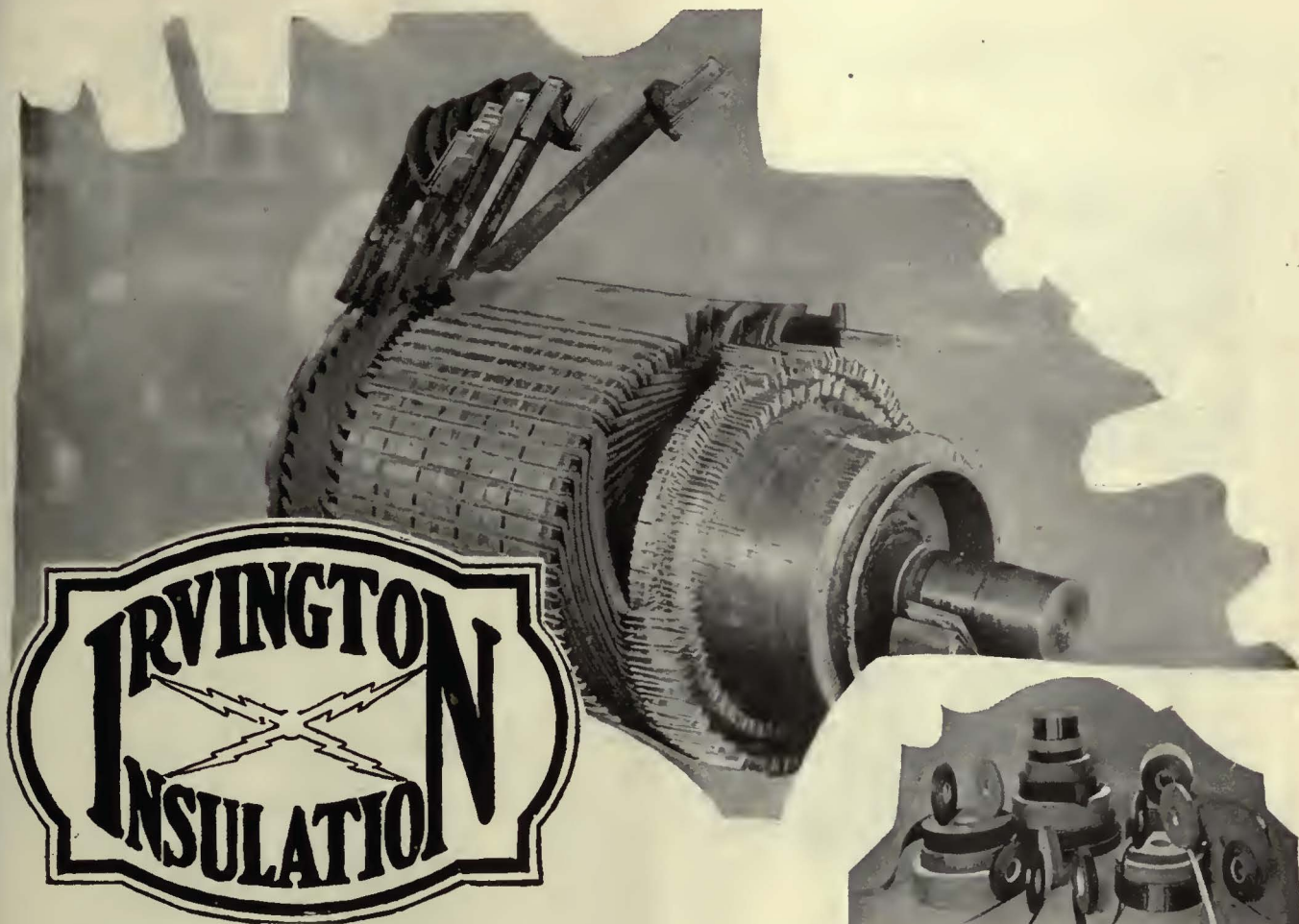
H. B. Logan, Pres.

242 West 41st St., New York

# DOSSERT

## SOLDERLESS CONNECTIONS





## —for positive protection

For more than twenty years Irvington Insulating Products have been specified by leaders in the electrical industry. They are recognized in most shops as "The World's Standard."

Having built up business on a basis of high quality—the Irvington Varnish & Insulator Company is today the largest producer in the world of flexible varnished insulations.

If you are not already familiar with our line of products, ask for samples to try in your shop—also for our 64-page book on Irvington Insulation.

**Black and Yellow**  
**Varnished Silk, Varnished Cambric, Varnished Paper**  
**Irv-O-Slot Insulation      Flexible Varnished Tubing**  
**Insulating Varnishes and Compounds**

**Irvington Varnish & Insulator Co.**  
**Irvington, N. J.**

*Sales Representatives:*

Mitchell-Rand Mfg. Co., New York  
 T. C. White Electrical Supply Co., St. Louis  
 E. M. Wolcott, Rochester  
 Martin Woodard, Seattle

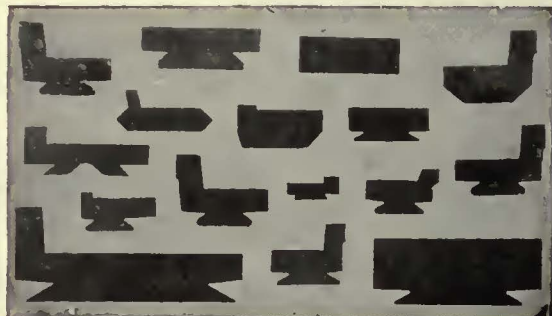
Prehler Bros., Chicago  
 Consumers Rubber Co., Cleveland  
 Clapp & Lamoree, Los Angeles  
 F. G. Scofield, Toronto



### Seven factors of Quality

- High Dielectric Strength
- High Resistance
- Flexibility
- Non-Hygroscopic
- Heat Resisting
- Chemically Neutral
- Maximum Elasticity





Micanite Commutator Segments



Micanite Commutator Rings



Empire Oiled Cloth



Armatite for Slots—2 Insulations in 1



# QUALITY INSULATIONS

UNFAILINGLY DEPENDABLE

ALWAYS UNIFORM IN QUALITY

FOR OVER 30 YEARS

WRITE FOR A COPY OF THIS HELPFUL BOOKLET

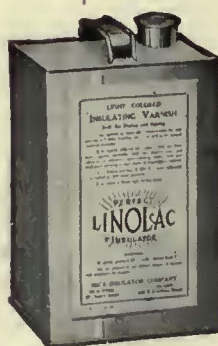
"Commutator Insulation and Assembly" is a booklet of practical and helpful information especially prepared for motor repairmen.

It describes the most up-to-date and experience-proved methods of insulating and assembling commutators and, in addition, commutator troubles and how to best overcome them.

### MICA INSULATOR COMPANY

*Sole Manufacturers of Micanite*  
Established 1893

New York Office: 68 Church St.  
Chicago Office: 542 So. Dearborn St.  
Works: Schenectady, N. Y.  
Canadian Office: Victoriaville  
*Representatives in Principal Cities*









# ALUMINUM

## CAR STRUCTURE

High-strength aluminum alloys are furnished in the form of sheet, sand- and die-castings, permanent-mold castings, tubing, rivets, moulding, etc.

The use of high-strength aluminum has in some cases reduced first-cost and has always rendered reduced weight with consequent savings in haulage. Rust cannot harm its continued good appearance.

## A. C. S. R.

Aluminum Cable, Steel Reinforced, is remarkable for its lightness, strength and great reliability in service. Having a large proportion of steel, it is the ideal material for a main catenary or messenger cable because it combines the functions of messenger and feeder in one cable.

In A.C.S.R. the aluminum strands provide the necessary electrical conductivity and give the steel core positive and permanent protection against corrosion.

## CONDUIT

Its weight is about  $\frac{1}{3}$  that of ordinary metal conduit. The 1 in. size weighs only .6 lbs. per ft.; the  $\frac{1}{2}$  in. size only .3 lbs.

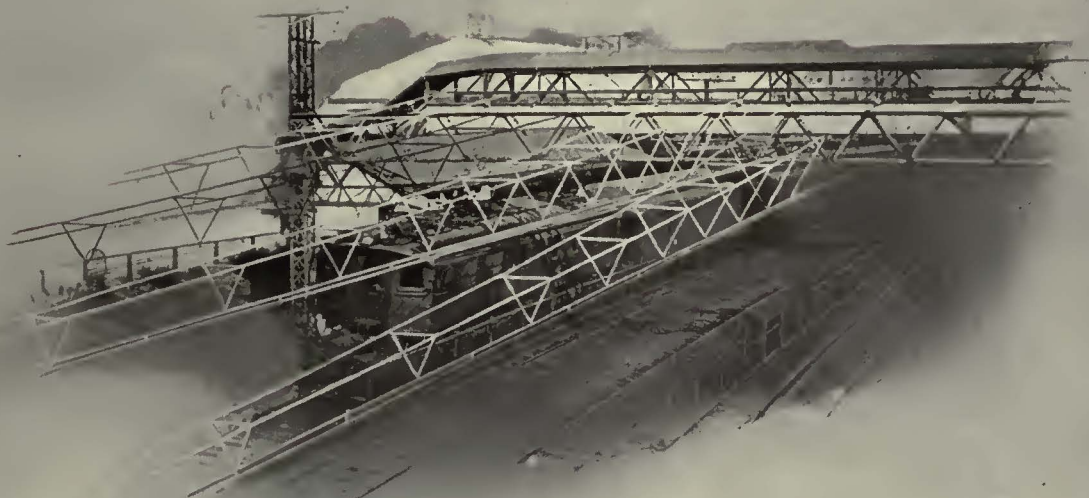
Cars in service along the seaboard, or where chemical fumes corrode other metals, should be fitted with aluminum conduit, not only for lightness, but for length of life. Aluminum is unusually resistant to common corrosive agents, and its length of service under severe conditions is responsible for its satisfactory use.

*Booklets sent on request cover Strong Alloys, Conduit, Radio, Casting Alloys, etc. Please mention the field in which you are interested.*

**ALUMINUM COMPANY OF AMERICA**  
OLIVER BUILDING, PITTSBURGH, PENNA.

*Makers of Aluminum in Every Commercial Form*





# Where *Service* is most *Exacting*

Where traffic is heavy much longer service can be obtained by the use of "Hitenso A" Trolley Wire. 3/0 B & S Grooved has a tensile strength of 60,000 lbs. per square inch and a conductivity of 80%. It meets and exceeds the requirements of the A. S. T. M. specifications for 65% conductivity high strength bronze.

Because quality means economy in equipment upkeep, it pays to use "Hitenso A".



#### WIRE PRODUCTS

Copper Wire  
Solid or Stranded  
Bare, Weatherproof  
and Slow Burning

Varnished  
Cambric Cable  
Lead and Braid Covered

Paper Lead Cable  
Trolley Wire  
Copper and Hitenso

ANACONDA COPPER MINING CO.  
THE AMERICAN BRASS COMPANY

Rod, Wire and Cable Products

General Offices: 25 Broadway, New York

Chicago Office: 111 W. Washington St.

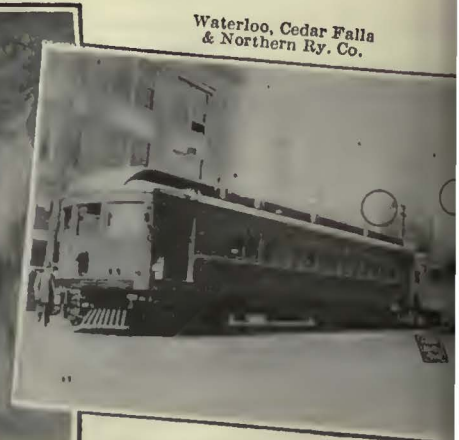
# ANACONDA TROLLEY WIRE



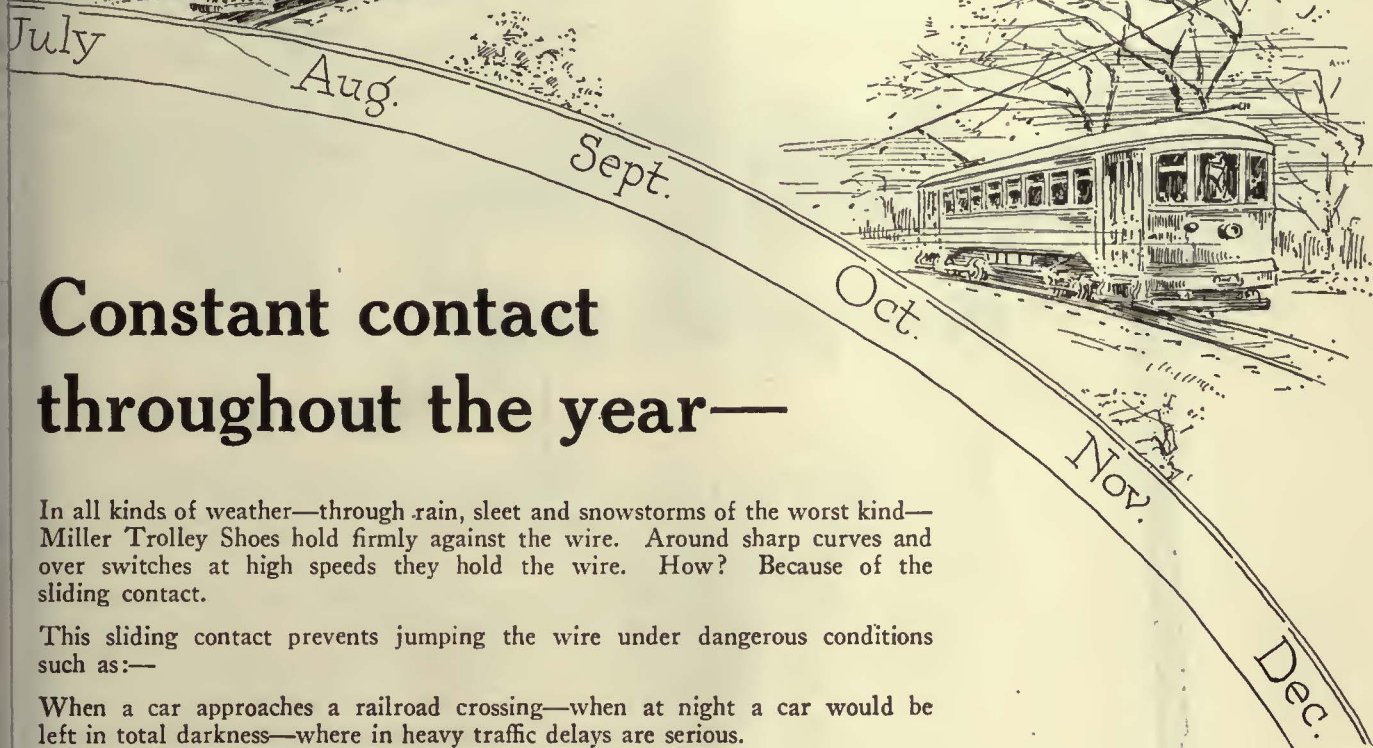


# Miller Trolley Shoes

Pacific-Northwest Traction Co.







# Constant contact throughout the year—

In all kinds of weather—through rain, sleet and snowstorms of the worst kind—Miller Trolley Shoes hold firmly against the wire. Around sharp curves and over switches at high speeds they hold the wire. How? Because of the sliding contact.

This sliding contact prevents jumping the wire under dangerous conditions such as:—

When a car approaches a railroad crossing—when at night a car would be left in total darkness—where in heavy traffic delays are serious.

Among the many advantages of this sliding contact are the fact that it reduces noise, reduces wire wear, prevents arcing, and increases the amount of current drafts efficiently handled.

As indicated by the illustrations shown below, many well-known roads are now using Miller Trolley Shoes.

*Investigate the economies and safety features of these shoes as applied to your road.*

## Miller Trolley Shoe Company

295 Columbia Road  
Boston 21, Mass.

Hudson Valley Ry. Co.



Chicago, North Shore.  
Milwaukee R. R.



Portland-Lewiston  
Interurban







## Good Retrievers never fail—

When a hunter hits a bird in full flight he must rely on his retriever to bring the bird in. Likewise after the trolley has jumped the wire the operator of a speeding electric car must rely on the retriever to pull the pole in.

The hunter depends on his favorite hound—the railway operator on an Earll.

Neither retriever fails.

## Five points that hit the mark—

Earll Trolley Catchers and Retrievers have five points of superiority which make them sure performers under all conditions.

1. No-Wear check pawl—short, simple and sturdy—always engages full face on, never strikes point of teeth.
2. Free winding tension spring handles wet rope just as easily and efficiently as dry.
3. Ratchet wind simplifies retriever winding, saves time and trouble.
4. Emergency release permits of trolley being run up again instantly at any speed in case of emergency.
5. Perfect and automatic lubrication of every part through one oil hole once in three months.

*Ask for a sample catcher or retriever. Then you can test it under your own conditions.*

# EARLL

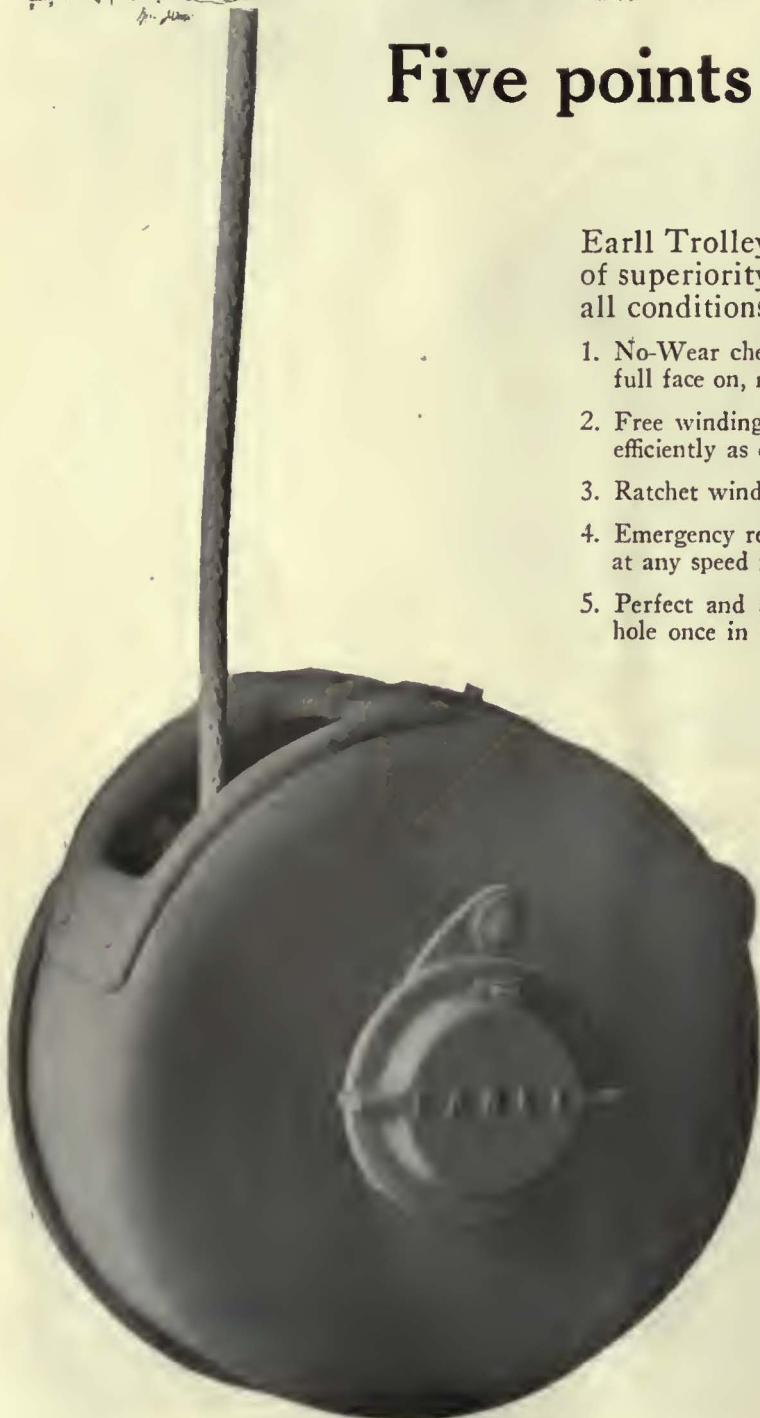
## Trolley Catchers and Retrievers

*Light-weight  
Quick-acting  
Simple*

**C. I. EARLL, York, Pa.**

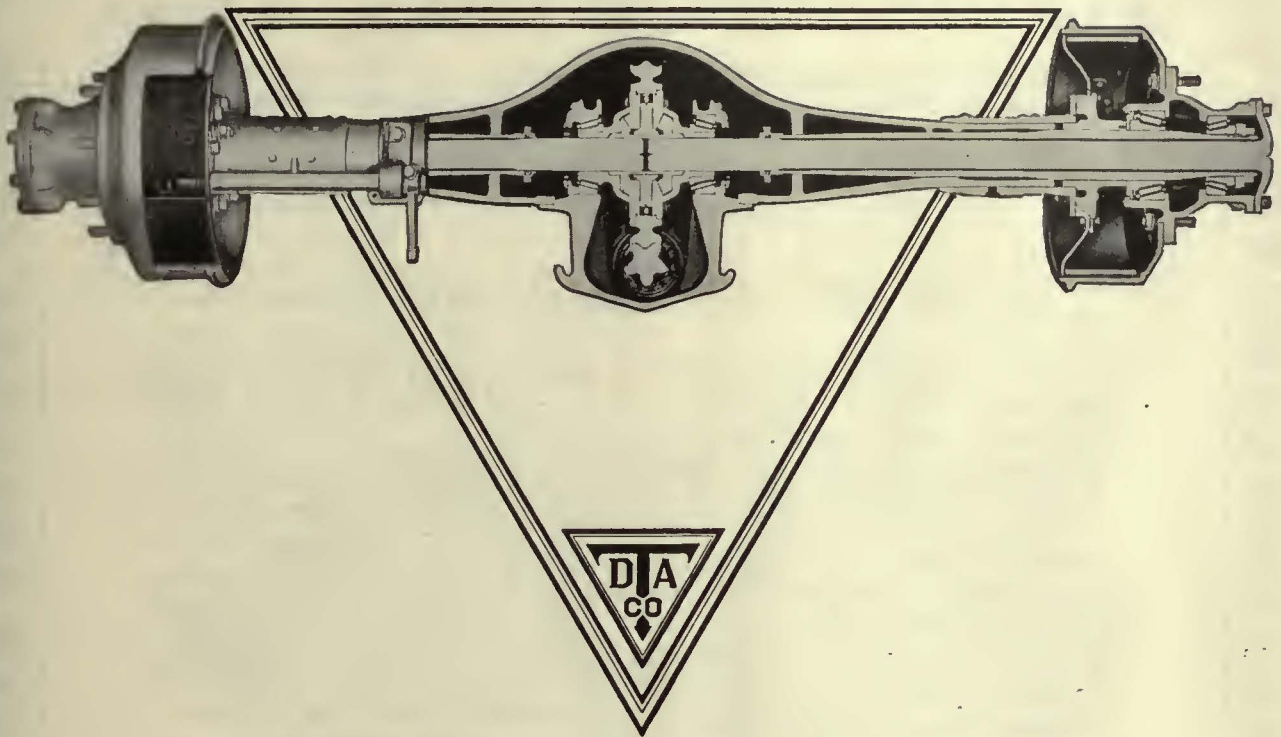
*Canadian Agents:*

Railway & Power Engineering Corp., Ltd., Toronto, Ont.  
In All Other Foreign Countries:  
International General Electric Co., Schenectady, N. Y.





# TIMKEN



Quality is the result of honest effort backed by long experience and ample resources.

Good Will is the result of Quality — and, once acquired, represents so great an expenditure of time and money that good business dictates it must forever be maintained.

(30)

---

THE TIMKEN-DETROIT AXLE COMPANY, DETROIT, MICHIGAN

# AXLES



# SHULER

## FRONT AXLES

From the very beginning, through many years of successful service to manufacturers, all the efforts of the Shuler organization have been concentrated upon the development and perfection of only one major unit—the Front Axle.

We realize that there is no major part more vital to the safety of any motor vehicle and its human or material freight, than the part we have chosen to make.

Appreciating the responsibility we assume, we have made a most careful study of the requirements in every field of Front Axle service which we have entered and have cooperated to the fullest degree with the manufacturers. Combining their ideas and experience with ours, we have developed our designs to meet their particular demands.

It is only logical and inevitable that such specialization in engineering and manufacturing, and such cooperation between manufacturer and parts-maker, should produce a distinctly superior Front Axle which would meet every emergency and which would serve with equal assurance of safety and efficiency.

We are the originator and pioneer manufacturer of a Front Axle specially designed for motor bus service—an axle now specified by the foremost designers and used by the leading manufacturers—a product that any manufacturer can stand behind and guarantee as if it were made in his own plant and under his own supervision.

We offer a complete line of Front Axles for motor busses, motor trucks, tractors and trailers, embodying maximum efficiency in the product and real service in the factory behind it.

*Our representatives, at the Vanderbilt in New York and at the Blackstone in Chicago, will be glad to talk with manufacturers regarding their 1926 requirements,—placing at your disposal all our resources and experience, and the complete cooperation of our engineering staff.*

**SHULER AXLE COMPANY, Incorporated**

3019 Jones St., Louisville, Ky., U. S. A.





Better finish in less time!

# Nitro-VALSPAR

PRIMER

GUNGLAZE

ENAMEL

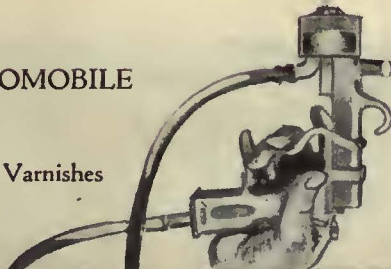
NO WEAK LINK

Nitro-Valspar Means  
 Faster Finishing  
 Every Coat  
 Lacquer  
 You Save  
 Time  
 Money  
 and  
 Space

!

VALENTINE'S AUTOMOBILE  
FINISHES

Nitro-Valspar—Valentine's Varnishes  
Valspar-Enamels



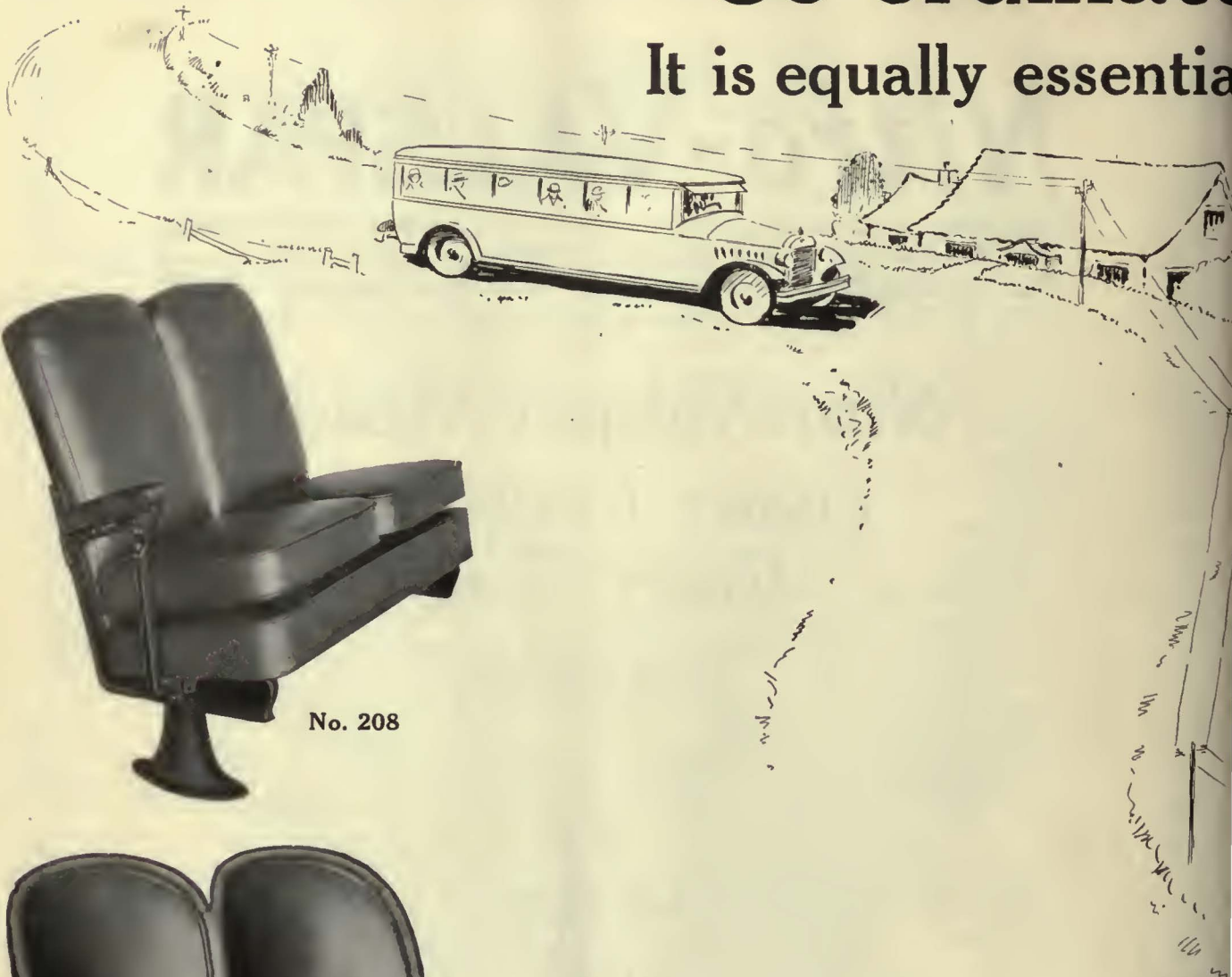
VALENTINE & COMPANY

*Largest Manufacturers of High-Grade Varnishes in the  
World—Established 1832*

New York—456 Fourth Ave. Boston—49 Purchase St.  
 Chicago—343 South Dearborn St.  
 Detroit—10-254 General Motors Bldg.  
 W. P. Fuller & Co., Pacific Coast



# Co-ordinate It is equally essential



No. 208



No. 900A

### Typical Bus Seats

No. 208—De Luxe with divided back, spring cushion and air-cushion pads.

No. 900A—Double Chair with individual back and spring cushion pads.

### Typical Car Seats

No. 392EE—With mahogany capped armrest, and extra high three-part headroll.

No. 199F Special—Plush seat with thickly upholstered spring edge cushion and detachable back.

**Hale and Kilburn SEATS**



# Comfort!

## both bus and car

Co-ordinated comfort, as represented by Hale-Kilburn Seats, is now available for both cars and buses in every type of service — urban, suburban and interurban.

With a half century of experience in the design of comfortable, practical seats for railway cars as a background, Hale-Kilburn now offers an equivalent line of bus seats which are rapidly becoming standard equipment in this new field of transportation.

*Your request will bring a copy of our catalog —also prices if desired.*

### HALE-KILBURN COMPANY

*General Offices and Works:*

**1800 Lehigh Avenue, Philadelphia**

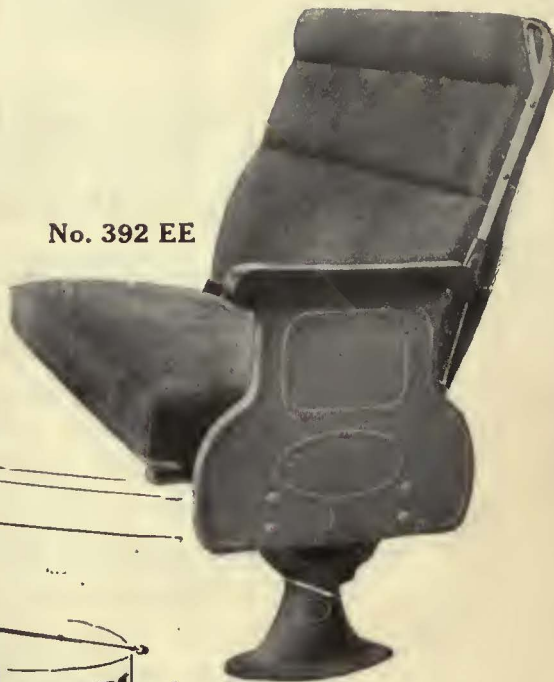
**SALES OFFICES:**

Hale-Kilburn Co., 30 Church St., New York  
Hale-Kilburn Co., McCormick Bldg., Chicago  
Equipment Sales Corp'n, Railway Exchange Bldg., St. Louis  
E. A. Thornwell, Candler Bldg., Atlanta  
Frank F. Bodler, 903 Monadnock Bldg., San Francisco

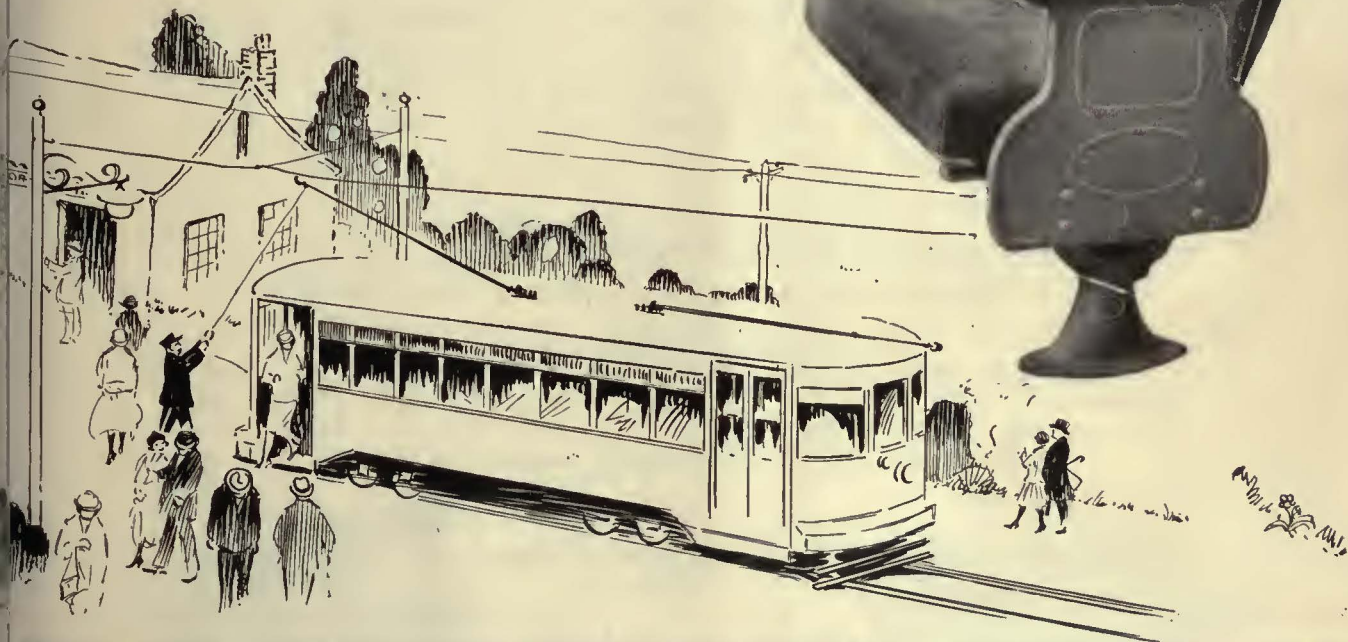
Chris Eccles, 320 S. San Pedro St., Los Angeles  
T. C. Coleman & Son, Starks Bldg., Louisville  
W. L. Jefferies, Jr., Mutual Bldg., Richmond  
W. D. Jenkins, Praetorian Bldg., Dallas, Texas  
W. D. Jenkins, Carter Bldg., Houston, Texas  
H. M. Euler, 46 Front St., Portland, Oregon



**No. 199F  
Special**

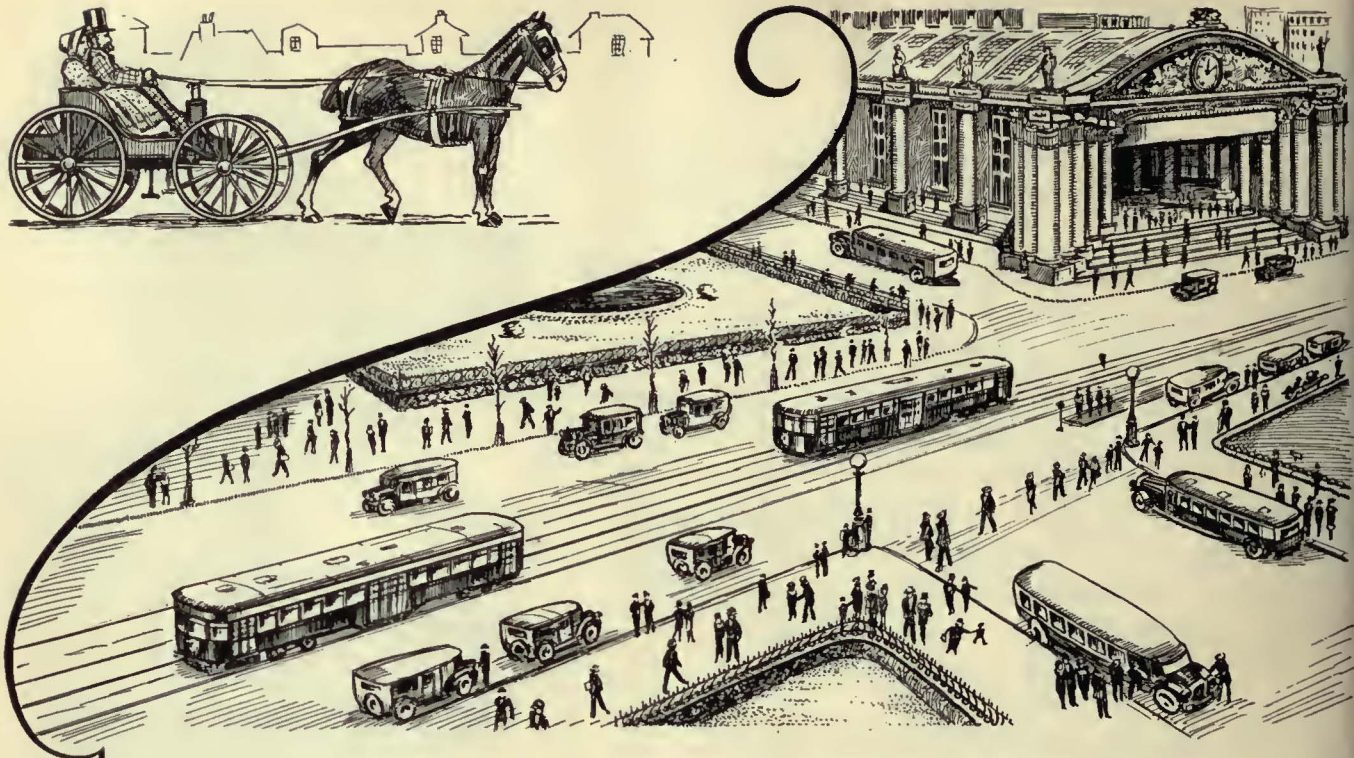


**No. 392 EE**



# Hale and Kilburn SEATS





## From the early days of the buggy to modern railway cars and buses

Just as the old-time horse and buggy has been replaced by the automobile, the bus and the electric railway car, so have the requirements of finish changed. To be satisfactory and economical, the finish on a bus or railway car must not only be pleasing in appearance but it must be *permanent*—modern transportation requirements demand it.

More and more railway and bus companies are coming to realize that Egyptian Lacquer gives a finish that is both beautiful and permanent and at the lowest cost. Can be easily applied in successive hourly periods.

Consider what this means in your overhead, in the running time of your cars, in the maintenance costs—in your profits—

*We have manufactured lacquers exclusively for 50 years  
and are at your service.*

**The EGYPTIAN LACQUER MFG. CO.**

90 West St., New York

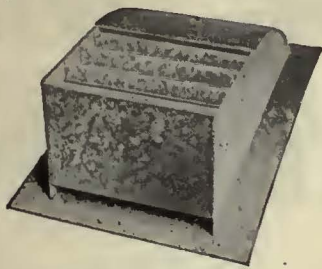
Chicago

Los Angeles

San Francisco

# EGYPTIAN LACQUERS





Type "A" for Street Cars

*For cars having a small roof radius. Made entirely of Armo galvanized sheet iron. Weight 6½ pounds. Like all N-L's absolutely noiseless, dust and weather proof.*



Type "C" for Street Cars

*Especially applicable to cars having a large roof radius. Lies low on roof. Made entirely of Armo galvanized sheet iron. Weight 6 pounds.*

## There's room in the passages for the exhaust

N-L water baffles do just what they're intended to do...they prevent the entrance of rain and storm. But their superiority lies in the fact that they do not choke up the air passages. Which accounts for the surprisingly high exhaust of N-L Ventilators.

### THE NICHOLS-LINTERN CO.

7960 Lorain Avenue

Cleveland, Ohio

Represented in Canada by: Railway & Power Engr. Corp., Toronto, Ont.  
 In Great Britain by United Automobile Services, Ltd., Lowestoft, England  
 In Australia, South Africa and Orient by: Nolan Smith & Co., Ltd., New York City



The "Dual" for Buses

*The most powerful roof ventilator made. Regulative feature provides control to meet any weather condition. The only genuine year-round performer. Height when closed 1½-in., when fully opened 4½-in. Weight 4 pounds.*



The "Aerating" for Buses

*Similar to the "Dual" but relies entirely upon interior grill for regulation. Very high exhaust rate. Height above roof, 1½-in. Like the "Dual" designed for low clearance. Weight 2¾ pounds.*



# The Car [and Bus of Tomorrow -the profit-making type will be largely built HASKELITE and PLYMETL because

## Recent Installations of CARS and BUSES using HASKELITE Products

### CUSTOMERS AMONG STREET RAILWAYS

Chicago, North Shore & Milwaukee Ry. Co., Milwaukee, Wis. Cars built by Cincinnati Car Co. with HASKELITE headlinings and interior linings. HASKELITE ordered 9-15-25 for interior headlinings on street cars. Use HASKELITE for side panels and front and rear letter boards. Building cars with HASKELITE exterior side panels. 5-18-25. HASKELITE ordered 9-18-25 for repair work.

Denver Tramways, Denver, Colo. PLYMETL used for side linings and HASKELITE for car seat bottoms. PLYMETL ordered 9-19-25 for repair work.

Fort Smith Light & Traction Co., Fort Smith, Ark. HASKELITE used for headlinings. Reconditioning old cars into DeLuxe type. HASKELITE used for interior trim. 4-8-25.

Milwaukee Elec. Ry. & Light Co., Milwaukee, Wis. HASKELITE 10-27-25 for inside finish of parlor cars and coaches. PLYMETL used for vestibule linings. PLYMETL 10-1-25, 10-14-25 for exterior side panels of cars.

Pine Bluff Co., Pine Bluff, Ark. 100 cars with HASKELITE headlinings built by the Pressed Steel Car Co. 225 cars with HASKELITE headlinings and bulletin boards built by the Pressed Steel Car Co.

Pittsburgh Railways, Pittsburgh, Pa. 103 cars built by Osgood-Bradley with HASKELITE headlinings and hoods. 1925—Have over 500 HASKELITE cars in operation.

United Traction Co., Albany, N. Y. PLYMETL 8-14-25 for re-building car. PLYMETL 10-9-25 to be used for the sides of their 180 type cars in place of sheet steel.

Buffalo Erie Ry. Co., Erie, Pa. 14 cars built by Cincinnati Car Co. with HASKELITE interior linings and headlinings.

Chicago, Lake Shore & South Bend Ry. Michigan City, Indiana. Have cars with HASKELITE ceilings. Rebuilding cars with HASKELITE linings, 4-9-25.

Grand Rapids St. Ry. Co., Grand Rapids, Mich. Use HASKELITE for roofs, headlinings, and interior linings. In April, 1925, had three sample cars built — one by Light Weight Noiseless Car Co. with HASKELITE roof, exterior side and end panels, linings and headlinings; one by the G. C. Kuhlman Car Co. with HASKELITE roof and PLYMETL sides, and another car by the St. Louis Car Co. with HASKELITE roof. EVE PLYMETL 9-8-25 for repair work.

Indiana, Columbus & Eastern Trac. Co., Springfield, Ohio. Cars with HASKELITE roofs built by G. C. Kuhlman Car Co. Standardize on HASKELITE headlinings.

Municipal Railways of San Francisco, San Francisco, Calif. HASKELITE used for roofs of cars built by Bethlehem Shipbuilding Corp., Los Angeles, Calif., and American Car Co., St. Louis, Mo.

### BUS BODY INSTALLATIONS

Boston Elevated Railway, Boston, Mass. Operate 49 Mack buses. HASKELITE roofs. Three Yellowa with HASKELITE headlinings 25 International Harvester with HASKELITE roofs.

Boston & Worcester Street Railway, Framingham, Mass. Five International Harvester buses with HASKELITE roofs. Five Mack buses with HASKELITE roofs.

Cleveland Railway, Cleveland, Ohio. Twelve Yellow Coach buses with HASKELITE headlinings. Thirty buses built by G. C. Kuhlman Car Company with HASKELITE roofs and PLYMETL sides. Fifty buses built on six wheel chassis with HASKELITE roofs, headlinings, floors, seats and interior lining.

Connecticut Company, New Haven, Conn. Total 80 buses. Have a fleet of Mack buses with HASKELITE roofs. HASKELITE also used in the body. 12-23-24 Sept., 1925, purchased 13 Street Car type buses from Yellow Coach, HASKELITE roofs and headlinings.

Kansas City Railway, Kansas City, Mo. Ordered 56 new buses, 38 being built by American Car Co. with HASKELITE roofs, headlinings and side linings. 18 being built by St. Louis Car Co. with HASKELITE roofs, headlinings and side linings.

Milwaukee Elec. Ry. & Light Co., Milwaukee, Wis. Bodies mounted on Yellow, Mack and Six-Wheel chassis. Operate 3 type "Y" Yellow Parlor Coaches with HASKELITE headlinings, ad racks and rear corners. Also 15 single deck buses with HASKELITE headlinings.

Mississippi Power & Light Co., Jackson, Miss. Bought 40 buses with HASKELITE headlinings, 6-26-25. Using HASKELITE for interior of parlor cars built in own shop. 10-13-25.

Philadelphia Mutual Transit Co., Philadelphia, Pa. 7 buses built by Fageol with HASKELITE roofs and linings. Purchased 225 buses from Yellow Coach 150 of which are double-deckers with HASKELITE floors on upper deck and HASKELITE half roofs on upper deck. 75 are single-deckers with HASKELITE one-piece headlinings. HASKELITE 9-25-25 used for repairs.

Toronto Transportation Commission, Toronto, Ont., Canada. April 1, 1925—21 buses built by Yellow Coach Mfg. Co., with HASKELITE roofs and headlinings. Also operate buses built in own shops with HASKELITE roofs and PLYMETL sides. Built 3 coaches in their own shop with HASKELITE mahogany panels.

Chevy Chase Coach Line, Washington, D. C. 6 parlor car special buses from Yellow Coach HASKELITE roofs and headlinings.

Details regarding many other Car and Bus installations recently made will be sent you upon request.



# HASKELITE PLYMETL

Replaces heavier materials for roofs, headlinings side linings, bulkheads, interior trim and sub floors. It comes in single panels, as large as 23 by 9 feet, in various thicknesses, and for interior trim it is supplied with top ply of mahogany or walnut. Car roofs are formed of from three to five panels, with or without headlinings. Bus roofs are commonly made of single panels. By using Haskelite, the weight of a double truck car is reduced as much as 900 pounds. Wherever Haskelite is used, strength is increased, weight decreased, and time and labor expense is greatly reduced.

Replaces sheet metal for exterior panels on cars and buses, with a marked reduction in weight. Plymetl resists indentation more effectively than steel, takes a high quality of finish with fewer paint coats. It has many times greater resistance to heat and cold, than sheet steel, and is used for side panels on many types of cars and buses without inner linings. Plymetl is furnished in large panels, is easily worked and can be bent to curves of moderate radius in common tinner's rolls. It can be screwed or glued to wooden frames, or hot riveted to steel. Plymetl resists buckling more effectively than sheet steel, and its use in side panels or, as in some cases as sub-floors, materially stiffens the car body while reducing weight.

Plymetl used on a double truck car saves as much as 900 pounds.

*they make possible a form of construction especially suited to the demands of the new day*

URBAN and interurban passenger transportation is on a decidedly different basis today than heretofore. The public is more critical and exacting yet is appreciative of improvements when they are made. Operating expenses must be reduced, revenues must be increased. The answer is more attractive, comfortable, and lighter weight cars and buses. The light weight car has become established as a means of reducing operating and maintenance expense. It also effects an increase in revenue by making possible better schedules and more trips.

Haskelite products, HASKELITE and PLYMETL, played a large part in making possible the modern light weight car and motor coach. They are furnished in single pieces of large area, thus reducing the number of joints — especially in roofs — and minimizing the labor of placing. Their outstanding characteristics of strength and light weight make them ideal materials for car and bus body construction. Their heat insulation value makes inner linings unnecessary in many cases, and the ease with which they can be given a high quality finish contributes much to the attractiveness of the vehicle. Operating companies having experience with Haskelite and Plymetl are specifying them for new cars. Builders of both cars and buses are standardizing on the use of Haskelite and Plymetl. Builder or operator — cars or buses, you will profit most under today's conditions by utilizing Haskelite and Plymetl transportation's dominant construction materials.

**HASKELITE MANUFACTURING CORPORATION**  
133 WEST WASHINGTON STREET  
CHICAGO, ILLINOIS





Moran Patent Transfer



# Statistics Show that—

you can stop revenue losses due to transfer abuse by using the Moran Patent Transfer. Time limits are accurately fixed by tearing off the perforated coupons. A.M. and P.M. are instantly detected by using contrasting colors. Conductors can quickly issue and receive these transfers without making errors.

## GLOBE

### Tickets—Transfers—Passes

—of every description are designed by our specialists for all standard and special requirements.

Ask us to show you what we have done for others in the past—and what we can do for you in 1926.

### GLOBE TICKET COMPANY

116 N. 12th Street, Philadelphia, Pa.

Los Angeles

New York

San Francisco





100 · YEARS · OF · MANUFACTURING · EXPERIENCE ·



No. 325-S.C. Spl.

No. 55-P

## Comfortable *H-W* Car Seats Adapted to New or Renewal Equipment

THE demand for more attractive and comfortable Electric Railway seating equipment has been met in a practical way by Heywood-Wakefield car-seating engineers. Through improvements in appearance and construction, the H-W line has kept pace with the popular trend in modern car equipment.

The two seats shown are fine examples of the new reversible and non-reversible types of electric car seats. They represent what can be done in the re-seating of out-of-date equipment and the proper seating of the new.

No. 325-S. C. Special embodies luxurious comfort with unusually fine appearance. Seat and back are scientifically pitched for easy posture. Seats are of double, and backs of single spring construction. Upholstery may be of plush or genuine leather, as desired. Backs come 22 or 25 inches in height, with or without head-roll. Arm rests can be supplied.

Heywood-Wakefield seating experts, backed by 100 years' manufacturing experience, have given careful study to the new order of things in Electric Car seating. They are qualified to help you in many ways in the rehabilitation of your rolling stock. This consulting service is available to you without charge through any H-W sales office.

Stocks of Snow Sweeper Rattan and Car Seat Webbing are maintained, ready for immediate shipment from points listed below.

# Heywood-Wakefield

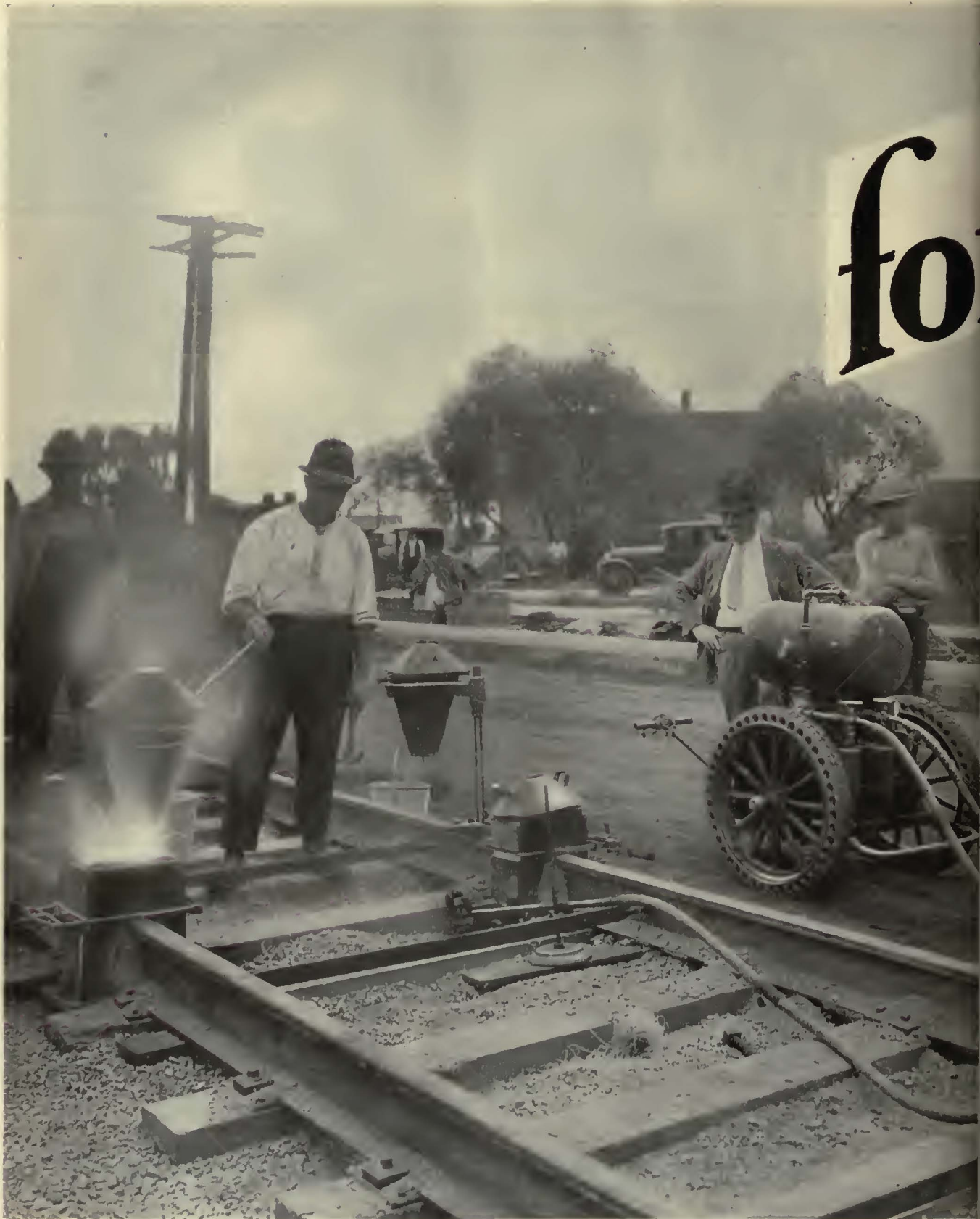
REG. U.S. PAT. OFF.

### HEYWOOD-WAKEFIELD SALES OFFICES

HEYWOOD-WAKEFIELD COMPANY  
516 West 34th St., New York, N. Y.  
HERBERT G. COOK  
Hobart Bldg., San Francisco, Cal.  
THE G. F. COTTER SUPPLY CO.  
Houston, Texas

HEYWOOD-WAKEFIELD COMPANY  
1359 Railway Exchange Bldg., Chicago, Ill.  
F. N. GRIGG  
630 Louisiana Ave., Washington, D. C.  
THE RAILWAY & POWER ENGINEERING CORP.  
Montreal, Toronto and Winnipeg, Canada





**METAL & THERMIT**

PITTSBURGH

CHICAGO

BOSTON

120 BROADWAY,



# a smooth quiet ride—

*the starting point is jointless track*

## THERMIT-WELDED

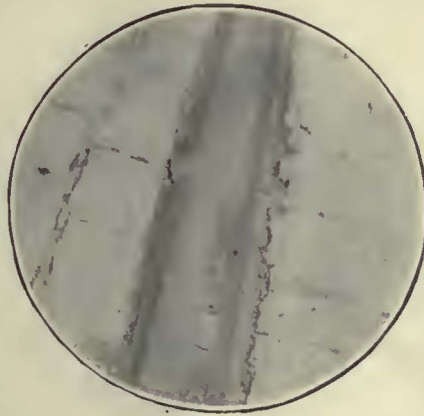
The finest street car ever built cannot roll smoothly on a rough track. The most modern noise-reducing ideas in car design will fail where broken or cupped track joints exist.

There is only one established time-tried way to overcome the bad joint troubles in track. That way is to eliminate the joints.

Thermit-welding makes solid rail, one smooth unbroken surface on which the steel wheels

roll. It automatically eliminates cupping. There is no gap for wheels to jump, because where the rail ends meet they are solidly and permanently united! The life of the track is thereafter limited only by the wearing life of the rail itself.

Your modern cars will travel more quietly, and require less maintenance themselves on Thermit-welded track.



**NO PLATES  
NO BONDS  
NO BOLTS**



It's easier and cheaper than ever to do. Ask for our proposal on your 1926 track program.

# CORPORATION

NEW YORK, N.Y.

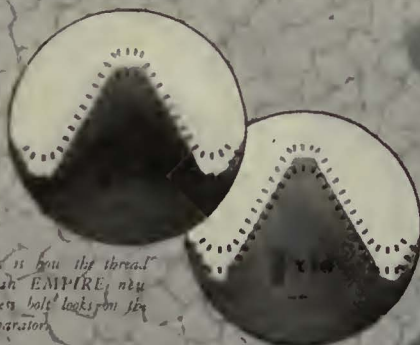
SOUTH SAN FRANCISCO

TORONTO



# EMPIRE *New Process* BOLTS

THE only difference between an Empire *New Process* bolt and a hardened and-ground gauge is that the bolt is made in a few seconds, and the gauge in a number of hours. There is no difference in fit.



*This is how the thread of an EMPIRE, new Process bolt looks on the comparator.*

*This is how the thread of a hardened and-ground gauge looks on the comparator.*



**RUSSELL, BURDSALL & WARD**  
**BOLT & NUT COMPANY**  
PORT CHESTER, N.Y.

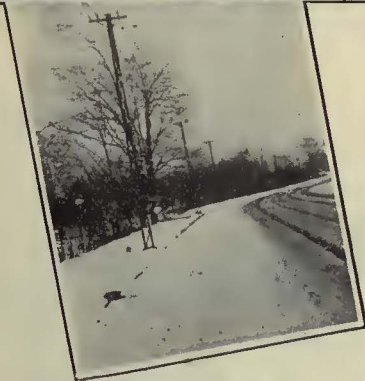


Branch Office: Stryker Building CHICAGO    Branch Office: General Motors Bldg. DETROIT    Branch Factory: ROCK FALLS, ILL.    Strimple & Gillette 174 Jackson Street SEATTLE    Maydwell & Hartwell, Inc. 148-148 Eleventh Street SAN FRANCISCO

Makers of Bolts, Nuts and Rivets Since 1845



# Bates Installations in 1926



AS IN 1925, '24, '23, and so on back through a period of many years, this year will see Bates installations made by numerous companies as a natural part of their economic construction program.

THAT—  
BATES INSTALLATIONS ARE GIVING *highly satisfactory* service in practically every country of the world, is evidenced by the fact that in a single year Bates installations were made in 40 of the 48 States of the United States and in 31 foreign countries, and the reports received indicate that these installations are satisfactorily meeting these varied requirements.

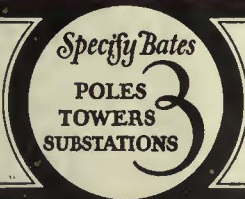
### Why This General Acceptance

This wide general acceptance of Bates Products, by so many leading companies all over the world, speaks well of the service which is being given to this branch of the electrical industry. This service merits your consideration of Bates Products when you are planning installations of poles, towers or substations.

The Bates Organization which has been an aid to others in solving their installation problems, is ready to cooperate with you.

*We take this opportunity to wish the Electric Railway Industry great progress through 1926 and the coming years.*

AN ORGANIZATION specializing on the supporting structure requirements of the electrical industries, having complete facilities for designing, detailing, fabricating and painting or galvanizing its products, all within one company.



**B**ates **E**xpanded **S**teel **T**russ **C**o.

General Offices and Plants  
EAST CHICAGO, INDIANA, U. S. A.

New York Office  
51 EAST FORTY-SECOND ST., NEW YORK, N. Y.





## Electric Railway Track Costs Are Reduced with Creosoted Ties

*"You can cut your average tie cost 30% per year through the use of a properly treated tie"*

said the superintendent of a well known street railway in an address delivered before the Mid-West Electric Railway Association in a convention at Kansas City.

Sound, creosoted ties are excellent insurance against decay. Their long life assures low annual cost, fewer tie renewals and fewer track disturbances.

The following are advantages of creosoted ties which have a direct bearing on improving service and reducing operating expenses.

**Longer Life — Durability — Easy to Maintain  
Low Annual Cost — Resilient — Noiseless**

*Your requirements can be shipped immediately from A.R.E.A. standard specification stock on hand. Order now for Spring delivery.*

**International Creosoting & Construction Co.**

General Offices—Galveston, Texas

Plants: Texarkana, Texas Beaumont, Texas Galveston, Texas


*Port Arthur Traction Co. International Creosoted Pine Ties installed in 1909 in street car service in the city of Port Arthur, Texas.*

# International HIGH GRADE CREOSOTED TIES

*Are Ready for You Now!*







# SAMSON SPOT TROLLEY CORD

Long experience has demonstrated the superior durability of this better trolley cord, its resistance to weather, due to thorough waterproofing, and its freedom from any tendency to kink or jam the retrievers. You will find it always smoothly braided and free running.

# SAMSON SIGNAL CORD

Of the same high quality. Is supplied in drab and mahogany colors. The mahogany cord is also furnished with a wire centre, if so required.

*Send for samples.*

**SAMSON CORDAGE WORKS**

Boston, Mass.



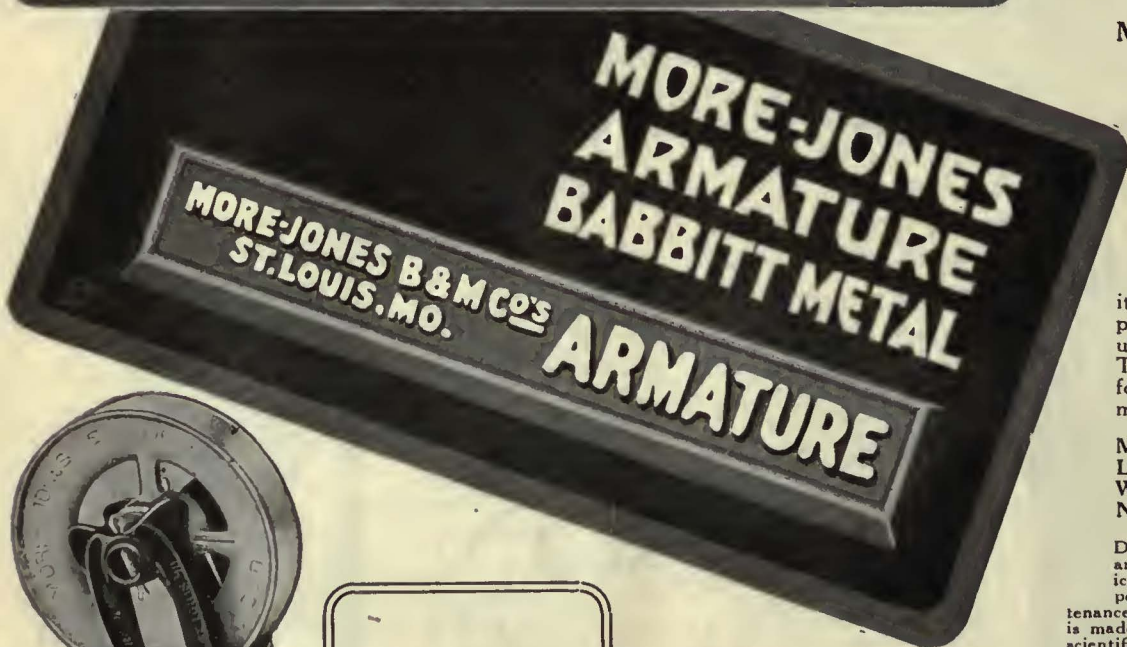




# Lib

### "Tiger" Bronze Axle and Armature Bearings

Possess in greatest degree the essential physical properties of strength, resistance to heat and a low rate of wear. They insure maximum service under the hardest operating conditions.

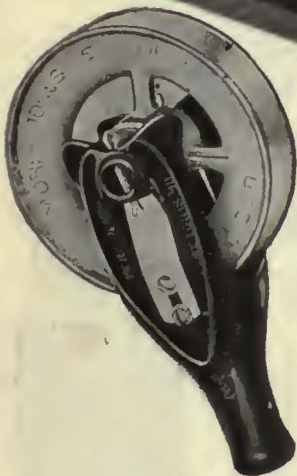


### M-J Armature Babbitt

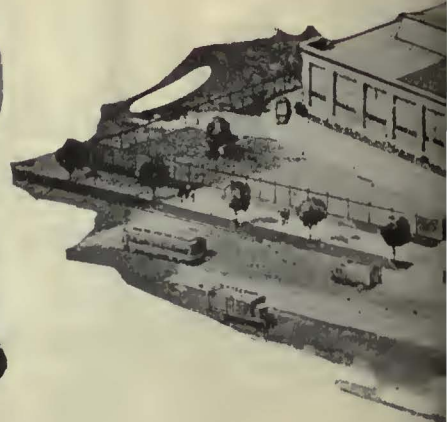
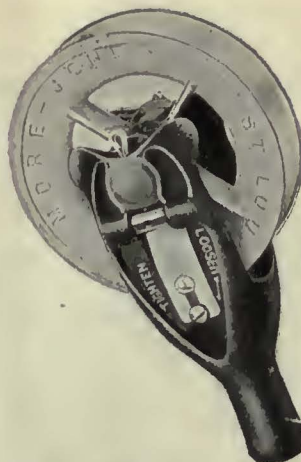
Scientifically compounded for the railway field exclusively. It is pure tin, copper, antimony and metallic nickel, alloyed to the highest degree of practical utility — not a trace of lead in it, the merit of which is proved by its widespread use here and abroad. There is nothing better for long, efficient and most economical results.

### M-J No. 10 six inch Lubricating Trolley Wheel equipped in our No. 6 Harp.

Designed for high speed city and interurban trolley service, eliminating a very high percentage of former maintenance requirements. The wheel is made of only pure new metal, scientifically designed and constructed to give a high and uniform average mileage without undue wear on the overhead. Easy to remove and replace. Current capacity greatly improved. Detailed information and prices upon request.



MORE-JONES TROLLEY WHEELS AND HARPS



# MORE-JONES QUALITY PRODUCTS

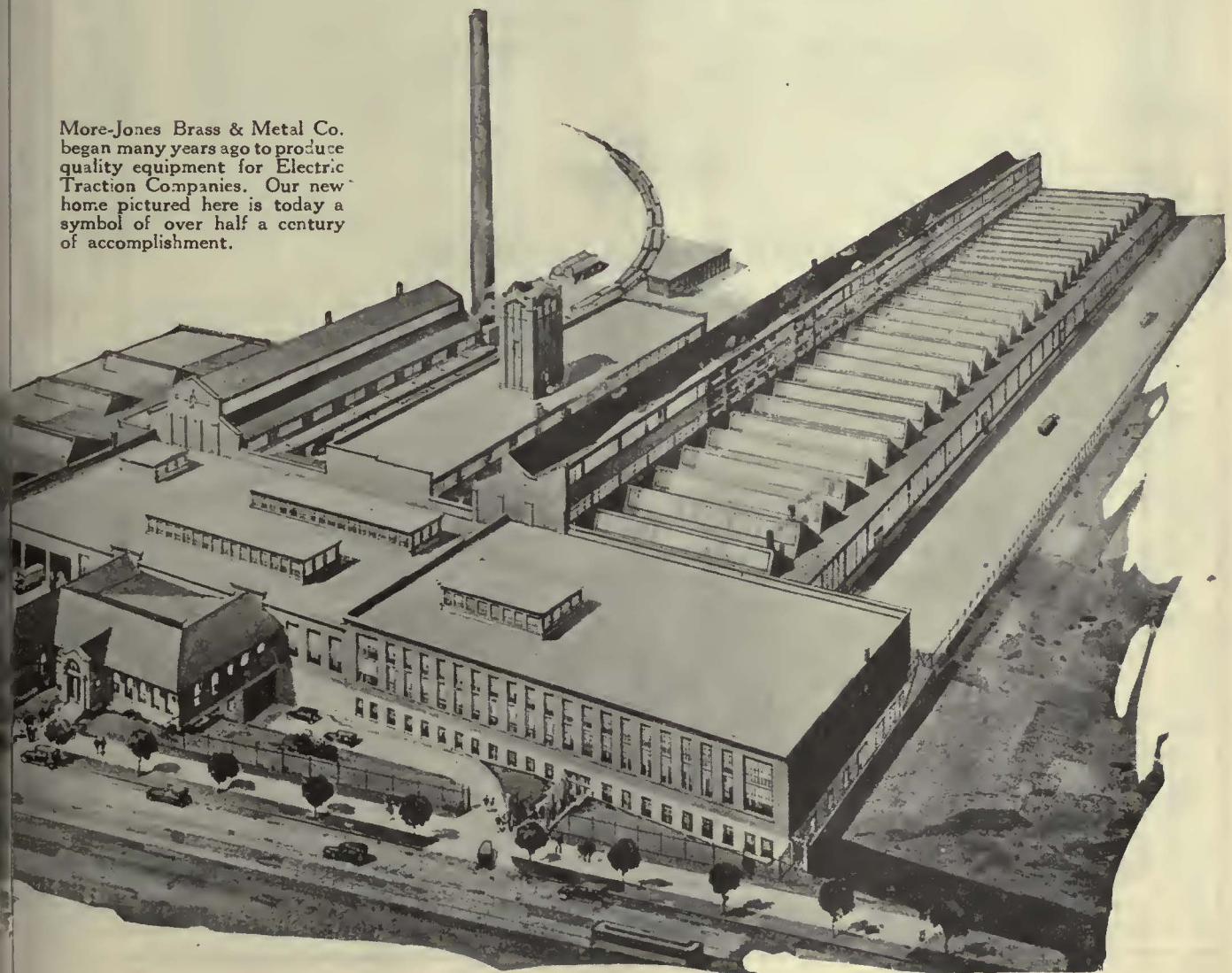


# eral Mileage per dollar invested

The facts concerning More-Jones electric railway equipment (Trolley wheels — Haiss "Tiger" Bronze Axle and Armature Bearings — M-J Armature Babbitt), are that they offer decided advantages from a service and maintenance standpoint. Figures computed over a certain period of usage of this equipment, will prove these facts. That you can obtain liberal mileage per dollar invested from these maintenance items on your trolley cars is a certainty. Let us help you solve your equipment problems. Get our prices.

**More-Jones Brass and Metal Co.**  
St. Louis, Mo.

More-Jones Brass & Metal Co. began many years ago to produce quality equipment for Electric Traction Companies. Our new home pictured here is today a symbol of over half a century of accomplishment.





## A Message to the Electrical Industry

**B**ACK of the words "Rome Wire Company" there stands an organization. One division of this organization is a department composed of engineers and chemists whose primary job is the development and improvement of Copper Wires and Cables for electrical purposes.

The information which this department has accumulated, the combined knowledge of all these men, is at the disposal of any organization using Copper Wires or Cables.



### 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
Los Angeles J. G. Pomeroy, Inc. 336 Azusa Street	Cleveland 1200 W. 9th Street San Francisco J. G. Pomeroy, Inc. 51 Federal Street



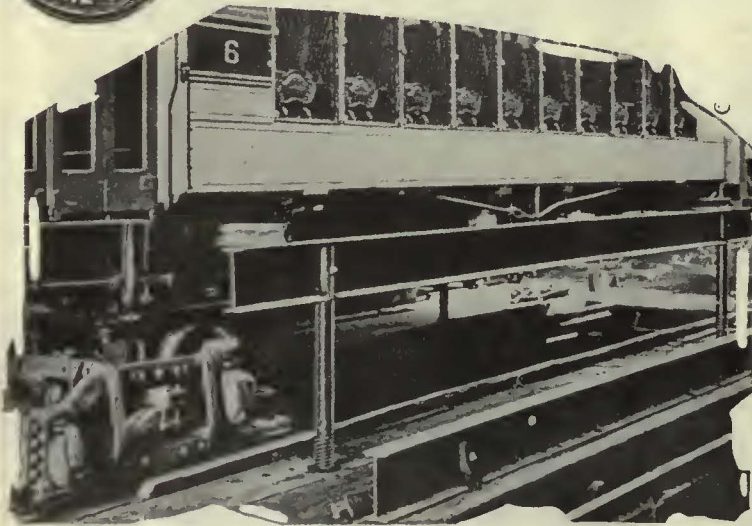


**Topping the peak for over fifty years**  
**SILVER LAKE TROLLEY CORD**

has consistently rendered super-service because of its tough, strong, waterproof and long-lasting qualities. Bell and register cords made in all sizes and colors. Ask for samples.

**Silver Lake Company, Newtonville, Mass.**





# Columbia

## Electric Car Hoists and Bus Hoists

When it is necessary to repair and inspect railway cars or buses, raise them on Columbia Hoists. Then the men can work underneath with ample freedom and plenty of light and air. At the same time other men can work around the upper part of the bus by standing on the platforms hinged to the channels on both sides.

The Car Hoist raises a 50-ton car 6 feet in less than 5 minutes. The Bus Hoist lifts at the rate of about  $2\frac{1}{2}$  feet per minute to a maximum height of 5 feet.

Columbia Electric Car Hoists and Bus Hoists are money-savers in any shop.

*Ask for further particulars.*



*The*

Patent Applied For

*Columbia Hoist in the Connecticut  
Company's Shops at New Haven.*

# COLUMBIA MA

and Malleable Iron Company,



# Products

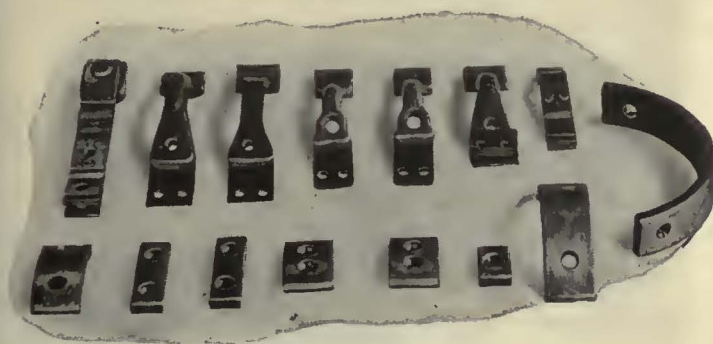
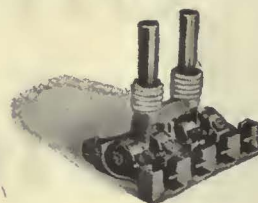
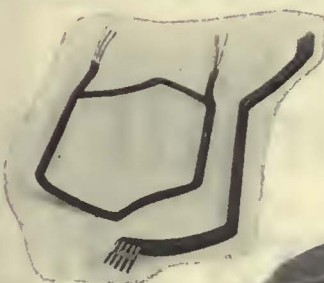
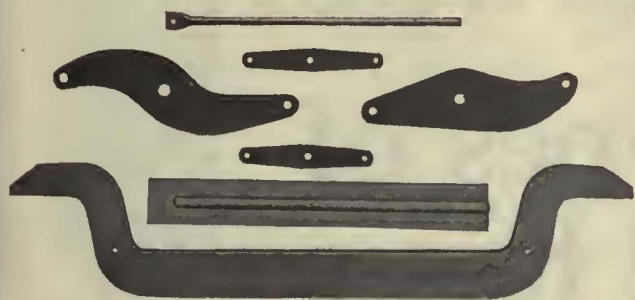
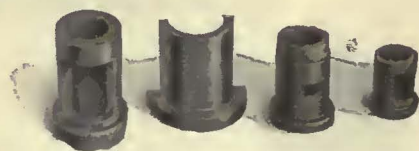
## Electric Railway Supplies

With a new and larger plant equipped with modern machinery, and thousands of patterns, jigs and fixtures, Columbia Shops are prepared to render better service than ever before to the industry. Thirty years' experience is behind this organization.

Prices and specifications on request, for any of the following Columbia Specialties:—

Trolley Wheels, Poles and Harps  
 Armature and Axle Bearings  
 Railway Motor Parts  
 Controller Parts  
 Gear Cases (Steel and Malleable Iron)  
 Terminals of All Types

Armature and Field Coils  
 Commutators (All Types)  
 Signal or Target Switches  
 Brush Holders  
 Resistance Grids  
 Line Material  
 Forgings and Castings, etc.



# MACHINE WORKS

Westnut Street—Atlantic Avenue Brooklyn, N.Y.



# ROOT

## Life Guards and Snow Scrapers

for all types of  
cars and buses

Write for specifications and quotations

Root Spring Scraper Co., Kalamazoo, Mich.



# 25,000 obsolete cars still in service

## Contrast them with the modern car heated and ventilated the Utility way



**UTILITY**  
2-Element  
Vestibule Heater  
No. 106

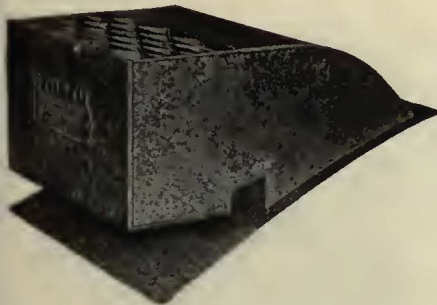
Utility Heaters are built throughout of non-deteriorating materials. Genuine Chromalox elements are the active parts, supported in such a way that no extra guards or shields are required.

And to be modern a car requires the best heating and ventilating system such as supplied by Utility heaters and ventilators. Passenger comfort is daily becoming a more important factor. It's the surest way of beating competition and increasing revenue.

Utility Car Heating and Ventilating Devices are standard equipment for many railway properties, having been proved by hundreds of installations the most effective equipment for conditioning the air in the car.



**UTILITY**  
New Type  
Heat Regulator  
No. 9 no relay.  
Greater uniformity of temperature and comfort with 50% saving in current.



**UTILITY**  
Honeycomb  
Ventilators

are constructed on the most scientific principle. Not only is the ventilation superior with this type of equipment, but a great saving in current for heating is also effected.



**Truss Plank Heater**  
Showing strip element in place and Air Duct.

# RAILWAY UTILITY CO.

141 to 151 W. 22nd St., Chicago, Ill.



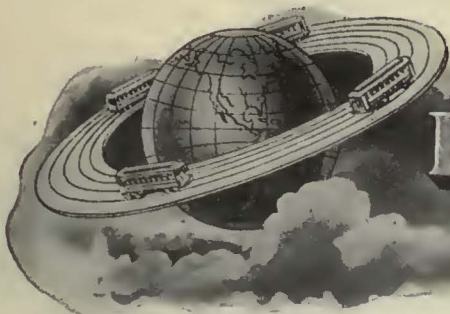




**Another year ~ another page in the book of time ~ another opportunity to make new friends ~**

**another bond to cement the old friendships which have stood fast through the years . . . . .**

**In the years which have passed it has been our privilege to create and establish car card space values. We look forward confidently to the work and pleasure we will find in maintaining them in the years which are to come . . . . .**

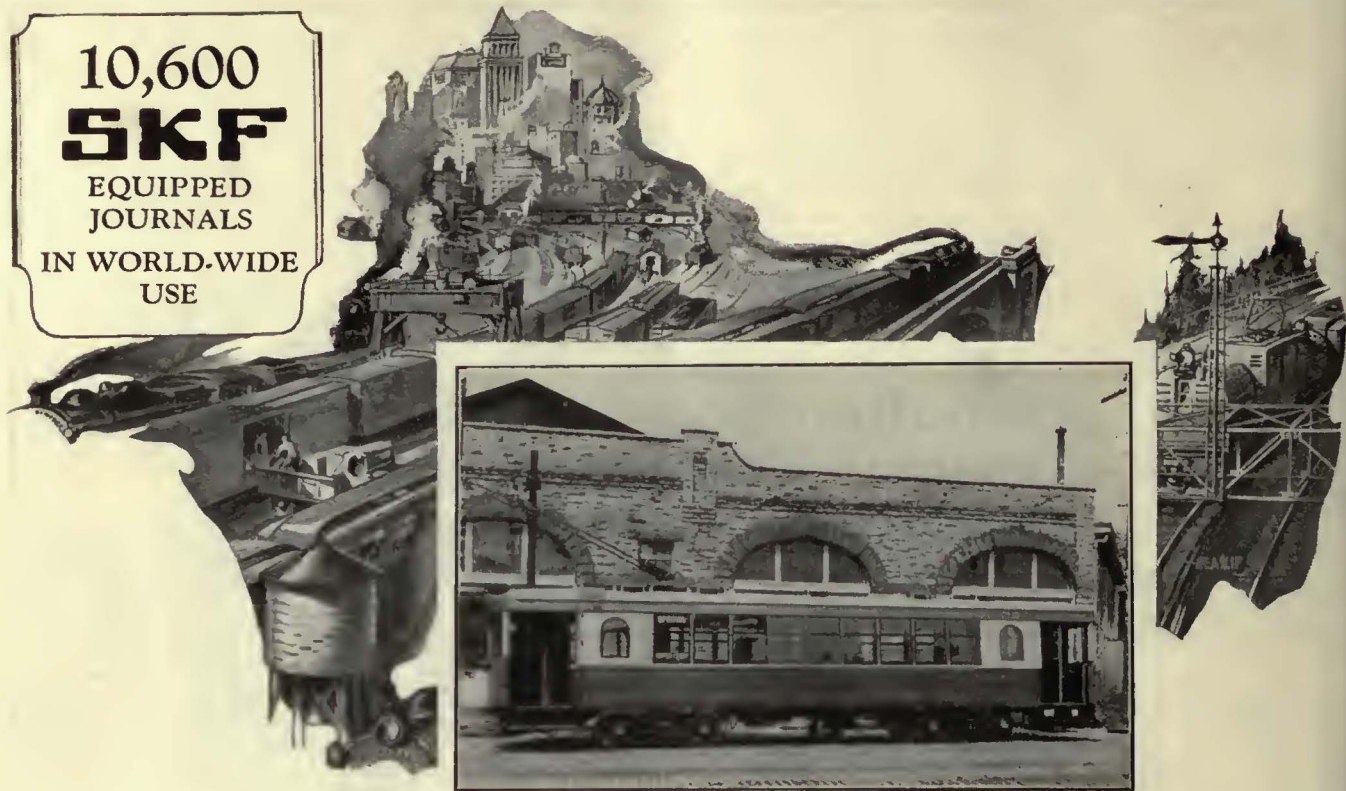


**Barron G. Collier**

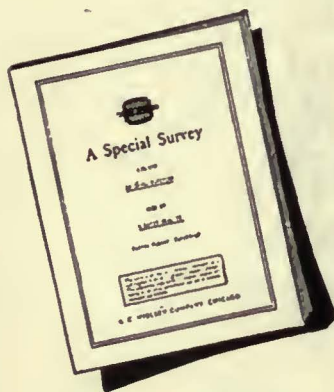
INCORPORATED



10,600  
**SKF**  
 EQUIPPED  
 JOURNALS  
 IN WORLD-WIDE  
 USE



Keep Cars on the Road – Improve Service  
 with **SKF** Equipped Journals



Special Certified Survey  
 Sent on Request

**P**ROFITABLE operation of street railway systems involves the modernizing of car equipment. An essential part of any such program calls for anti-friction bearing journals and motors which reduce maintenance costs and improve service.

**SKF** marked self-aligning roller bearings are finding wide favor in the electric railway field because they are rugged, dependable and do not require constant attention to keep rolling stock moving.

**SKF** INDUSTRIES, INCORPORATED  
 165 Broadway, New York City

1519

More than 100 Factory Offices Throughout the World

**SKF**  
 Puts the  
 Right Bearing  
 in the  
 Right Place

**Ball Bearings** **Roller Bearings**



1926

1926

**Start the New Year Right!!**

*Equip your cars with*

# **H-B LIFE GUARDS**

The most universally used life guards on street railways  
all over the world

**H-B Life Guards are used on the most modern  
and up-to-date Safety Cars**

*They are*

**Efficient Reliable Economical**

If your cars are equipped with H-B Life Guards give them a thorough overhauling and make sure they are in proper condition to do the work they are designed to do—**PREVENT FATAL ACCIDENTS AND INJURY TO LIFE AND LIMB.**

See that they are properly adjusted—**WRITE FOR OUR INSTRUCTION SHEET** on the proper method of installing H-B Life Guards.

In writing specifications for new cars be sure to

*Specify*

**H-B Life Guards *Manufactured by***

## **The Consolidated Car Fender Company**

This will insure your getting a guard substantially and properly built; backed by years of experience in specializing on these equipments.

**DO NOT ACCEPT A SUBSTITUTE  
INSIST UPON H-B LIFE GUARDS**

*Manufactured by*

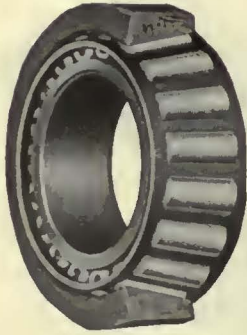
**The Consolidated Car Fender Company, Providence, R. I.**

**WENDELL & MacDUFFIE CO., General Sales Agents**

**110 East 42nd St., New York, N. Y.**



# Never too late to Earn



You know that your original equipment for power would have cost less based on the far lighter starting and running loads of Timken-equipped line shafting, highly-friction free.

You know that light-running Timken power transmission would have permitted lighter, less costly belts.

You know that depreciation would have been carried for less all these years, with misalignment, repairs and shutdowns guarded against by greater Timken Bearing capacity, for both radial and thrust loads.

You could go to a Timken-equipped basis right now, and have the whole cost come back in lubrication savings alone.

Have you figured that the endurance factor in Timken design and in Timken-made bearing steel leaves by far the biggest part of all possible savings still to be made? Write for data.

**THE TIMKEN ROLLER BEARING CO., CANTON, OHIO**

Technical information regarding bearing sizes and their mountings can be secured from the Timken Roller Bearing Service & Sales Company's Branches located in the following cities: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cleveland, Dallas, Denver, Detroit, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, Newark, New York, Omaha, Philadelphia, Pittsburgh, Portland, Richmond, St. Louis, Salt Lake City, San Francisco, Seattle, Toronto, Winnipeg.

**TIMKEN**  
*Tapered*  
**ROLLER BEARINGS**



# McGraw-Hill Home Study Courses

"Know your work as experts know it and get an experts pay"

## What will 1926 mean to you?

Next year you'll be a year older. Will you be a year advanced? Will your job be a year better? Will your pay be a year bigger?

Now is the time to start making 1926 your big money year. Now is the time to begin making each month pay you in additional dollars and cents.

No matter what field you are interested in, there is a practical McGraw-Hill Home Study Course to prepare you for the bigger and better-paying jobs. Thousands of men are using these courses in getting ahead. They can help you, too.

A few spare hours a week with any of these fact-packed libraries will repay you a hundred times over.

You will do something like this for yourself sometime—every man must. Do it now! Don't wait! You'll never miss the 7c. a day investment and—take it from those who know—you'll never regret it.

Choose the course you want to see—check and mail the coupon.



FREE TRIAL



NO MONEY DOWN



SMALL MONTHLY PAYMENTS



**1** *Croft's* LIBRARY OF PRACTICAL ELECTRICITY  
8 vols.—3000 pages—2100 illustrations

The books cover the entire field of electricity, from fundamental principles to central station work—from the operation of electrical machinery to outdoor and indoor electrical illumination.

\$10.50, payable \$1.50 in 10 days and \$2.00 a month.

**2** MACHINE SHOP LIBRARY  
9 vols.—3978 pages—3608 illustrations

Machine shop practice completely explained by men who have made their success in the field and know how everything should be done. Packed to the covers with the kind of information that every machinist, every apprentice, every toolmaker and shop foreman wants.

\$19.50, payable \$1.50 in 10 days and \$2.00 a month.

**3** LIBRARY OF ELECTRICAL MAINTENANCE AND REPAIR

5 vols.—1736 pages—1818 illustrations  
The only library of its kind. Contains the largest collection of practical methods for electrical maintenance and repair men ever put together. Covers wiring diagrams, armature winding, motor repair, connecting induction motors, electrical machinery and electrical methods of all kinds.

\$14.00, payable \$2.00 in 10 days and \$2.00 a month.

**4** LIBRARY OF POWER PLANT PRACTICE

9 vols.—3978 pages—3778 illustrations  
These books cover everything that the power plant man must know to fill a big-pay position. Thousands of first-hand facts—thousands of specially drawn illustrations. Practical from beginning to end.

\$19.50, payable \$1.50 in 10 days and \$2.00 a month.

Only 7c. a day for the course you want—Examine your set for 10 days FREE

**5** AMERICAN ELECTRICIANS' LIBRARY  
6 vols.—over 2000 pages—fully illustrated

This set describes practical procedures in handling all types of electrical wiring. It gives definite step-by-step directions, shows how to locate troubles, how to remedy them, how to test connections for all wiring work from theater lighting to conduit wiring. Over 1000 practical wiring diagrams are included.

\$16.00, payable \$2.00 in 10 days and \$2.00 a month.

**6** *Mitchell's* PRINCIPLES AND PRACTICE OF TELEPHONY  
5 vols.—1436 pages—fully illustrated

A complete course in modern telephone practice covering everything from the basic principles to the most complicated apparatus in use today. Clearly written—easily understood—practical from cover to cover.

\$12.00, payable \$2.00 in 10 days and \$2.00 a month.

**7** PRACTICAL AUTOMOBILE LIBRARY  
4 vols.—1664 pages—1555 illustrations

Covers the whole subject of automobile construction, maintenance and repair. Gives definite, how-to-do-it information on every angle of automobile practice. Written by five well-known teachers who have prepared thousands of men for big-pay automobile jobs. If you want to make your way in the automobile field, this is the set for you.

\$13.50, payable \$1.50 in 10 days and \$2.00 a month.

**8** *Holl's* LIBRARY OF ADVERTISING AND SELLING  
4 vols.—3323 pages—1090 illustrations

Complete and practical information on every phase of advertising and selling. Tells you how to plan and prepare successful advertising material. Shows you how to handle big and little selling problems. Covers as much ground as courses costing five and ten times as much.

\$17.50, payable \$1.50 in 10 days and \$2.00 a month.

Choose your course—Mail the coupon

### McGraw-Hill Free Examination Coupon

McGraw-Hill Book Co., Inc.,  
370 Seventh Avenue, New York.

Send me for 10 days' free examination the library I have checked below. If satisfactory, I will send first payment (either \$1.50 or \$2.00) in 10 days and pay the balance at the rate of \$2.00 a month until the full price has been paid. If I do not wish to keep the books, I will return them at your expense on your shipping instructions.

- |  |  |
|--|--|
| <input type="checkbox"/> Practical Electricity, \$19.50.             | <input type="checkbox"/> Amer. Elect. Library, \$15.00.    |
| <input type="checkbox"/> Machine Shop Practice, \$19.50.             | <input type="checkbox"/> Telephony, \$12.00.               |
| <input type="checkbox"/> Electrical Maintenance and Repair, \$14.00. | <input type="checkbox"/> Auto Library, \$13.50.            |
| <input type="checkbox"/> Power Plant Practice, \$19.50.              | <input type="checkbox"/> Advertising and Selling, \$17.50. |

Name .....

Address .....

City and State .....

Employer .....

Occupation .....

Mail this FREE Examination Coupon



**IRVING****SAFKAR** TRADE MARK **STEP**

Not a "tread," with a limited life—but a complete, self-contained, all-steel safety step with the life of a steel structure. Its non-slipping surface is integral with the step—never wears out—never wears off—is permanently slip-proof, wet or dry. Clean, too—because dust, dirt, mud, snow, fall through the "mesh"—are not tracked into the car. Passenger interchange is quickened, by the secure "Safkar" foothold. Car step accidents—so frequent and often costly—are minimized.

Damages paid for one car-step accident may cost you more than a complete "Safkar" equipment for every car on your system. Write for Catalog 4A28.

P-108

**IRVING IRON WORKS CO.**  
LONG ISLAND CITY, N.Y. U.S.A.



# DIFFERENTIAL STATISTICS



## Differential Cars (*side dump*)

56 Companies using Differentials.

260 Differentials in service.

11 year old Differentials still giving good service.

1½ cents per ton mile for placing material on the job with Differentials.

1 year. Average length of time required for actual savings made by Differentials to equal their cost.

## The Differential Steel Car Company

has been devoting its entire energy and resources for 11 years to developing work car equipment for electric railways. The development of this equipment has been a result of faith in the railways' future.

### THE DIFFERENTIAL ELECTRIC LOCOMOTIVE CRANE CAR

*Designed and Constructed for Electric Railways*

In the past few months 4 of the leading traction companies have purchased 8 of these crane cars. This new electric railway development should have a great appeal to all railway operators.

*Send for Bulletin D-16*

### THE DIFFERENTIAL CAR WHEEL TRUCK AND TRACTOR

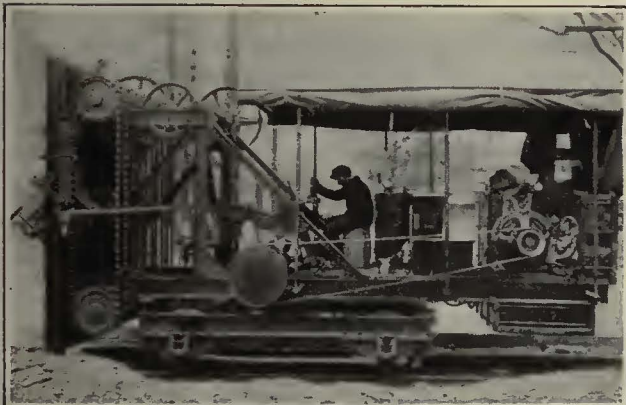
10 of these devices are being used on 6 railway properties for mounting Electric Shovels. This dual traction truck, allowing machine to travel on rails or on ground, increases shovel capacity 75% and cuts labor force in half.

*Send for Bulletin D-10*

### THE DIFFERENTIAL BOTTOM DUMP CAR

is being used with great saving wherever open track is to be ballasted.

## THE DIFFERENTIAL STEEL CAR CO. FINDLAY, OHIO



### CLARK CONCRETE BREAKER

Used by many of the leading traction companies.  
Breaks concrete for less than 2c per track ft.



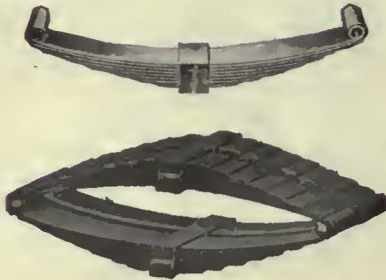
### THE DIFFERENTIAL ELECTRIC LOCOMOTIVE CRANE CAR



# FORT PITT



—for over 20 years  
the standard spring  
for railway service



Leading electric railway operators throughout the country have learned to rely on Fort Pitt Springs. They appreciate the unfailing service which these springs have given not only on electric railway, but also on steam railway locomotives, freight and passenger cars.

Prompt shipments made on either standard or special types. Ask for quotations on your requirements.

Full Elliptics for Car Trucks.

Half Elliptics for Locomotives and Cars.

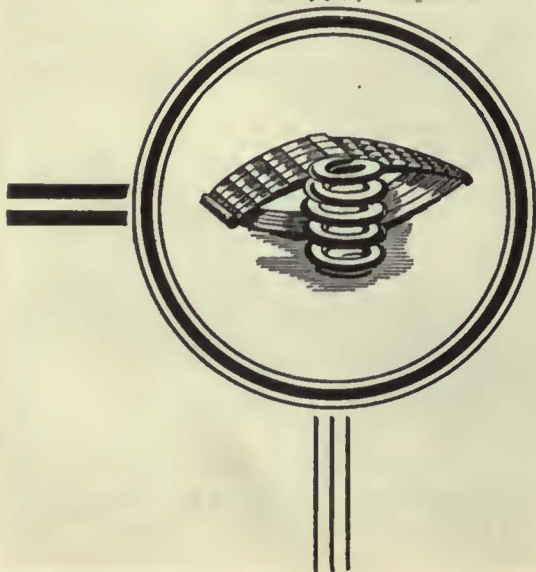
Special Types of Quarter, Half and Three-quarter Elliptics for Electric Railway Service.

Drawbar Springs.

Equalizer Springs.

Extension Springs.

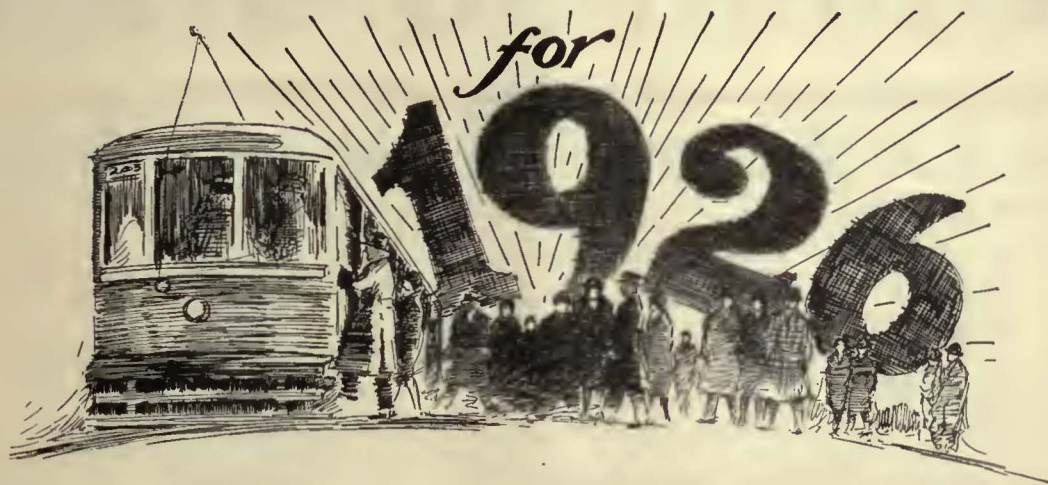
*Copies of abridged catalog and specification book sent on request.*



**Fort Pitt Spring & Mfg. Co.**  
Pittsburgh, Pa.



# All aboard and *more* aboard



## Two good New Year better business tips

(1)

**Nuttall**

**Standard BP Helical Gears**

People who use other means of transportation than your street cars do so for two reasons—convenience and comfort. Make your cars more comfortable, easier riding, convenient in design, and they'll not lack for increased patronage.

You can take a big step in the right direction without disorganizing present service and without re-financing—by equipping with Nuttall Helical Gears. They will eliminate all the racking noises and vibration of spur gearing—for Nuttall Helicals mesh like the turning of a screw.

Furthermore the BP Heat Treatment of Nuttall Helicals in itself guarantees at least three times greater gear life, quite apart from savings in maintenance effected through elimination of vibration, and the gears cost you about 70% less in the long run than untreated gears.



(2)



*The new*

**Nuttall Form US 20A**

**Timken Roller Bearing Trolley Base**

A really *new* trolley base, simplified and engineered to the same high standards of efficiency and low maintenance as the modern car motor. Incorporates the famous Timken Roller Bearing—a tapered double-race roller bearing designed by this manufacturer especially for trolley base service.

Profitably interesting features include extreme sensitiveness, with swiveling strains evenly distributed on bearings; oil and grease reservoirs for lubrication of bearings and pole socket axle pin respectively; quick, easy lubrication only once in six months.

*Full specifications on request.*

**R.D. NUTTALL COMPANY**  
**PITTSBURGH**  **PENNSYLVANIA**

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

# Nuttall

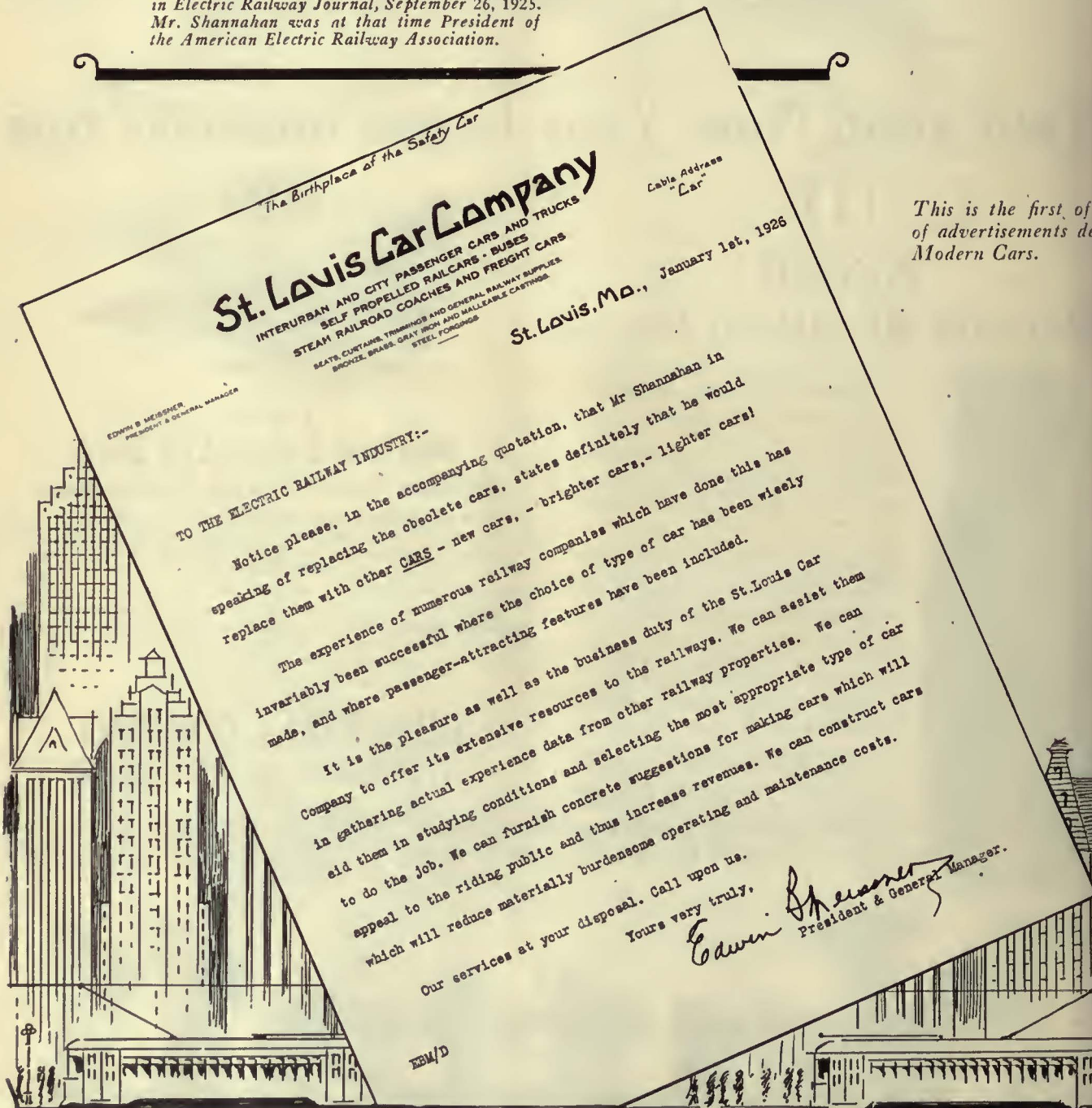


# MODERN CARS for

**J. N. Shannahan said—**

“I would relegate to the scrap pile the old, heavy and obsolete cars, replacing them with new, brighter and lighter cars, in most instances with one-man cars.”

*Quoted from paper by J. N. Shannahan published in Electric Railway Journal, September 26, 1925. Mr. Shannahan was at that time President of the American Electric Railway Association.*



*The Birthplace of the Safety Car*

## St. Louis Car Company

INTERURBAN AND CITY PASSENGER CARS AND TRUCKS  
SELF PROPELLED RAILCARS - BUSES  
STEAM RAILROAD COACHES AND FREIGHT CARS  
SEATS, CURTAINS, TRIMMINGS AND GENERAL RAILWAY SUPPLIES  
BRONZE, BRASS, GRAY IRON AND MALLEABLE CASTINGS  
STEEL FORGINGS

Cable Address  
"Car"

St. Louis, Mo., January 1st, 1926

EDWIN B. MESSNER  
PRESIDENT & GENERAL MANAGER

TO THE ELECTRIC RAILWAY INDUSTRY:-

Notice please, in the accompanying quotation, that Mr Shannahan in speaking of replacing the obsolete cars, states definitely that he would replace them with other CARS - new cars, - brighter cars, - lighter cars!

The experience of numerous railway companies which have done this has invariably been successful where the choice of type of car has been wisely made, and where passenger-attracting features have been included.

It is the pleasure as well as the business duty of the St. Louis Car Company to offer its extensive resources to the railways. We can assist them in gathering actual experience data from other railway properties. We can aid them in studying conditions and selecting the most appropriate type of car to do the job. We can furnish concrete suggestions for making cars which will appeal to the riding public and thus increase revenues. We can construct cars which will reduce materially burdensome operating and maintenance costs.

Our services at your disposal. Call upon us.  
Yours very truly,  
*Edwin B. Messner*  
President & General Manager.

*This is the first of a series of advertisements devoted to Modern Cars.*

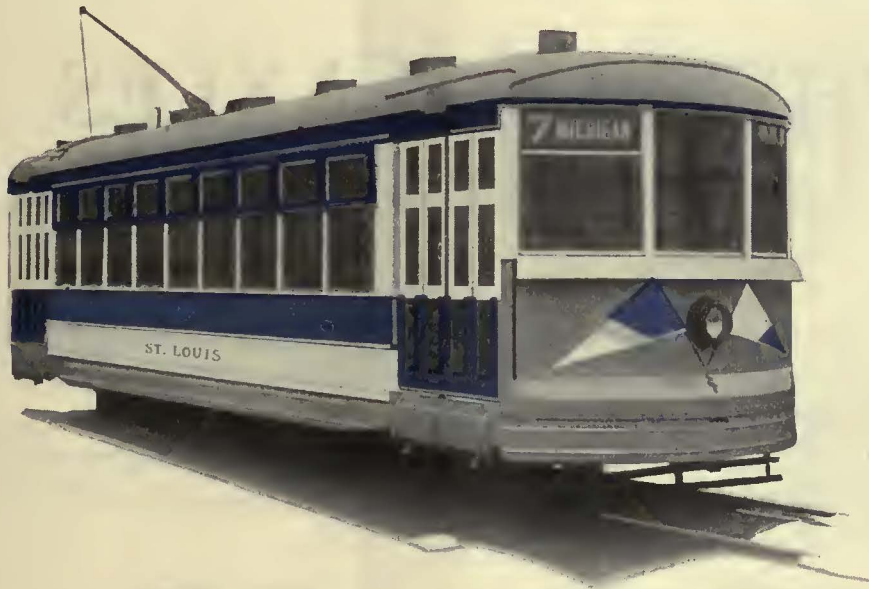
EBM/D



# Modern Conditions— Grand Rapids Railway Co. Leads!

After careful investigation, and thorough service tests, extending over a period of many months, with experimental sample cars, the Hodenpyl-Hardy Interests, keenly alive to the trend of the times and the wishes of the riding public—have as a concrete example of their convictions placed a substantial order for new, attractive, modern cars, not only economical in operation and maintenance, but appealing and pleasing to the public.

## The Quality Car Wins



**Order for 27 Cars Placed  
by Grand Rapids Railway Co.  
Grand Rapids, Mich.**

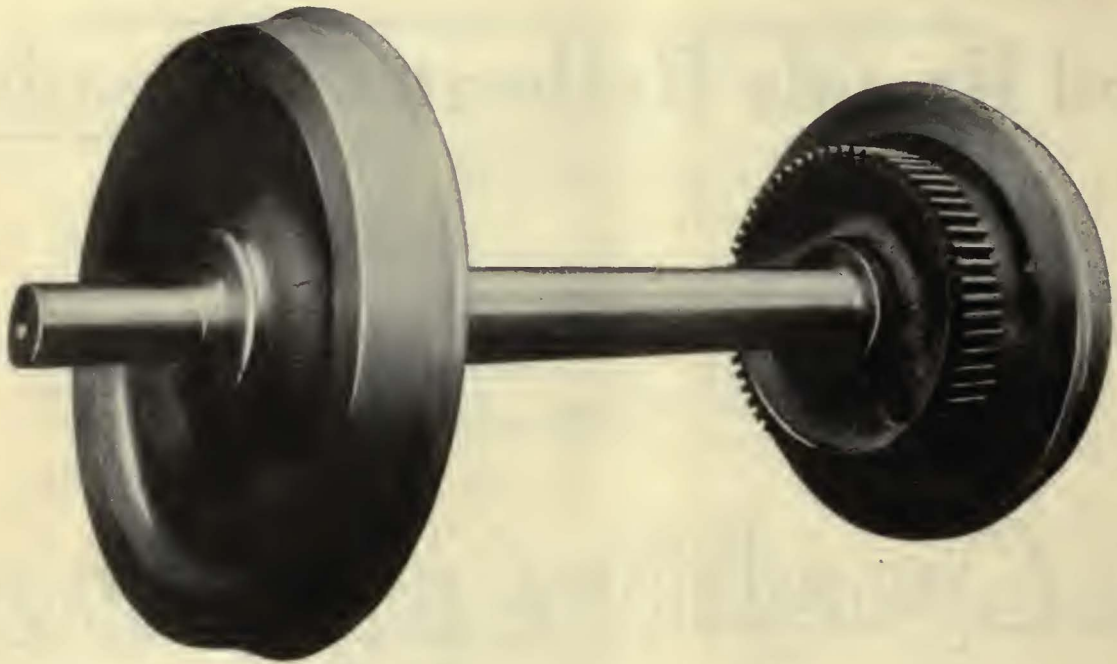
*with*

**St. Louis Car Company  
St. Louis, Mo.**

*"The Birthplace of the Safety Car"*







## WHEELS and AXLES

The choice of representative railroads, which have taken steps to procure the latest and best in rolling stock—STANDARD STEEL Wheels and Axles are found on the majority of finest railway cars. Light-weight city and interurban equipment as well as the heaviest electric traction services are included in the list of transportation companies specifying "STANDARD STEEL" for their modern cars.

# STANDARD STEEL

WORKS COMPANY  
PHILADELPHIA, PA.

BRANCH OFFICES:

Chicago  
St. Louis  
New York  
Houston, Texas

Portland, Ora.  
Richmond, Va.  
San Francisco  
Boston

St. Paul, Minn.  
Pittsburgh, Pa.  
Los Angeles, Cal.  
Mexico City, Mex.

WORKS: BURNHAM, PA.

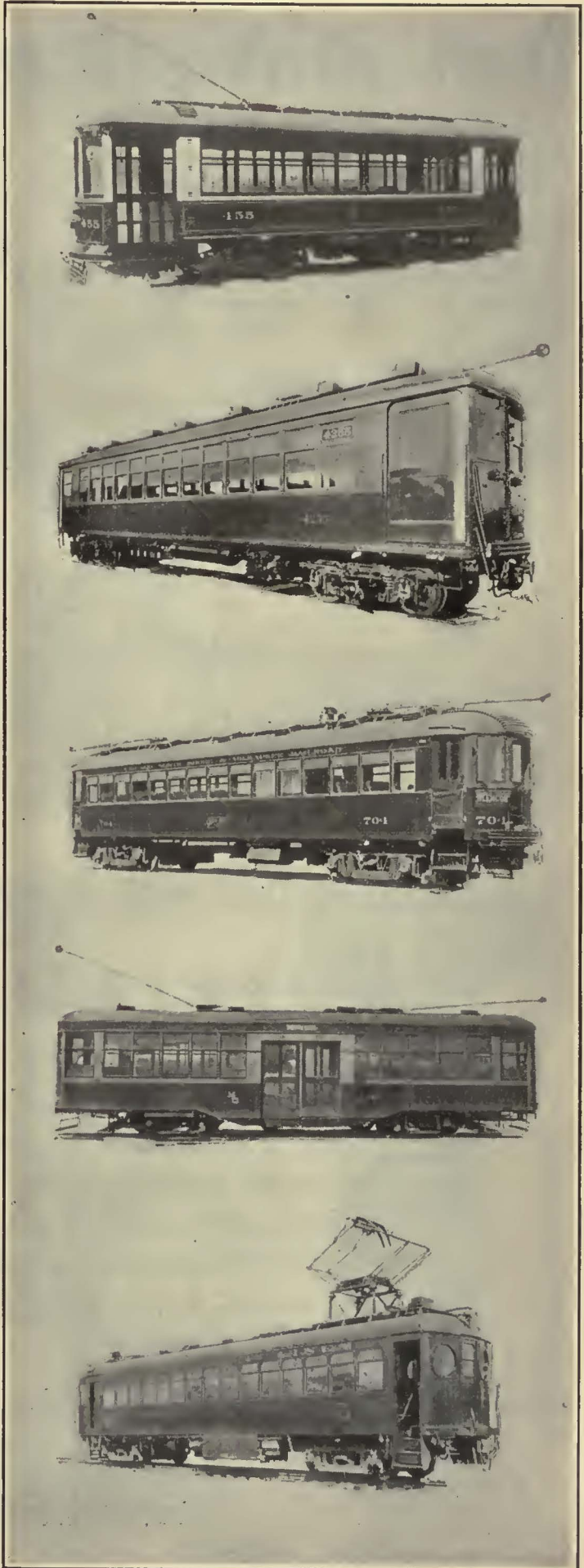


---

*For  
modern  
cars*

---

*Rolled Steel Wheels  
Quenched and  
Tempered Carbon  
Steel Axles  
Coil and Elliptic  
Springs*





# Not statistics—just a little



## Just what we mean by "Boyerized"

Boyerizing is a special hardening process which gives steel parts a glossy glass-hard armor coating that literally offers no "foothold" to wear. Under the grinding strain of brake and truck service on electric railway cars, Boyerizing becomes practically essential, not only from the viewpoint of costs, but because of the extra measure of safety it assures.



The MacArthur Turnbuckle

Instead of a big coarse-threaded jam nut that needs a two-fisted wrench for application you require only a pocket-size wrench that is applied at a convenient angle. The secret? The jam-nut idea is replaced by a split clamp with a spring power that won't be loosened once the little nut on the side has been tightened.

#### REPRESENTATIVES:

Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.  
 F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.  
 W. F. McKenney, 54 First Street, Portland, Oregon.  
 J. H. Denton, 1328 Broadway, New York City, N. Y.  
 A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.



# “plain figurin”



PERFORMANCE data on BOYERIZED Parts resolves itself into a mighty simple formula. In a nutshell, BOYERIZING gives these parts a life equal to *three or four* times that of ordinary steel. Yet the cost of BOYERIZED Parts is not even twice that of ordinary steel parts.

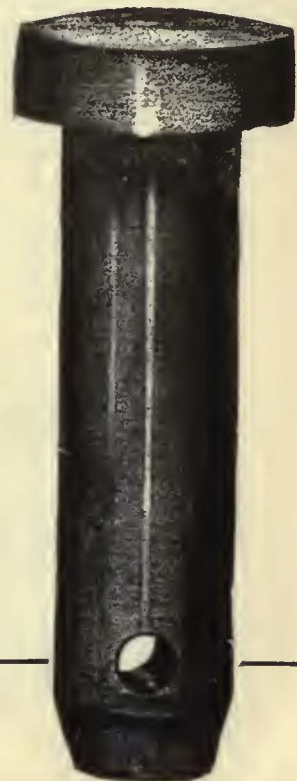
You don't need statistics to prove so obvious a saving,—just a little “plain figurin” will do. And you'll find ample proof of the authenticity of our claims in the records of any BOYERIZED railway. Better still, be your own judge—

## BOYERIZE

one or more cars for a test.

Here's the list to choose from

Brake Pins	Spring Post Bushings
Brake Hangers	Spring Posts
Brake Levers	Bolster and Transom Chafing
Pedestal Gibs	Plates
Brake Fulcrums	MacArthur Turnbuckles
Center Bearings	Manganese Brake Heads
Side Bearings	Manganese Truck Parts
Bushings	Bronze Bearings.



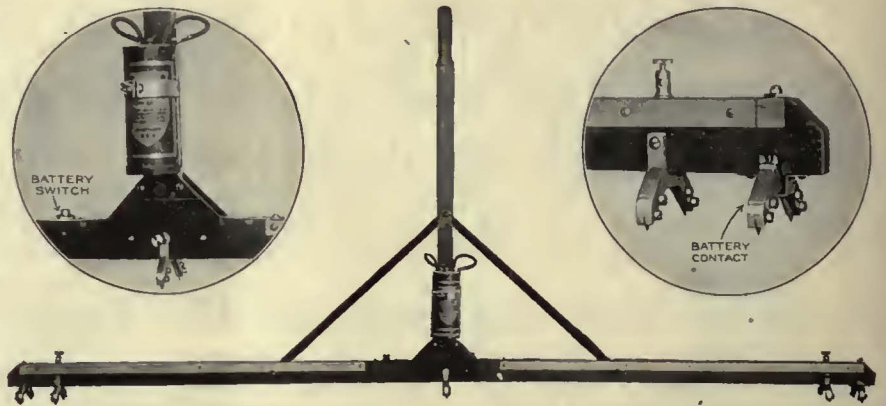
**Bemis Car Truck Company**

*Electric Railway Supplies*  
Springfield, Mass.



# The most IMPORTANT development in the BOND TESTING LINE in years

*New*  
**ROLLER-SMITH**  
**Type BBT**  
**BOND TESTER**  
 and  
**CONTACT**  
**BAR**



The new Type BBT Bond Tester is intended for use where the current in the rail is comparatively feeble or where such current is absent, as on new construction or at the ends of trolley lines where no cars are running beyond the point where tests are being made.

The Type BBT Bond Tester has over *five times* the sensitivity of the most sensitive bond tester heretofore made. *It can be successfully used with the current from a single No. 6 dry cell.* This dry cell and the battery switch and con-

tacts are clearly shown in the illustration above.

The Type BBT Bond Tester itself is illustrated below.

Every man who is *any* way interested in bond testing should know all about this new instrument. If you will fill in and forward the coupon below a copy of new Bulletin No. G-200 will be sent you promptly. Or, better still, get in touch with the R-S office nearest you. There is one in every principal city.

*"Over thirty years experience is back of ROLLER-SMITH"*

## ROLLER-SMITH COMPANY

Electrical Measuring and Protective Apparatus



*Main Office*  
 2128 Woolworth Bldg., NEW YORK

*Works:*  
 Bethlehem, Penna.

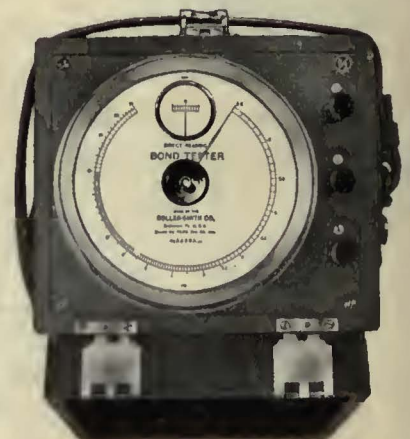
*Offices in principal cities in U. S. and Canada, also in Havana, Cuba*

Roller-Smith Co., 237 Broadway, New York City, N. Y.

Please send new Bulletin G-200.

Name.....City.....State.....

Company.....Position.....





# WHARTON TRACKWORK

Switches, Mates, Frogs  
for severest  
traffic conditions



**Easton, Pa.**  
Special Trackwork.  
Cylinders for Gases.  
Hollow Rollers.



**Philadelphia, Pa.**  
Rolls and Rolling  
Mill Machinery.  
Forgings.



**High Bridge, N. J.**  
Manganese Steel  
Wearing Parts.

Since the very beginning of the electric railway industry Wharton Products have successfully withstood the severest tests of service. Our TISCO manganese steel trackwork for example has time after time proved its exceptional durability.

Included in our designs are those of the American Railway Engineering Association as well as those we originated.

Our more than sixty years' experience is available for those desiring our assistance in designing or selecting standard and special trackwork.

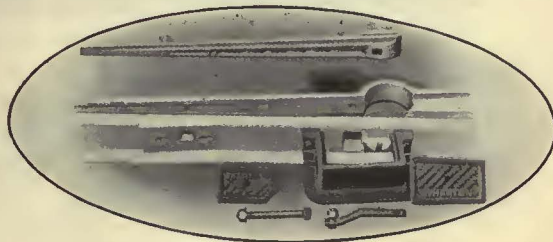
*Consult us about your trackwork problems.*

**Wm. Wharton Jr. & Co., Inc.**  
**Easton, Pa.**

Sales Offices:

Boston, Mass.  
Chicago, Ill.  
El Paso, Tex.  
Montreal, Can.  
New York, N. Y.

Philadelphia, Pa.  
Pittsburgh, Pa.  
Salt Lake City, Utah  
San Francisco, Cal.  
Scranton, Pa.





---

...and there on his desk



PHOTOGRAPHED BY PAYNTER

*W. Kesley Schoepf, one of the best known traction authorities in the country, who retired from the presidency of The Cincinnati Traction Company when that company was taken over by The Cincinnati Street Railway Company on November 1, 1925. One of Mr. Schoepf's less generally known achievements was his eminently successful personnel relations, fully twenty per cent of The Cincinnati Traction Company's employees at the time of his retirement having individual service records of twenty-five years or more.*



# was a piece of Elastite!

**S**HORTLY after the sale of the Cincinnati street railway properties from The Cincinnati Traction Company to The Cincinnati Street Railway Company, which relieved W. Kesley Schoepf, President of The Cincinnati Traction Company, from the responsibilities of operating the street railway lines, an old-time friend dropped into his office to offer congratulations on the success of a dinner given by Mr. Schoepf to officials and employes of the operating companies who had been associated with him as co-workers for the quarter century period covered by Mr. Schoepf's residence in Cincinnati.

Mr. Schoepf's friend was impressed by the fact that for the first time in the thirty-five years of his acquaintance, the retiring executive's desk was clear of business papers. True there were plans for improvements in his country estate at Sheffield Farm, but the only article in sight in any way relating to his traction interests, was a section of rail with the Carey Elastite System of Rail Filler. Mr. Schoepf's friend commented on the presence of this model, which brought from Mr. Schoepf an emphatic explanation.

"I have been trying for over thirty years to find suitable material to fit in next to street car rails to prevent a rapid deterioration of street paving within the track area, not only as an economical proposition, but to bring about an improved appearance of both the tracks and the street pavements.

"About 1915 a representative of The Philip Carey Company brought to the attention of our Engineer of Maintenance of Way a material for this purpose, which he termed an Elastite Rail Filler. Later this matter was brought to my attention. I was so impressed with the possibilities that I decided to experiment with some installations. In the meantime, I also concluded to try creosoted wood filler fitted into position along the rail. This, however, did not give the results anticipated, and since The Philip Carey Company had, by this time, made rapid strides in the matter of production and corresponding reduction in cost, I felt impelled to close a long term contract with that company to use its material in all reconstruction and maintenance of tracks.

"This material is an outstanding improvement in track construction methods and I frankly believe it a radical departure from some of the old methods, and is providing a solution of one of the greatest problems encountered in the maintenance of paving in the track area and in the reduction in noises due to operation of cars."

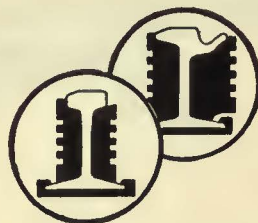
## THE PHILIP CAREY COMPANY Lockland, Cincinnati, Ohio



Carey Elastite System of Track Insulation is an asphaltic compound substantially reinforced with asphalt-saturated felt. It is not affected by moisture or temperature changes and will outlive the track itself. It can be fitted over splice-bars and bolt-heads simply by cutting it with a hatchet, and can easily be fitted to any shape or curve. A tap with a mallet sets the pre-formed strips in place.

Write, today, for complete information.

**Carey**  
REG. U.S. PAT. OFF.  
**Elastite**  
TRADE MARK REGD. U.S. PATENT OFFICE



**SYSTEM OF  
TRACK INSULATION**

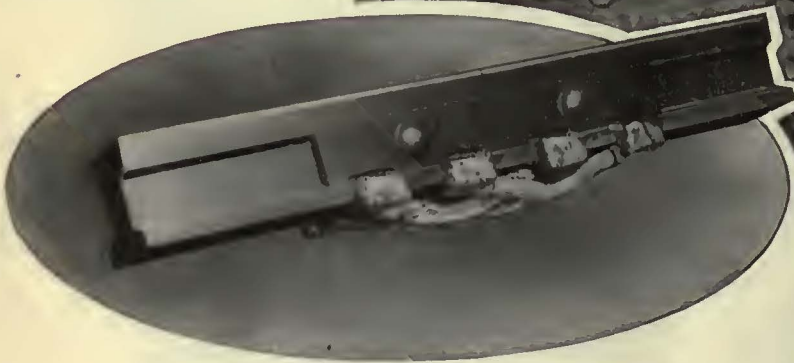


# FLAMEWELD RAIL BONDS



Complete bonded joint showing 4—400,000 c. m. type F. C. D. bonds on 150 lb. third rail.

View along right-of-way of the Staten Island Rapid Transit Railway, St. George, Staten Island.

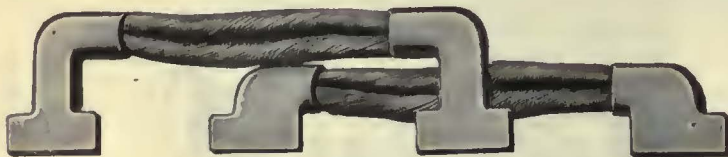


Detail view of type F. C. D. third rail bonds for application by flamewelding. The terminals of these bonds are of dropped forged copper, providing a large contact area for welding, resulting in a low resistance bond.

American Steel & Wire Company Flameweld Bonds and Rubber Covered and Braided feeder and jumper Cables were used throughout on the third rail system of the Staten Island Rapid Transit Railway.

In Flameweld rail bonds is found a valuable combination—ease of installation, low electrical resistance, permanent contact, and ability to withstand continuous service.

Our engineers have at hand a fund of useful experience in solving difficult bond problems. Draw on them for advice or information at any time.

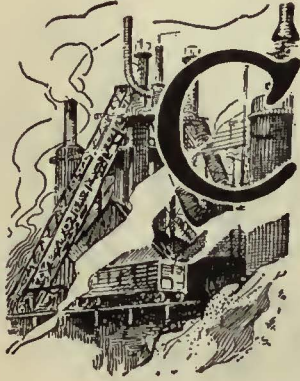


MADE BY

## AMERICAN STEEL & WIRE COMPANY

CHICAGO, NEW YORK, BOSTON, BIRMINGHAM. DALLAS, DENVER.  
U. S. STEEL PRODUCTS CO.: SAN FRANCISCO, LOS ANGELES, PORTLAND, SEATTLE.





ARNEGIE STEEL COMPANY  
extends to you  
cordial greetings  
for the New Year  
with sincere wishes that the year  
Nineteen twenty six  
will bring you prosperity  
and success







## DAVIS "ONE WEAR" STEEL WHEELS ARE WORTH MORE—WHY?

- The wear resisting qualities of special composition heat treated steel insures a big mileage on One Wear.
- They never need contour conditioning.
- They are lighter in weight, which permits heavier revenue loading.
- They keep cars at work instead of in the shop.
- They do away with shimming cars.
- They avoid capital expenditure for wheel conditioning.
- They release men and machinery for other work.
- They reduce journal brass costs by avoiding the scraping of good brasses at wheel turning periods.
- They increase dependability of equipment by reducing "shell-outs," "brake-burns," "chipped flanges" and other wheel failures.
- They are safer and stronger wheels.

### DAVIS "ONE WEAR" STEEL WHEELS

have proven that they are worth  
more than any other wheel.

### AMERICAN STEEL FOUNDRIES

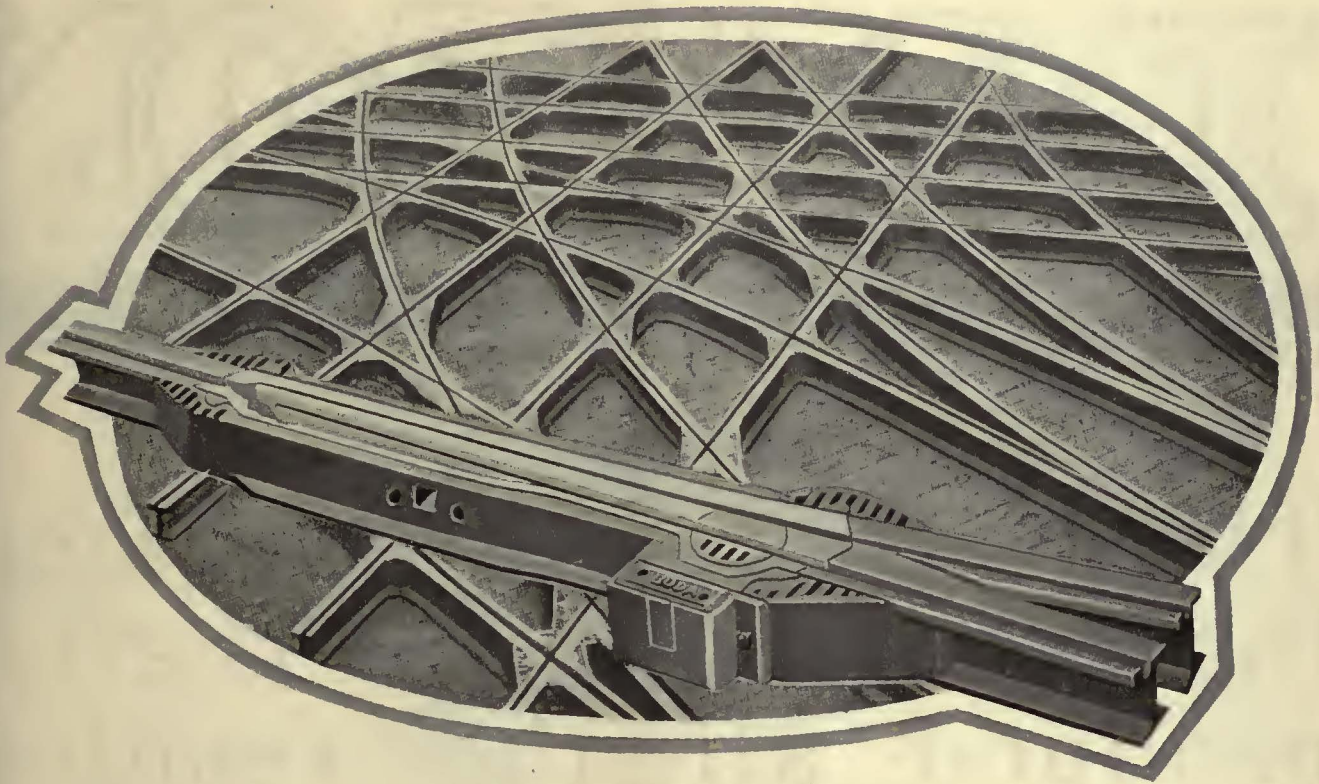
NEW YORK

CHICAGO

ST. LOUIS

DAVIS WHEELS ARE SAFER WHEELS





Manganese Center Special Track Work

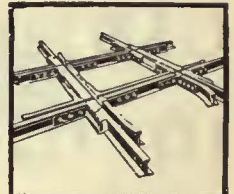
Behind Buda track work and equipment lies forty-four years' experience and the most modern facilities. The name BUDA is an assurance of the highest quality throughout.

*Send us your inquiries.*

THE BUDA COMPANY  
HARVEY (Chicago Suburb), ILL.



Track and Bonding Drill



Railroad Crossing



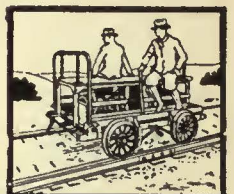
Track Jack



Crossing Gates



Bus Engines



Motor Car



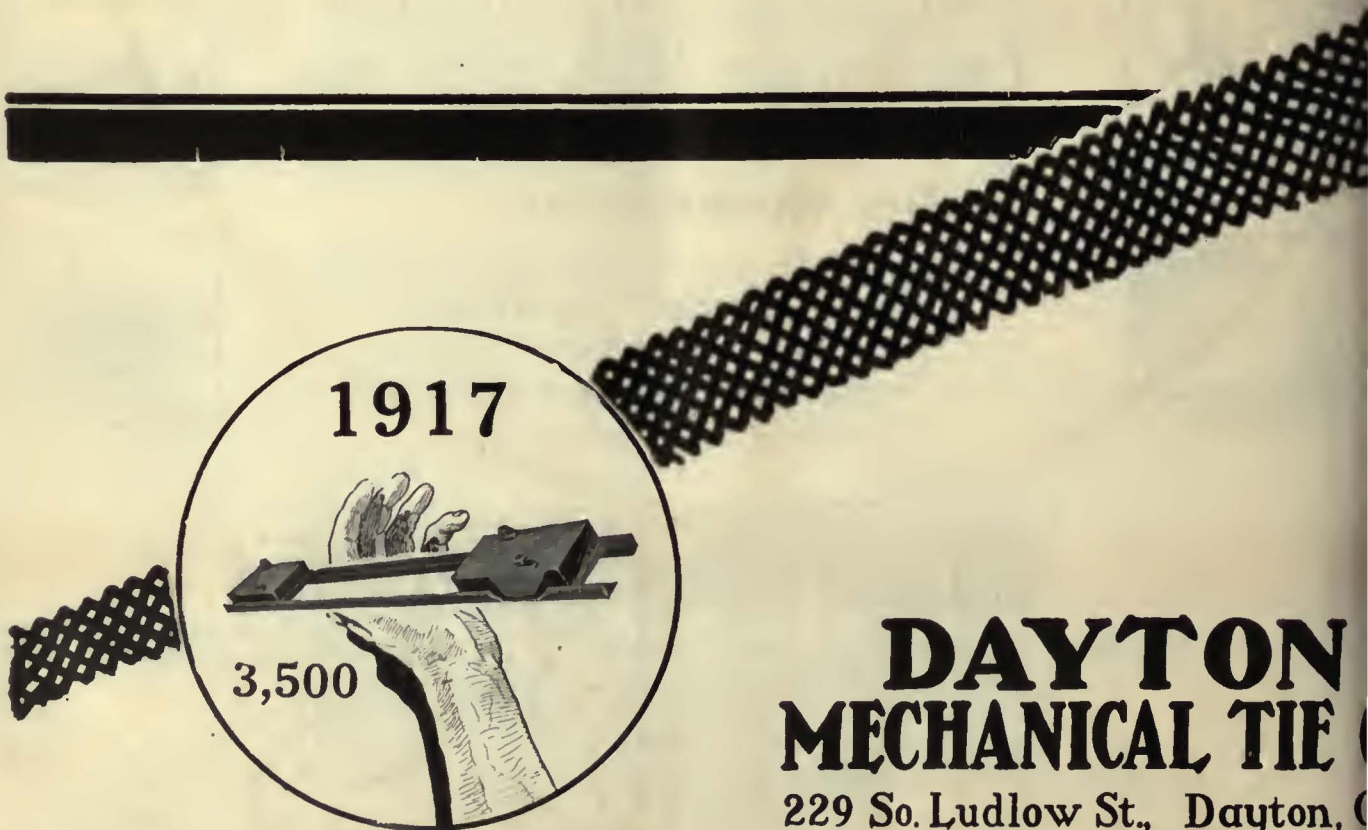


# DAYTON

---

The best proof of the fact that *Dayton Ties* do really produce all the results claimed for them is found in their increased use.

---

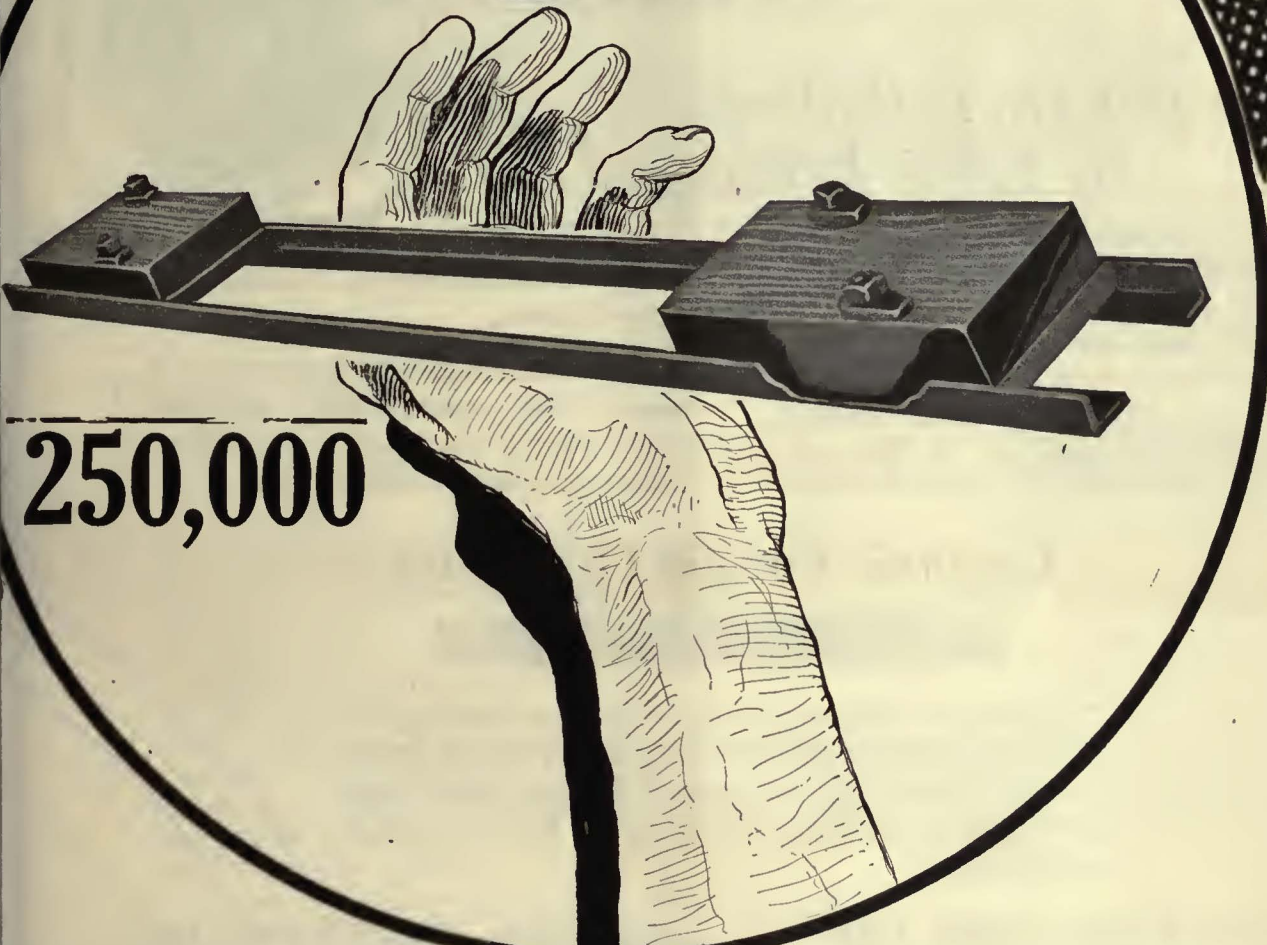


**DAYTON**  
**MECHANICAL TIE**  
229 So. Ludlow St., Dayton, O.



# RESILIENT MECHANICAL

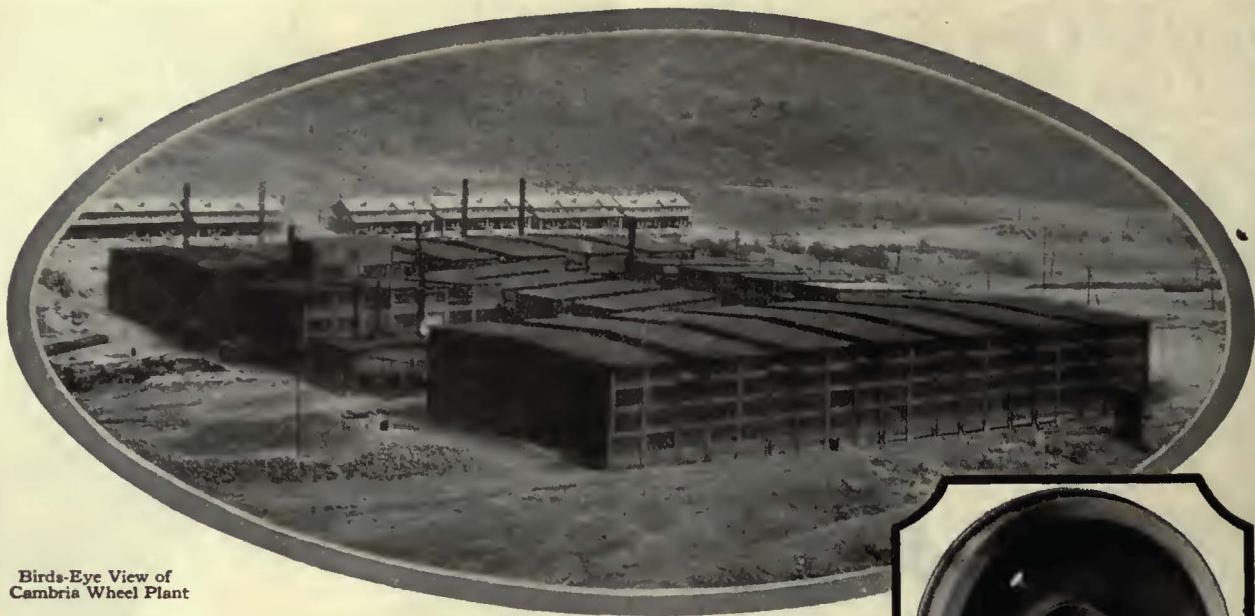
# 1925



250,000

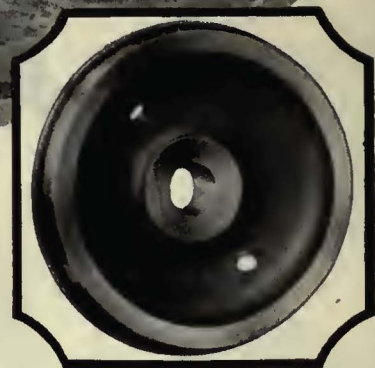
# TIES





Birds-Eye View of  
Cambria Wheel Plant

## Forged *then* Rolled —to Give Longer Life



Cambria Wheels are made by a combined forging and rolling process which gives them great durability and an exceptionally long life.

The forging process gives strength, toughness and density to the metal, while the rolling establishes a grained

structure which prevents breakage and crystallization.

Long experience in the manufacture of wheels and control over materials assure you of a product of the highest quality and finest workmanship.

## Cambria Forged Car Axles



Cambria Car Axles are made of the same fine quality as Cambria Wheels and can be furnished smooth forged or rough turned all over; solid or hollow bored; rough turned on journals and wheel seats; heat treated or untreated.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

### DISTRICT OFFICES

New York    Boston    Philadelphia    Baltimore    Washington    Atlanta    Pittsburgh  
Buffalo    Cleveland    Detroit    Cincinnati    Chicago    St. Louis    San Francisco    Seattle    Los Angeles  
Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

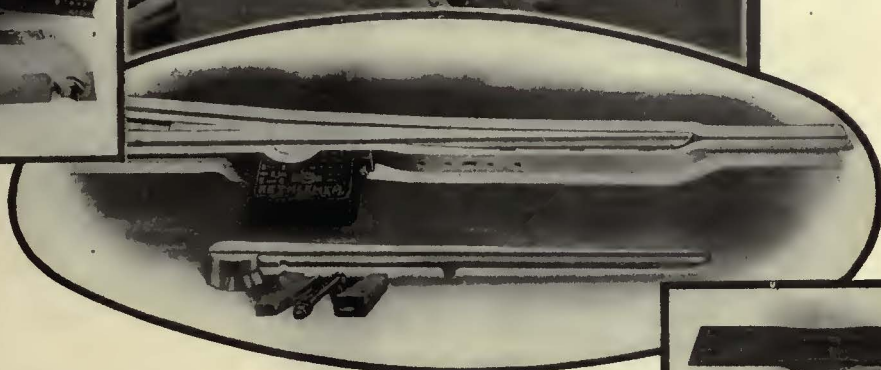
# BETHLEHEM

## CAMBRIA CAR WHEELS AND AXLES



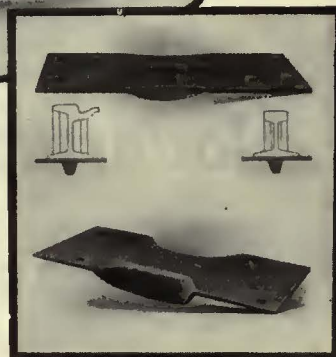


Hard Center Frog  
Iron-bound Type  
Design 942



Main Illustration—Interior View of Track  
Assembly and Layout Building

In Oval—Solid Manganese Tongue Switch  
Design 905



Upper Object—Center Rib Base Plate  
Lower Object—Abbott Base Plate

## From Ore to Finished Trackwork

All materials, rails, plates, bars, forgings, castings, bolts, etc., are made in Bethlehem Plants—from ore to finished product under Bethlehem constant supervision.

Great care and attention is given to special layouts. Before shipment layouts are assembled to make sure that they will correctly meet conditions in the field.

The fitting up work is done under roof where workmen are shielded from inclement weather, thus enabling them to do accurate work.

Bethlehem manufactures all types of frogs, switches, crossings and special layouts for Electric and Steam Railways; also mine track.

### A Few Bethlehem Railway Products

for Electric Railways include Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

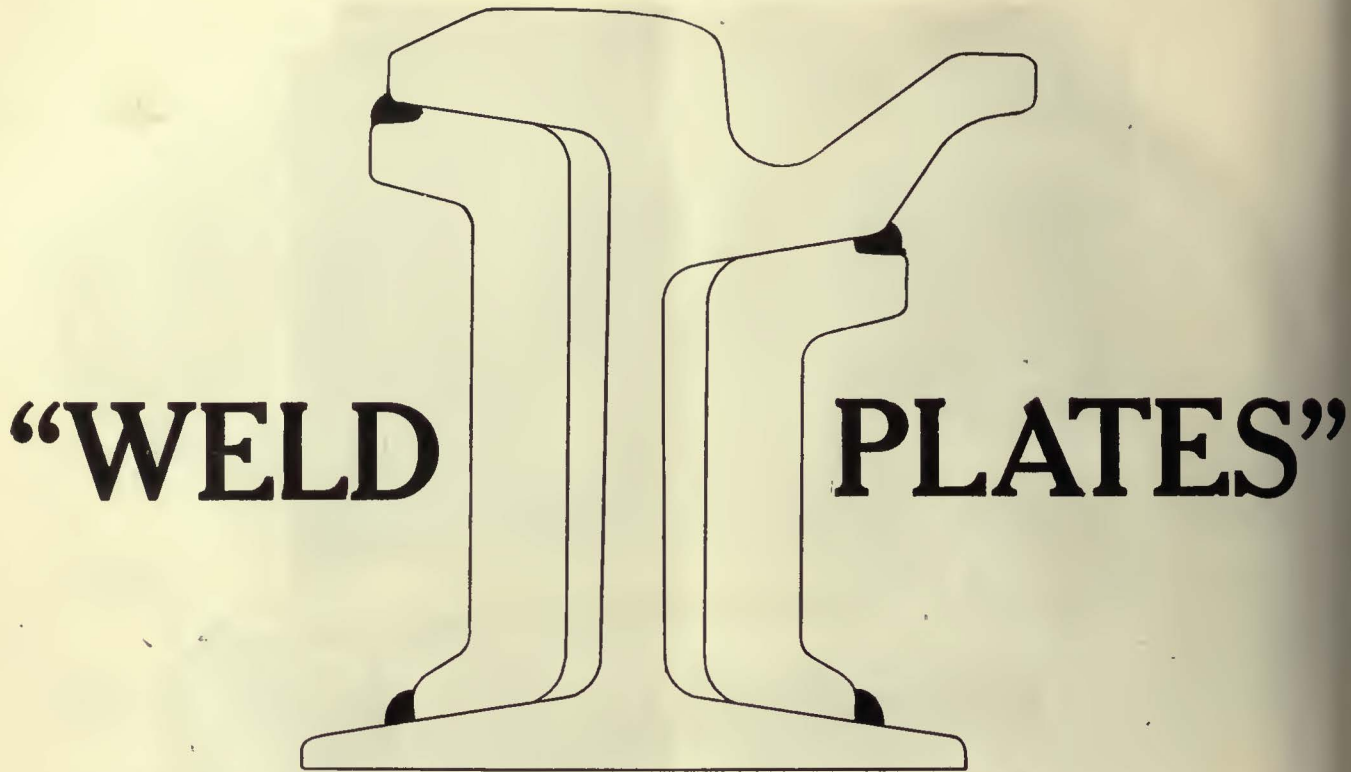
#### DISTRICT OFFICES

New York    Boston    Philadelphia    Baltimore    Washington    Atlanta    Pittsburgh  
Buffalo    Cleveland    Detroit    Cincinnati    Chicago    St. Louis    San Francisco    Seattle    Los Angeles  
Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

# BETHLEHEM

## SPECIAL TRACKWORK AND LAYOUTS





## *Modernize your welding practice!*

All you need is a trial to show that our patented "WELD PLATES" make the most efficient and economical of bar-weld joints.

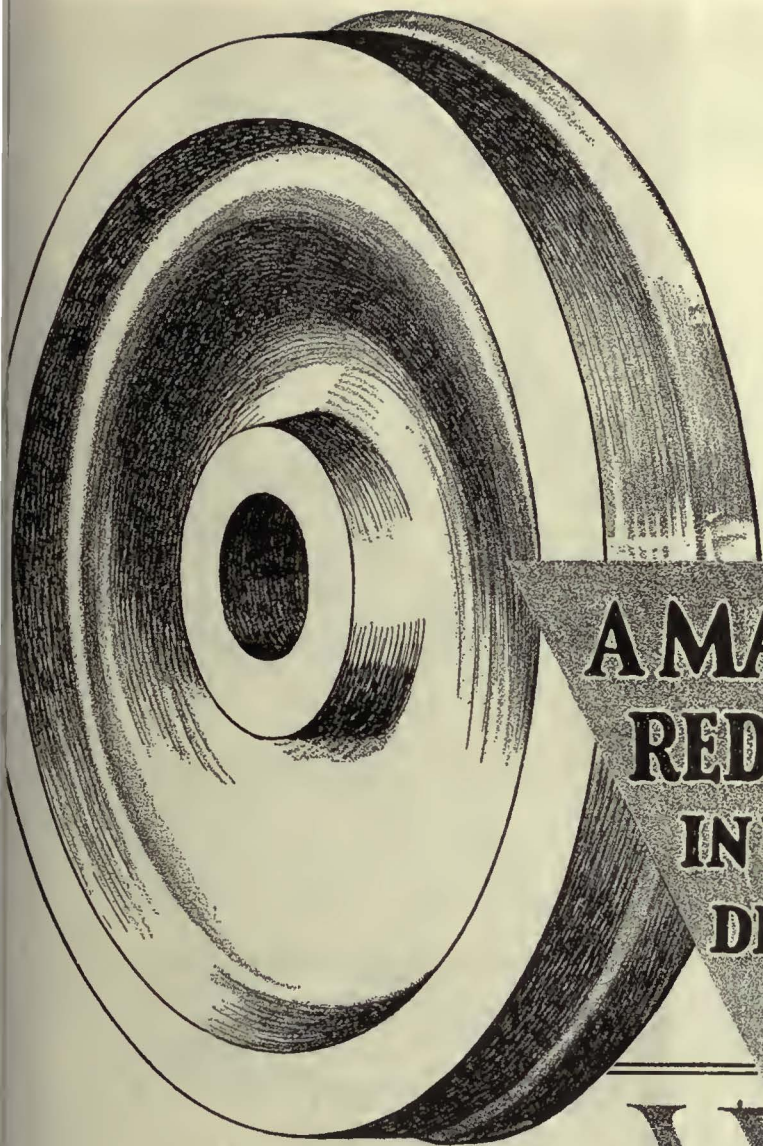
Because they are the strongest and most up-to-date plates rolled especially for electric welded joints. Note the shape—the grooves for retaining plenty of weld metal along the upper edges—the wide contact areas at top and bottom,—the suitability for the use of short bolts.

Many of them in successful use.

**The Rail Joint Company**  
61 Broadway, New York, N. Y.







**A MATERIAL  
REDUCTION  
IN WHEEL  
DEFECTS**



WHEN equipping cars with Gary Wrought Steel Wheels they not only give multiplied mileage between wheel changes, but put an end to those wheel defects which develop in wheels of softer, less durable or less homogeneous metal.

From the mine to the final product, the process of manufacture is entirely in our hands. This is the secret of the Multiplied Mileage you can count on from Gary Wrought Steel Wheels.



**Illinois Steel Company**

*General Offices*

208 S. La Salle St., Chicago, Illinois



Phone, Write, Wire



# RELAYING RAILS

## NEW RAILS

Immediate shipment from warehouse stock

**1 Ton or 1000**

All Rails and Track Materials absolutely guaranteed and shipped subject to inspection and approval at destination.

**BUY GUARANTEED RELAYING RAILS AND SAVE**

*30% TO 50%*

- New Rails
- New Splices—Bolts—Spikes
- New Frogs—Switches
- New Tie Plates—Rail Braces

CENTRALLY LOCATED WAREHOUSES

- Pittsburgh, Pa. — Jersey City, N. J.
- Hamilton, O. — Baltimore, Md.



# L-B-FOSTER CO.

PITTSBURGH, PA. - NEW YORK CITY.



# CHILLED IRON WHEELS



*There is a wheel for every service*

Highest co-efficient of Brake Shoe Friction with Minimum Loss of Brake Shoe Metal.

The hard tread becomes polished in service, reducing to a minimum wear between wheel and rail.

The soft hub insures easy machining and perfect axle fit.

**ASSOCIATION OF MANUFACTURERS  
OF CHILLED CAR WHEELS**

*1847 McCormick Building*  
**CHICAGO**

**50 PLANTS ~ DAILY CAPACITIES 20000 WHEELS**



**Partial List of Anderson  
Material for Electric  
Railways**

Insulated Bolts.  
Feeder Plugs.  
Boston Suspensions.  
Boston Straight Line  
Boston Single Curve  
Boston Double Curve.  
Boston Bracket Arm  
Boston Straight Line Twin  
Boston Single Curve Twin  
Boston Double Curve Twin  
Boston Strala Twin  
Round Top Straight Line Suspensions  
Single Curve  
Double Curve  
Bracket Arm  
Cap and Cone Suspensions  
Cap and Cone Straight Line  
Cap and Cone Single Curve  
Cap and Cone Double Curve  
Cap and Cone Barn  
Cap and Cone Bracket Arm  
Cap and Cone Twin Straight Line  
Cap and Cone Twin Single Curve  
Cap and Cone Twin Double Curve  
Suspension Types A,B,C,E,F,G,H,I,J,K  
**Insulators**  
Globe Strain  
Elephant Globe Strain  
Giant Strain  
Wood Strain  
Porcelain  
Spilt Spool  
Feeder Wire  
Section Beam  
Double Section Beam  
Double Take-Up Turnbuckles  
Turnbuckles  
Crossings  
Frogs  
Any degree  
Insulated  
2-4-5 Pull Off Rings  
Uninsulated  
Pivot Type  
Adjustable  
Removable Ears  
Removable Ears  
Draw Bridge  
Wearing Plates  
**Ears**  
Yokes  
Double Strain  
Straight Line  
Half Strain  
Single Curve  
Feeder  
Double Curve  
Clamp  
Clamp Feeder  
Curve Clamp  
Double Strain Clamp  
Half Strain Clamp  
Solder Ears  
Feeder Solder Ears  
Double Strain Solder Ears  
Straight Line Clip Ears  
Double Strain Clip Ears  
Feeder Clip Ears  
Curve Clip  
Double Center Straight Line  
Mechanical Ears  
**Strain Plates**  
Overhead Conductor  
Splicing Sleeves  
Bar Construction  
Tubular Wedge  
Terminal Clamps  
Splicing Ears  
Shackles  
Cable Splitters  
Bell Suspensions  
Come-along Clamps  
Soldering Irons  
Trolley Wire Stretchers  
Cap and Cone Tong  
Section Switches  
Disconnecting Line Switches  
Time Switches  
Tasting Clamps  
Lindall Brush Holders  
Herps  
Sleet Cutters and Wheels All Kinds  
Quick Break Switches

# A long line of ANDERSON Line Material

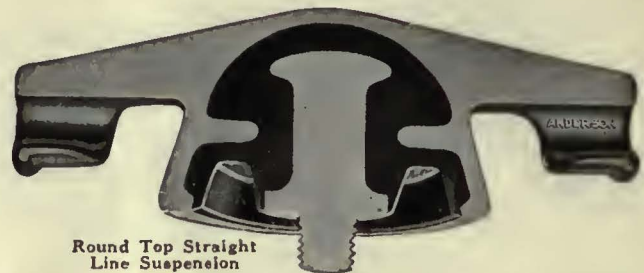
More than thirty years' experience is the basis upon which the long list of Anderson Line Material is designed and manufactured. As conditions progressed in the electric railway field so did Anderson products—so that today they represent the latest ideas in this type of equipment.

Ample stocks of standard line material are kept on hand ready for prompt delivery. Special equipment is designed and manufactured to meet any specific requirements or local conditions.

Whatever your problems may be, our engineering department will gladly cooperate with you.



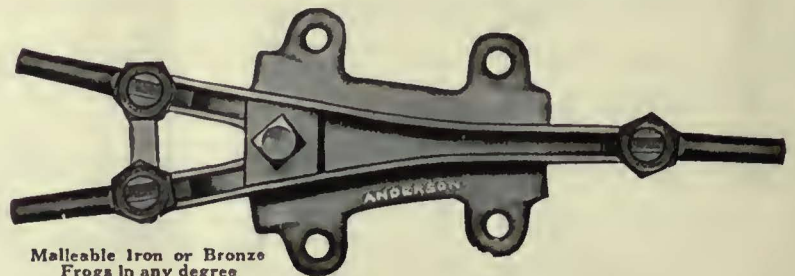
Adjustable Insulated  
Crossover.



Round Top Straight  
Line Suspension



Giant Strain Insulator



Malleable Iron or Bronze  
Frogs in any degree

Look over your stockroom; take an inventory of what you are likely to need during 1926. Take into account also your reconstruction and maintenance plans for the year. Send the list to us and we will gladly give you the latest quotations.

**Albert & J. M. Anderson Mfg. Co., 289-305 A St., Boston, Mass.**

Philadelphia—129 Real Estate Trust Bldg.

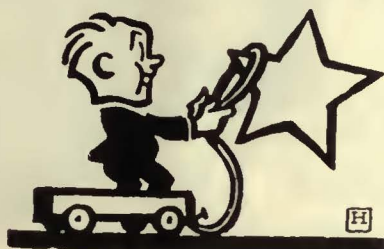
New York—135 Broadway

Chicago—105 S. Dearborn St.

London, E. C. 2, 12 Moor Lane

**Manufacturers of Line Material, Insulators, Circuit Breakers, Heavy Knife Switches,  
Automatic Time Switches, Charging Plugs and Receptacles**





## *This is what Wise Companies do!*

They hitch their cars to the Texaco Star. And their power plants, too, for that matter.

The Texas Company is lubricating completely scores of leading electric street railway lines. These lines have found that Texaco Lubricants have given them the satisfaction of reduced maintenance and better service, the satisfaction of smoother operation with lower final cost.

When we say Texaco products are completely lubricating these roads, we mean they are doing their efficient work in every part of the power plant and on every part of every car.

If your company has not learned why other roads are using *Texaco exclusively*, you should call on a Texaco engineer and go into the matter. We pride ourselves in being "Lubricating Specialists to the Electric Street Railway Field."

*There is a TEXACO LUBRICANT for Every Purpose*

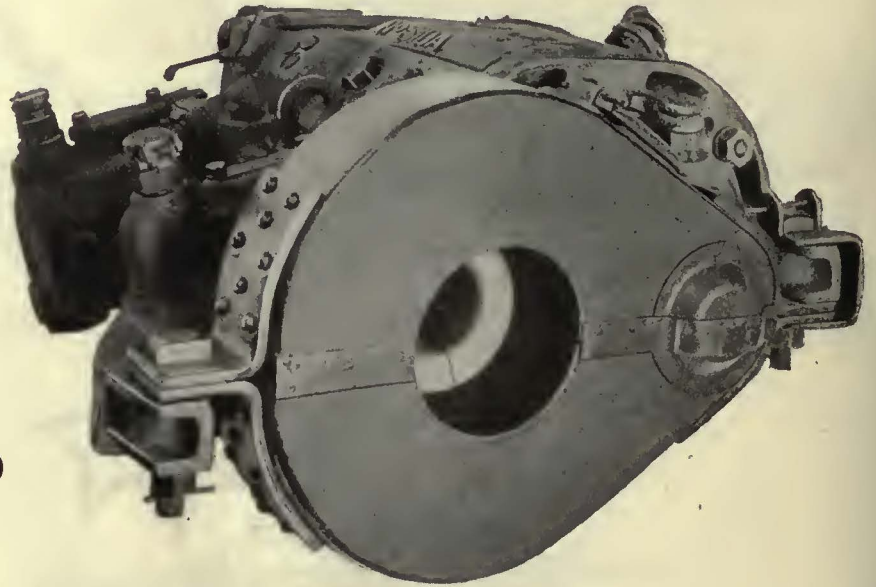


**THE TEXAS COMPANY**  
 DEPT. R-J · 17 BATTERY PLACE · NEW YORK CITY  
 HOUSTON · CHICAGO · NEW YORK  
 OFFICES IN PRINCIPAL CITIES





*For lightness—strength—low maintenance*



**GEAR CASE  
FOR W. H. 510  
MOTOR**

**CHILLINGWORTH ONE PIECE GEAR CASE**

**REPRESENTATIVES:**

J. W. Gerke  
New York

H. F. Keegan  
Chicago

Railway & Power Eng. Co.  
Canada  
Bernard Rowntree—San Francisco, Calif.

Croyden Eng. Co.  
England

E. Lewis Sales Co.  
Des Moines, Ia.

G. W. Wagner  
Detroit, Mich.

**Safety at Switches  
on high-speed lines**

*Ramapo Auto-  
matic Return  
Switch Stand  
Style No. 37*



Ramapo Automatic Return Switch Stands are used for private right-of-ways on prominent electric railways for safety over switches at passing tracks and sidings. A powerful spring allows the car to pass through switch, returning the point tightly to the original setting.

A conspicuous target indicates positively the position of the switch point, either open or closed, and reveals the danger if the point is held partially open by any obstruction.

The throw is rigid. The springs in the base fixture do not intervene between the hand lever, switch stand spindle and switch points. They are a part of the base fixture, to which the throwing mechanism is latched when the hand lever is lowered.

Made in various styles and sizes—dwarf and full height  
Styles No. 37, No. 38 and No. 39



**Switches  
Crossings**

**Frogs  
Tee-rail Construction**

**RAMAPO AJAX CORPORATION  
HILLBURN, NEW YORK**

**Works**

Hillburn, New York      East St. Louis, Ill.  
Niagara Falls, N. Y.      Pueblo, Colorado  
Chicago, Illinois      Superior, Wisconsin  
Niagara Falls, Canada

**Sales Offices at All Works; also**  
30 Church Street,      McCormick Building,  
New York      Chicago



# GRIFFIN F. C. S. Wheels

From the Standpoint of both  
*Economy* and *Safety* the  
CHILLED IRON WHEEL is  
the ideal wheel for *all classes*  
of service.



All Foundries equipped for turning  
axles, boring and mounting wheels

## GRIFFIN WHEEL COMPANY

410 No. Michigan Ave.

Chicago, Ill.

Foundries:

Chicago  
Tacoma

Detroit  
Kansas City

Denver  
Los Angeles

St. Paul

Boston  
Council Bluffs



# AMERICAN BRIDGE COMPANY

EMPIRE BUILDING, 71 BROADWAY, NEW YORK

*Manufacturers of Steel Structures of all classes, particularly*  
**BRIDGES AND BUILDINGS**

**SALES OFFICES:**

NEW YORK, N. Y. . . Empire Bldg., 71 Broadway

Philadelphia, Pa.,

Widener Bldg., N. W. Cor. Chestnut and Juniper Sts.

Boston, Mass. . . . . 120 Franklin St.

Baltimore, Md.

Continental Bldg., Cor. Calvert and Baltimore Sts.

PITTSBURGH, PA. . . Frick Bldg., 440 Fifth Ave.

Cincinnati, Ohio . . Union Trust Bldg., 36 East 4th St.

Cleveland, Ohio,

Rockefeller Bldg., 614 Superior Ave., West

Detroit, Mich. . . . Beecher Ave. and M. C. R.R.

CHICAGO, ILL. . . . . 208 South LaSalle St.

St. Louis, Mo., Liberty Central Trust Bldg., 506 Olive St.

Denver, Colo., First National Bank Bldg., 820 17th St.

Salt Lake City, Utah, Walker Bank Bldg., 175 S. Main St.

Duluth, Minn. . . . . Wolvin Bldg., 229-31 West 1st St.

Minneapolis, Minn. . . . . 629 2nd St., S. E.

*Pacific Coast Representative:*

U. S. Steel Products Co., Pacific Coast Dept.

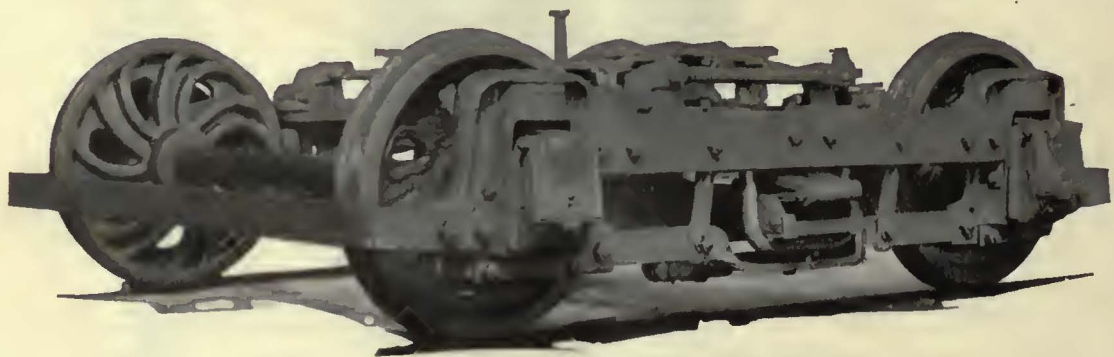
San Francisco, Cal., Rialto Bldg., 116 New Montgomery St.

Portland, Ore. . . . . Selling Bldg., 322 Adler St.

Seattle, Wash. . . . . 4th Ave., So., Cor. Conn. St.

*Export Representative: United States Steel Products Co., 30 Church St., N. Y.*

**When considering New Trucks,—  
determine the merits of the TAYLOR TRUCK**



Note the positive element of safety in the location of the one-piece bolster swing hanger over the bottom side frame member—Spring or spring plank cannot drop and cause derailment.

**TAYLOR ELECTRIC TRUCK CO., TROY, N. Y.**  
*Truck and Spring Manufacturers*



# "HOFFMANN"

Motor bearing upkeep is a serious item, as you know. "Hoffmann" Precision Roller Bearings minimize it—not only because of their rugged strength but also because they can be mounted with magazine lubrication that needs renewal only at long intervals.

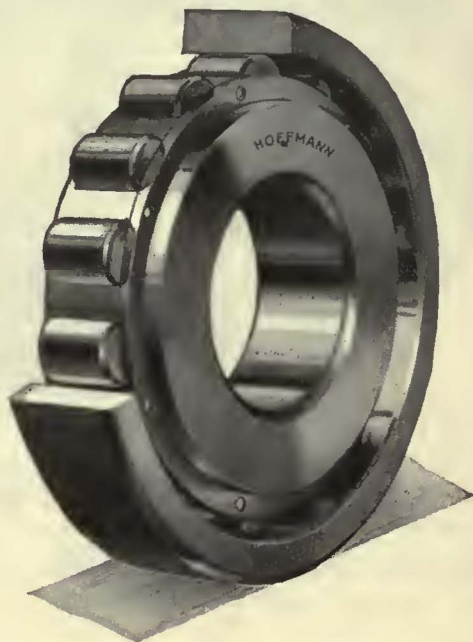
There's the tremendous steady load capacity you need — the large temporary overload capacity you've wished you could have — the rugged strength and simplicity that stand shock, jar and vibration—the precision that makes the "Hoffmann" a true anti-friction bearing.

*Our engineers are ready to meet yours, with convincing facts proving that you will save money and get more mileage per motor bearing, by equipping your traction motors with "Hoffmanns."*

**NORMA-HOFFMANN  
BEARINGS CORPORATION**

Stamford — Connecticut

PRECISION BALL, ROLLER AND THRUST BEARINGS



## PRECISION ROLLER BEARINGS



**I**N 1926 we celebrate our sixtieth year of service to the industry.

During this period we have matched stride for stride the general progress of the industry so that today we can offer expert advice as Axle Specialists.

The test of time has proved the value of our products, and the advantages of our prices.

*Ask us for quotations on your specifications.*

**J. R. JOHNSON & CO., Inc.**

*Axle Specialists Since 1866*

Address all mail to P. O. Box 515, Richmond, Va.

Railroad and Electric Car Axles.  
Forged Steel Axles for:  
Locomotives; Passenger, Freight  
and Electric Service.  
Piston Rods.  
Crank Pins.  
Steel Worm and Gear and Pinion  
Blanks.  
Large Shafts and Bars.  
Smooth Forged, or Rough Turned, or  
Finished Turned, Carbon or Alloy  
Steel.  
Plain or Heat Treated.





# Accurate Quick Permanent

**T**HE sale of transportation is strictly a retail proposition and should comply with those methods which have been found most successful in other lines of merchandising.

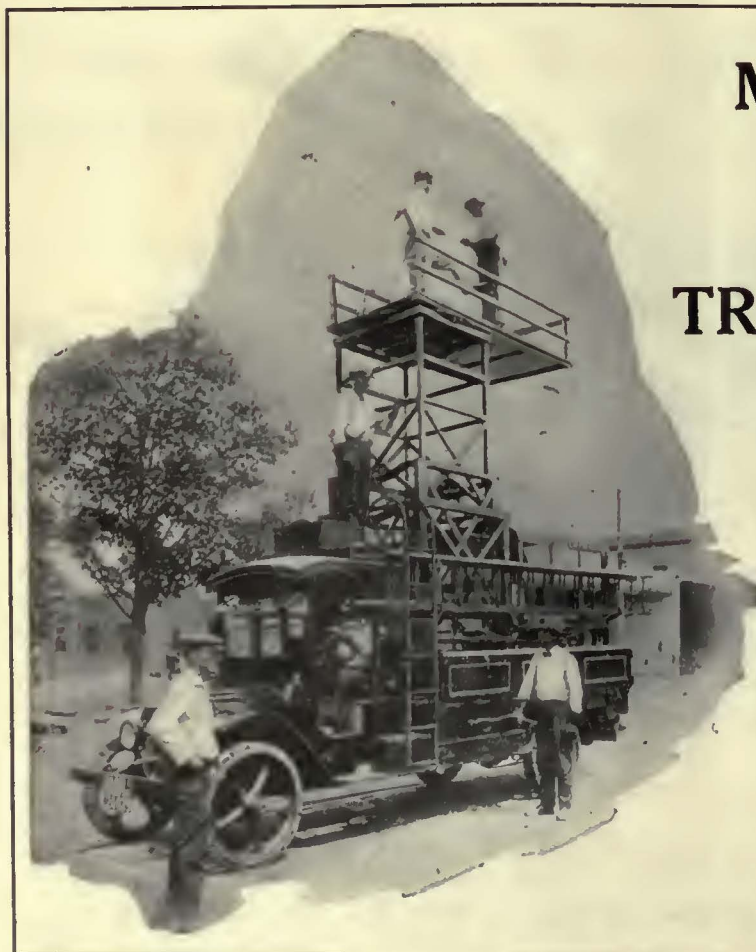
Ohmer Fare Registers indicate and record the exact amount and class of each fare paid.

They apply to electric railway and motor bus operation those methods which have brought success to countless retail merchants.

We manufacture Ohmer Fare Registers, Ohmer Taximeters, Atco Taximeters, Ohmer Odometers, Ohmer Fare Boxes, and Ohmer Recordographs.

## OHMER FARE REGISTER COMPANY

Dayton, Ohio, U. S. A.



## Maintenance with McCardell's 3-section TRENTON TOWERS

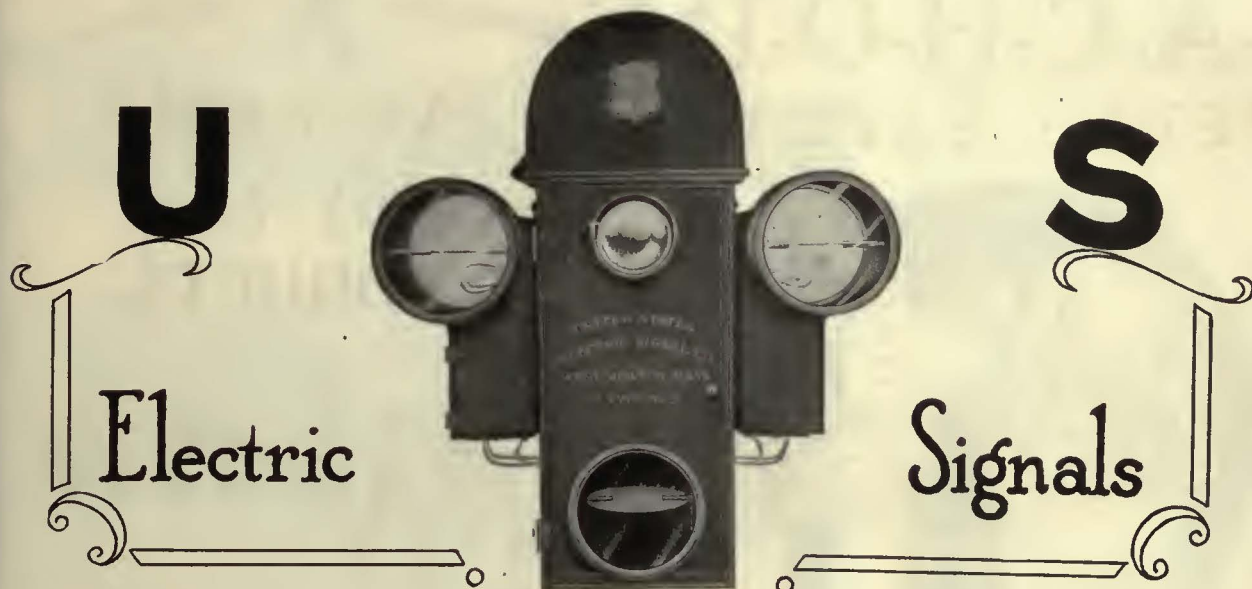
Shown at the left is one of the latest types of Trenton Towers, which affords the greatest possible range of height—11 ft. 6 in. over-all when collapsed, to 22 ft. (ground to platform) when fully extended. Especially adapted, on account of its great height, to painting and other maintenance or emergency work on poles. Hoisting controls located at driver's seat. Adapted to both electric and gasoline-driven trucks—any standard make chassis.

Trenton Towers are built with sturdy, well-designed sections, made to afford a firm substantial footing for workmen when fully extended.

EST. 1884

**J. R. McCARDELL CO.**  
TRENTON, N. J., U. S. A.





### For Safe, Speedy Service

For over 25 years United States Electric Signals have been the standard of safety for many electric railway companies. They are depended upon to provide safe and speedy service —as these signals have always proved reliable under typical service conditions.

Incorporated in Type K-2, shown above, is every up-to-

date safety feature. A red light for night and a red disc for day provide double stop indications. Signal lenses are 5 in.—discs 8 in.

Duplicate lighting. Counting in-and-out feature up to 15 cars.

*For further particulars write us today.*

**UNITED STATES ELECTRIC SIGNAL CO., LOUISVILLE, KENTUCKY**

Representatives: Western: Frank F. Bodler, Monadnock Bldg., San Francisco.  
Foreign: Forest City Electric Co., Manchester, Eng.

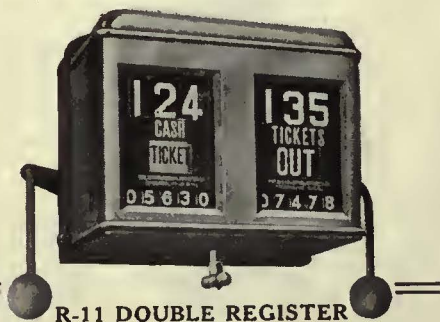
## CAR RECEIPTS AT A GLANCE

*with*

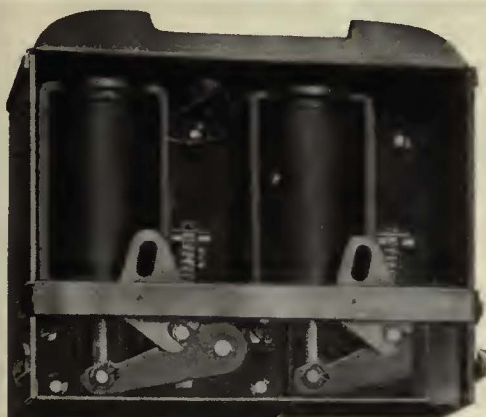
### International Fare Registers

Single and double

*Instantaneous—Accurate*



R-11 DOUBLE REGISTER



B-12 ELECTRIC BACK

A thoroughly modern fare registration system that wins the confidence of not only the public, but also the car operator and the accounting department. International Registers may be furnished with electrical or mechanical, hand or foot control.

Write now for our Catalog. Then equip your new cars with "Internationals."

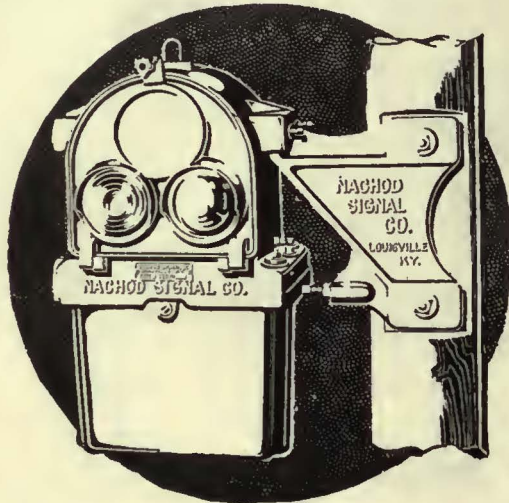
*General Selling Agents for*  
**HEREEN ENAMEL BADGES**

## The International Register Company

No. 15 South Throop Street, Chicago, Ill.



# N-A-C-H-O-D SPELLS SAFETY



*Nachod Automatic Block Signals* are extremely simple to install, to operate and to maintain. They are controlled from overhead contactors, give duplicate indications of colored lights and disks—visible day or night under all weather conditions.



*Nachod Crossing Signals* give three kinds of warning. They ring a bell, swing a wig-wag, or flash lights. The most careless drivers will stop at these signals.

*Nachod Headway Recorders* provide an efficient check on actual headways, 24 hours a day, at any points on your lines. They are a great aid in maintaining regular schedules.

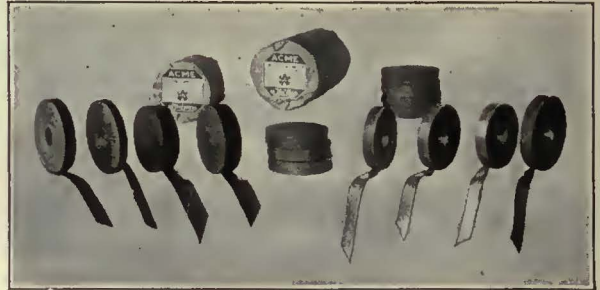


*Write for full particulars.*

**Nachod Signal Company, Inc.**  
Louisville, Kentucky



## ACME WIRE PRODUCTS



### BIAS CAMBRIC TAPES FOR SHOP USE

The man in the shop is the best judge of tapes. We make them to suit him. In the Sewed Bias Tape, the stitching is finer and the butted seam thinner. We need only 48 seams in a 72-yard roll. Some tapes have as many as 55!

The Acme sewed seams are so thin they do not need to be cut out.

Acme Seamless Bias Tape comes in any width and in thicknesses from .007 in. to .015 in.; rolls of 72 yards all one piece of cloth, or special length rolls where required.

Acme Varnished Cambric Tapes are made in either yellow or black, and with dry, tacky or greasy finish.

**Ask for Catalog 3J**

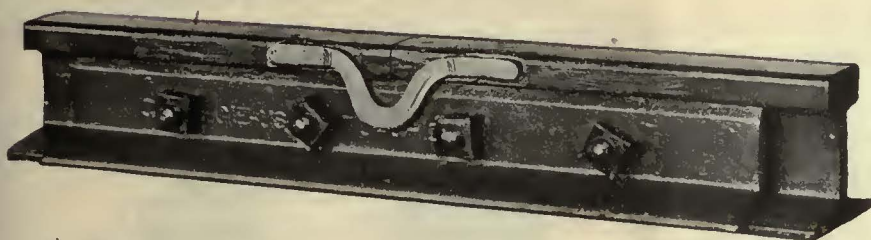
*It contains tables and complete data on Varnished Insulations.*

**THE ACME WIRE CO.**  
Main Office and Plant  
NEW HAVEN, CONN.

New York  
52 Vanderbilt Ave.  
Boston  
80 Federal Street

Chicago  
427 West Erie St.  
Cleveland  
Guardian Bldg.





**Upper illustration.**  
Type EA Brazed bond, with laminated copper conductor. Well adapted for bonding thin ball of light, or girder rail. See Circular No. 12 for sizes and other types of Brazed Bonds.

**Lower illustration.**  
Type ATF Arc Weld bond, with forged steel terminals and twin cable conductor. For arc weld bonding of the ball of rail of 60 lbs. or over. Circular No. 13 covers the various sizes of this and other arc weld bonds.



*Before you begin your spring bonding write us for better and lower cost bonding methods.*

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

*Simple  
Sure  
Inexpensive*

The application of ERICO rail bonds is made by simple apparatus, thru a simple method, and the quality of the job is easily ascertained as the work progresses, by simple, visual means.

This simplicity assures uniform and reliable bonding—the results are “sure fire” each time. The bonding is both permanently conductive and mechanically strong.

Carefully designed ERICO bonding equipment and a standardized method eliminate all interference with car schedules and reduce the total time required for bonding. Owing to the initial low price of ERICO bonds, the non-interference with traffic, and the rapidity of application, the installed cost per bond is surprisingly low.



# Miami rides on Thomas Cars

With thousands of people pouring into Florida, transportation facilities had to be expanded.

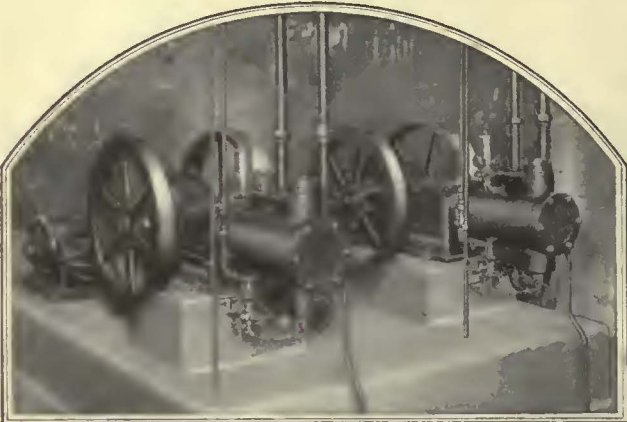
To meet this demand for increased service the Miami Beach Railway Company recently ordered twelve new Thomas Cars of the type shown above.

Our facilities enable us to make prompt deliveries of Thomas Cars to other electric railways having similar service requirements.

*Your specifications will receive our closest attention. Ask for quotations.*

**PERLEY A. THOMAS CAR WORKS**  
High Point, N. C.





*Depend upon*  
**Sullivan "WG-6"**  
**Air Compressors**

SULLIVAN air power engineers have made the "WG-6" small, belted compressors sturdy, dependable, almost automatic, so simple that they are seldom "out of order," but with the same quality built into them in design, in materials, and in painstaking workmanship, that distinguishes the largest and most costly Sullivan compressors.

Hundreds of new "WG-6's" are installed every year, and give their owners steady, dependable service, in the shop or on the construction job.



Sullivan Wafer Valve and Spring, with assembly on seat in center

**Sullivan "Wafer" Valves**

are one element in "WG-6" satisfaction.

Light, thin steel discs, held to their seats by flat springs of the same material, form the valves of Sullivan "WG-6" compressors.

Wide, short, port openings, lightness, low lift, simplicity and long life are "Wafer" valve features.

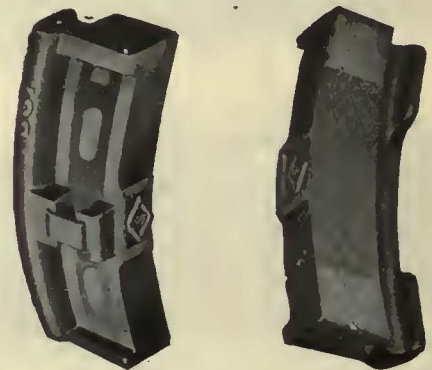
Capacities, 68-500 cu. ft.

**Bulletin 3277-K**

*Portable Air Compressors in desirable capacities and drives are described in Bulletin 3277-N*



**BRAKE SHOES**  
**AERA Standards**  
**Brake Heads**



Diamond "S" Steel Back and Lug Shoes best for all equipment.

Manufactured and sold under U. S. Patent and Registered Trade Mark.

**American Brake Shoe and Foundry Co.**  
**30 Church Street, New York**  
 332 So. Michigan Ave., Chicago

T. S. Q.  
*says*

*"I save repair costs."*

**Tool Steel Quality**

The Tool Steel  
 Gear and Pinion Co.  
 CINCINNATI, O.



*You're having brush trouble*

**CORRECT IT**

**USE LE CARBONE CARBON BRUSHES**

*They talk for themselves*

**COST MORE PER BRUSH  
COST LESS PER CAR MILE**

**W. J. Jeandron**

Hoboken Factory Terminal,  
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.  
Chicago Office: 1657 Monadnock Block  
San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd.,  
Montreal and Toronto



**KERITE**  
in a half-century of  
*continuous production*,  
has spun out a record  
of performance  
that is  
*unequalled* in the  
history of insulated  
wires and cables

THE KERITE INSULATED WIRE & CABLE COMPANY INC  
NEW YORK CHICAGO



**DON'T  
REMOVE  
WORN  
WHEELS**

This shoe does the work while your car is in service.

**SAVES TIME—SAVES LABOR—  
SAVES MONEY**

WHEEL TRUING BRAKE SHOE CO.  
Detroit, Mich.

**Lorain Special Trackwork  
Girder Rails**

*Electrically Welded Joints*

**THE LORAIN STEEL COMPANY**  
Johnstown, Pa.

*Sales Offices:*

Atlanta	Chicago	Cleveland	New York
	Philadelphia	Pittsburgh	
	<i>Pacific Coast Representative:</i>		
	United States Steel Products Company		
Los Angeles	Portland	San Francisco	Seattle

*Export Representative:*  
United States Steel Products Company, New York, N. Y.



**Cold Dinners**

for your passengers?

Not if you use

**AJAX**

**BABBITT for ARMATURES**

*keeps the rolling stock rolling*



**The Ajax Metal Company**

Established 1880

**PHILADELPHIA**

NEW YORK CHICAGO BOSTON CLEVELAND



Whenever you need

poles, ties or switch timbers, we offer you a reliable source of supply.

# LIVE CHESTNUT POLES

30, 35 and 40 ft. lengths

## COOK TIE & POLE COMPANY

Commercial Trust Building, PHILADELPHIA, PA.

Let us quote

on all your requirements—as we can give you both fair prices and quick deliveries.



Use only Awebco Tape on your Armatures Field Coils have better protection when wound with "AWEBCO Tape." Send for samples.

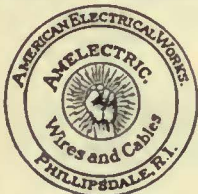
**ANCHOR WEBBING COMPANY**  
300 Brook Street, Pawtucket, Rhode Island

## Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley Wheels and Harps has been demonstrated by large and small electric railway systems for a period of thirty years. Being exclusive manufacturers, with no other lines to maintain, it is through the high quality of our product that we merit the large patronage we now enjoy. With the assurance that you pay no premium for quality we will appreciate your inquiries.



**THE STAR BRASS WORKS**  
KALAMAZOO, MICH., U. S. A.



Reg. U. S. Pat. Office  
Incandescent Lamp Cord

**AMELECTRIC PRODUCTS**  
BARE COPPER WIRE AND CABLE  
TROLLEY WIRE  
WEATHERPROOF WIRE AND CABLE  
PAPER INSULATED UNDERGROUND CABLE  
MAGNET WIRE

**AMERICAN ELECTRICAL WORKS**  
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 112 W. Adams;  
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

## ELRECO TUBULAR POLES



COMBINE

**Lowest Cost**                      **Lightest Weight**  
**Least Maintenance**           **Greatest Adaptability**

Catalog complete with engineering data sent on request.

**ELECTRIC RAILWAY EQUIPMENT CO.**  
CINCINNATI, OHIO  
New York City, 30 Church Street



Electric Railway  
**AIMco** Automatic Signals

for Accessibility and Reliability

EST. 1888      **AIMco**      INC. 1918  
**"American"**  
**INSULATING**  
**MACHINERY**  
COMPANY

Philadelphia, New York, Paris, England

Sales Agents:  
**Electric Service Supplies Co.**  
Philadelphia      New York      Chicago



## Important Factors of "Ideal" Trolley Wheels

Of the many important factors two are outstanding: the light soft-stamped, low carbon steel flanges which take the wear and tear of side thrust on the wire—and the integral cast copper-tin alloy contact ring and hub which provides for current collection with minimum resistance.

These wheels insure greater mileage, closer following of wire at high speed, and smooth, silent running.

Request complete information—also sample for test purposes.

Sales Representatives  
R. D. Nuttall Co.  
Pittsburgh, Pa.  
Also all Westinghouse  
E. & M. Co. and  
General Electric Co.  
District Offices.

**Edward P. Sharp**

L. E. Harmon, Prop.  
27-31 Mechanic St., Buffalo, N. Y.



# THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of  
Water Tube Boilers  
of continuing reliability

Makers of Steam Superheaters  
since 1898 and of Chain Grate  
Stokers since 1893



WORKS  
Bayonne, N. J.  
Barberton, Ohio

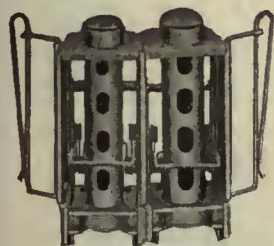
BRANCH OFFICES

BOSTON, 49 Federal Street  
PHILADELPHIA, Packard Building  
PITTSBURGH, Farmers Deposit Bank Building  
CLEVELAND, Guardian Building  
CHICAGO, Marquette Building  
CINCINNATI, Tracton Building  
ATLANTA, Candler Building  
PHOENIX, ARIZ., Heard Building  
DALLAS, TEX., 2001 Magnolia Building  
HONOLULU, H. T., Castle & Cooke Building  
PORTLAND, ORE., 805 Gasco Building

BRANCH OFFICES

DETROIT, Ford Building  
NEW ORLEANS, 521-5 Baronne Street  
HOUSTON, TEXAS, 1011-13 Electric Building  
DENVER, 435 Seventeenth Street  
SALT LAKE CITY, 405-6 Kearns Building  
SAN FRANCISCO, Sheldon Building  
LOS ANGELES, 404-6 Central Building  
SEATTLE, L. C. Smith Building  
HAVANA, CUBA, Calle de Aguiar 104  
SAN JUAN, Porto Rico, Royal Bank Building

## JOHNSON Universal Changer



Adjustable

The best changer on the market. Can be adjusted by the conductor to throw out a varying number of coins, necessary to meet changes in rates of fares.

Flexible

Each barrel a separate unit, permitting the conductor to interchange the barrels to suit his personal requirements, and to facilitate the addition of extra barrels.

JOHNSON FARE BOX COMPANY

Ravenswood, Chicago, Ill.

## Instantaneous Registration by the Passenger ROOKE of fare collection SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register portable or stationary, at option. Handles nickels, dimes, quarters, or metal tickets, in any combination, FLEXIBILITY with CERTAINTY.



Rooke Automatic Register Company Providence, R. I.



## FARE BOXES for BUSES

Let us tell you of this especially designed box for this class of service.

The Cleveland Fare Box Co.  
4900 Lexington Ave., Cleveland, O.  
Canadian Cleveland Fare Box Co., Ltd.  
Preston, Ontario

COIN COUNTING And Sorting Machines CHANGES CARRIERS Tokens

## HIGH SPEED CHANGE CARRIERS

1925 model—without rivets—ready for delivery



Supplied in one or four tube Combinations

Essential wherever the rapid and accurate handling of change is required. Now included in the standard equipment of largest Traction Companies because conductors demand them.

Prices and Literature sent on request

J. L. GALEF, 75 Chambers St., N. Y. C.  
Exclusive Manufacturer's Selling Agent



## We make a specialty of ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULC on your equipment

The Universal Lubricating Co.

Cleveland, Ohio  
Chicago Representatives: Jameson-Ross Company, Straus Bldg.

B. A. HEGEMAN, Jr., President  
H. A. HEGEMAN, Vice-Pres. and Treas.  
W. C. PETERS, Manager Sales and Engineering

C. C. CASTLE, First Vice-President  
F. T. SARGENT, Secretary  
C. C. CASTLE, First Vice-President

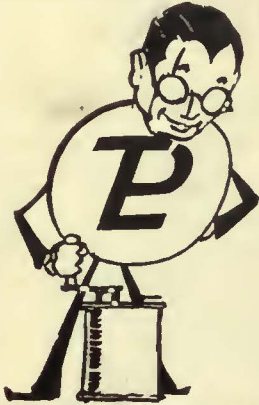
## National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York  
Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.  
Hegeman-Castle Corporation, Railway Exchange Building, Chicago.

### RAILWAY SUPPLIES

- Tool Steel Gears and Pinions
- Bell Locked Fare Box and Change Maker
- The Aluminum Field Collie
- Walter Tractor Snow Plows
- Cutter-Hammer Electric Heaters
- Genesco Paint Oils
- Garland Ventilators
- Flaxlinum Insulation
- Yellow Coach Mfg. Co.'s Single and Double Deck Busees.
- B. G. Spark Plugs
- Economy Electric Devices Co.'s Power Saving and Inspection Meters
- Anglo-American Varnish Co., Varnishes, Enamels, etc.
- National Hand Holds
- Ft. Pitt Spring & Mfg. Co., Springs
- Anderson Slack Adjusters
- Feasible Drop Brake Staffs
- Dunham Hopper Door Devices





# There's more to a car than the Controller

Every part that goes into the assembly of your electric cars should be carefully inspected and tested to make sure they function properly and meet your exacting specifications. P. T. L. Inspectors, located in the large industrial centers, are thoroughly familiar with your service requirements and guarantee a rigid inspection and test of every item entering into the manufacture and assembly of your purchases.

Bulletin No. 28 tells how we do it in detail. Write to-day.

## PITTSBURGH TESTING LABORATORY

PITTSBURGH

Inspecting Engineers and Chemists

PENNA.

Branch Offices in the Principal Cities



### ROEBLING

WELDING CABLE

ELECTRICAL WIRES and CABLES

John A. Roebling's Sons Company, Trenton, N. J.

## Chapman Automatic Signals

Charles N. Wood Co., Boston



100 New Users in the Last Nine Months  
**KASS SAFETY TREADS**

HIGH

in efficiency and lasting qualities

LOW

in weight, initial and upkeep costs

Morton Manufacturing Co., Chicago

## NAUGLE POLES

WESTERN & NORTHERN CEDAR

NAUGLE POLE & TIE CO.

59 E. MADISON ST. CHICAGO ILL.

New York - Columbus - Kansas City - Spokane - Vancouver - Boston



Standard Underground Cable Co.

General Offices Pittsburgh, Pa. Branches in all principal cities



## Car Heating and Ventilation

are two of the winter problems that you must settle without delay. We can show you how to take care of both, with one equipment. Now is the time to get your cars ready for next winter. Write for details.

The Peter Smith Heater Company

6209 Hamilton Ave., Detroit, Mich.

## Northern CEDAR POLES Western

We guarantee

all grades of poles; also any butt-treating specifications

**BELL LUMBER COMPANY**

Minneapolis, Minn.

## INDUSTRIAL GASES

OXYGEN ACETYLENE



HYDROGEN NITROGEN

Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

International Oxygen Co., Main Offices: Newark, N. J.

Branches: New York Pittsburgh Toledo



ELECTRIC CAR HEATERS  
THERMOSTATS BUZZERS  
PNEUMATIC DOOR OPERATORS

CONSOLIDATED CAR-HEATING CO.  
NEW YORK ALBANY, N.Y. CHICAGO

"Your Air Pumps will work better and cheaper" when equipped with

**EVER-TYTE Piston Rings**

EVER-TYTE PISTON RING DIV.

ST. LOUIS

## A Single Segment or a Complete Commutator

is turned out with equal care in our shops. The orders we all differ only in magnitude; small orders command our 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



## STUCKI SIDE BEARINGS

A. STUCKI CO.  
Oliver Bldg.  
Pittsburgh, Pa.



# SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.  
Positions Vacant and all other classifications, 8 cents a word, minimum charge \$3.00.  
Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.  
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....\$4.50 an inch  
4 to 7 inches..... 4.30 an inch  
8 to 14 inches..... 4.10 an inch  
Rates for larger spaces, or yearly rates, on request.  
An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

## POSITIONS WANTED

**ENGINEER** of twenty years' experience in construction and maintenance of paved and open track, overhead lines and buildings, desires position as engineer of way. PW-876, Electric Railway Journal, Real Estate Trust Bldg., Phila., Pa.

**SUPERINTENDENT** transportation, qualified by a wide experience and successful record on large city and interurban properties; successful in handling labor. Public relations, safety campaigns, etc., recognized as an efficient, progressive official fully capable of getting results. At present engaged. Personal reasons for desiring change. High-class references from leading executives. Correspondence invited. PW-858, Electric Railway Journal, 401 Guardian Bldg., Cleveland, Ohio.

## WANTED CARS

16 second-hand, 4 ft. 8½ in. gauge, seating about 48 passengers, complete with electrical equipment.

HENRY LEVIS & CO.  
Commercial Trust Bldg., Philadelphia, Pa.

## WANTED TO BUY BIRNEY CARS

2—Prefer Brill Cars with West. 508 motors, in first class condition.

THE UNION TRACTION COMPANY  
Coffeyville, Kansas

**Rails** We Buy and Sell entire equipment of Electric Railways, including Rails, Cars, Wiring, Conduits, Etc.

Get Our Bids or Ask for Prices

**Hyman-Michaels Company**  
Peoples Gas Bldg., Chicago  
New York St. Louis Pittsburgh  
San Francisco Dallas (76)

## 4 High Grade! High Speed! Combination 56-Passenger (Smoking and Baggage Sections) Cars

Exceptionally good cars for Interurban Service

All in excellent condition. Built by Kuhlman. Length over all, 57 ft. Height over trolley board, 12 ft. 5 in. Height over all, 13 ft. 10 in. Number of seats, 26. Seating capacity, 50. Type of motors, four G. E. 205. Make of trucks, Brill. Wheels base, 7 ft. Controller, G.E.—MC—74. Toilets, 34-in.x36-in. Air Compressor, WHD 2.

Also four 48 passenger cars and smaller cars for one- or two-man operation.  
Complete details on request.

J. W. GERKE, Railway Equipment, 303 Fifth Ave., N. Y.



## FOR SALE

20—Birney Safety Cars, Brill built. Seating 32.  
8—Steel Interurbans, 48 ft. long. Seating 52.

ELECTRIC EQUIPMENT CO.  
Commonwealth Bldg., Philadelphia, Pa.

## BARGAIN PRICE

## Steel Cars

Four practically new one-man light weight double truck—26 inch wheels—quadruple 25 H.P. Motors—DH16 Air Compressors.

Wire or Phone

Transit Equipment Company  
Cars—Motors  
501 Fifth Ave., New York City

## The SEARCHLIGHT Advertising in This Paper

is read by men whose success depends upon thorough knowledge of means to an end—whether it be the securing of a good second-hand piece of apparatus at a moderate price, or an expert employee.

## The Best Proof

of this is the variety of this journal's Searchlight ads. Without a constant and appreciable demand for such machinery or service, by its readers, the market-place which these advertisements represent could not exist for any length of time.

Are you using the Searchlight Section?



**Advertising, Street Car**  
Collier, Inc., Barron G.

**Air Brakes**  
Christensen Air Brakes Co.

**Air Circuit Breakers**  
Roller-Smith Co.

**Air Receivers & Aftercoolers**  
Ingersoll-Rand Co.

**Ammeters**  
Roller-Smith Co.

**Anchors, Guy**  
Elec. Service Supplies Co.  
Graybar Electric Co., Inc.  
Ohio Brass Co.  
Westinghouse Elec. & M. Co.

**Appraisals**  
Amer. Appraisal Co.

**Armature Shop Tools**  
Elec. Service Supplies Co.

**Automatic Door Equipment**  
Manganese Steel Forge Co.

**Automatic Return Switch**  
Stand

Ramapo Ajax Corp.

**Automatic Safety Switch**  
Stand

Ramapo Ajax Corp.

**Automobile Trucks**  
General Motors Truck Co.

**Axles**  
Illinois Steel Co.  
Johnson & Co., J. R.  
Shuler Axle Co.  
Standard Steel Works  
St. Louis Car Co.  
Taylor Electric Truck Co.

**Axles, Carbon Vanadium**  
Johnson & Co., J. R.

**Axles, Car Wheel**  
Bemis Car Truck Co.  
Bethlehem Steel Co.  
Brill Co., The J. G.  
Carnegie Steel Co.  
Johnson & Co., J. R.  
Taylor Electric Truck Co.  
Westinghouse Elec. & M. Co.

**Axles, Front & Rear, Motor**  
Truck & Passenger Car  
Timken-Detroit Axle Co.

**Axles, Rear**  
Clark Equipment Co.

**Axles, Steel**  
Carnegie Steel Co.  
Johnson & Co., J. R.

**Axles, Trailer & Motor Run**  
Timken-Detroit Axle Co.

**Bridges and Bottoms**  
Elec. Service Supplies Co.  
International Register Co.  
The

**Babbitting Devices**  
Columbia Machine Wks.

**Babbitt Metal**  
Ajax Metal Co.

**Burges, Steel**  
American Bridges Co.

**Batteries, Dry**  
National Carbon Co.  
Nichols-Lintner Co.

**Bearings, Roller and Ball**  
Norma Hoffman Bearing Co.  
S. K. F. Industries

**Bearings and Bearing Metals**  
Ajax Metal Co.  
Columbia Machine Wks.  
General Electric Co.  
More Jones Brass & Metal  
Co.

St. Louis Car Co.  
Taylor Electric Truck Co.  
Westinghouse Elec. & M. Co.

**Bearings, Center and Roller**  
Side

Stueckl Co., A.

**Bearings, Roller**  
Hyatt Roller Bearing Co.

**Bells and Gongs**  
Brill Co., The J. G.  
Columbia Machine Wks.  
Consolidated Car Heating  
Co.  
Elec. Service Supplies Co.  
Graybar Electric Co., Inc.  
St. Louis Car Co.

**Benders, Roll**  
Railway Track-work Co.

**Body Material, Inskelite &**  
Hymel  
Inskelite Mfg. Corp.

**Rollers**  
Babcock & Wilcox Co., The

**Roller Hanger Wear Plates**  
Manganese Steel Forge Co.

## WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry  
with Names of Manufacturers and Distributors Advertising in this Issue

**Bolts, Nuts, Rivets**  
Russell Burdall & Ward  
Bolt & Nut Co.

**Bolts and Nuts, Track**  
Illinois Steel Co.

**Bond Testers**  
Amer. Steel & Wire Co.  
Elec. Service Supplies Co.  
Roller-Smith Co.

**Bonding Apparatus**  
Amer. Steel & Wire Co.  
Elec. Ry. Improvement Co.  
Elec. Service Supplies Co.  
Graybar Electric Co., Inc.  
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.  
Graybar Electric Co., Inc.  
Ohio Brass Co.  
Railway Track-work Co.  
Una Welding & Bonding Co.  
Westinghouse Elec. & M. Co.

**Book Publishers**  
McGraw-Hill Book Co.

**Brackets and Cross Arms**  
(See also Poles, Ties, Posts  
etc.)  
American Bridge Co.  
Bates Expanded Steel Truss  
Co.  
Elec. Ry. Equipment Co.  
Elec. Service Supplies Co.  
Graybar Electric Co., Inc.  
Hubbard & Co.  
Ohio Brass Co.

**Brake Adjusters**  
Nat'l Ry. Appliance Co.  
Westinghouse Tr. Br. Co.

**Brake Shoes**  
Amer. Brake Shoe & Fdry.  
Co.  
Bemis Car Truck Co.  
Brill Co., The J. G.  
St. Louis Car Co.  
Taylor Electric Truck Co.  
Wheel Truing Brake Shoe  
Co.

**Brakes, Brake Systems and**  
Brake Parts  
Brill Co., The J. G.  
Columbia Machine Wks.  
General Electric Co.  
National Electric Co.  
Safety Car Devices Co.  
St. Louis Car Co.  
Taylor Electric Truck Co.  
Westinghouse Tr. Br. Co.

**Bridges, Steel**  
American Bridge Co.

**Brushes, Carbon**  
General Electric Co.  
Jeandron, W. J.  
Le Carbone Co.  
Morganite Brush Co.  
National Carbon Co.  
Westinghouse Elec. & M. Co.

**Brushes, Graphite**  
Morganite Brush Co.  
National Carbon Co.

**Brushes, Wire, Pneumatic**  
Ingersoll-Rand Co.

**Brush Holders**  
Anderson Mfg. Co., A. &  
J. M.

**Bulkheads**  
Haskelite Mfg. Corp.

**Bunkers, Coal**  
American Bridge Co.

**Bus Bodies**  
Anheuser Busch

**Bus Seats**  
Heywood-Wakefield Co.

**Buses, Motor**  
Auto Body Co.  
Brill Co., The J. G.  
Graham Bros.  
International Harvester Co.  
Mack Trucks  
St. Louis Car Co.  
Yellow Coach Mfg. Co.

**Busings, Case Hardened and**  
Manganese  
Brill Co., The J. G.  
St. Louis Car Co.

**Cables**  
(See Wires and Cables)

**Cambric Tapes, Yellow &**  
Black Varnish  
Irvington Varnish & Ins. Co.

**Cambric Yellow & Black**  
Varnish  
Mica Insulator Co.

**Carbon Brushes**  
(See Brushes, Carbon)

**Car Lighting Apparatus**  
Elec. Service Supplies Co.

**Car Mfrs. Ass'n**  
Railway Car Mfrs. Ass'n.

**Car Panel Safety Switches**  
Consolidated Car Heating  
Co.  
Westinghouse Elec. & M. Co.

**Car Steps, Safety**  
Irving Iron Works

**Car Wheels, Rolled Steel**  
Bethlehem Steel Co.

**Cars, Dump**  
Differential Steel Car Co.,  
Inc.  
St. Louis Car Co.

**Cars, Gas Rail**  
St. Louis Car Co.

**Cars, Passenger, Freight**  
Express, etc.  
American Car Co.  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
Kuhman Car Co., G. U.  
National Ry. Appliances Co.  
St. Louis Car Co.  
Thomas Car Works,  
Perley A.  
Wason Mfg. Co.

**Cars, Second Hand**  
Electric Equipment Co.

**Cars, Self-Propelled**  
General Electric Co.

**Cash Fare Receipts**  
Rand McNally Co.

**Castings, Brass, Composition**  
or Copper  
Ajax Metal Co.  
Anderson Mfg. Co., A. &  
J. M.  
Columbia Machine Wks.  
More Jones Brass & Metal  
Co.

**Castings, Gray Iron and Steel**  
American Bridge Co.  
Amer. Steel Foundries  
Columbia Machine Wks.  
Horne & Ehling  
St. Louis Car Co.  
Standard Steel Works  
Wm. Wharton, Jr. & Co.

**Castings, Malleable and Brass**  
Amer. Brake Shoe & Fdry.  
Co.  
Columbia Machine Wks.  
St. Louis Car Co.

**Catchers and Retrievers,**  
Trailer

Earl, C. I.  
Elec. Service Supplies Co.  
Ohio Brass Co.  
Wood Co., Chas. N.

**Catenary Construction**  
Archbold-Bradley Co.  
Graybar Electric Co., Inc.

**Celling Car**  
Haskelite Mfg. Corp.  
Pantastote Co.

**Chairs, Parlor Car**  
Heywood-Wakefield Co.

**Chasing Plate**  
Manganese Steel Forge Co.

**Change Carriers**  
Cleveland Fare Box Co.  
Electric Service Supplies Co.  
Galef, J. L.

**Circuit Breakers**  
General Electric Co.  
Roller-Smith Co.  
Westinghouse Elec. & M. Co.

**Clamps and Connectors for**  
Wires and Cables  
Anderson Mfg. Co., A. M. &  
J. M.

Dossert & Co.  
Elec. Ry. Equipment Co.  
Elec. Service Supplies Co.  
General Electric Co.  
Hubbard & Co.  
Westinghouse Elec. & M. Co.

**Cleaners and Scrapers, Track**  
(See also Snow-Flows,  
Sweepers and Brooms)

Brill Co., The J. G.  
McGuire-Cummings Mfg. Co.  
Ohio Brass Co.  
Root Spring Scraper Co.  
St. Louis Car Co.

**Clinets and Sockets**  
General Electric Co.

**Coal and Ash Handling**  
(See Conveying and Hoist-  
ing Machinery)

**Colls, Armature and Field**  
Columbia Machine Wks.  
Economy Electric Devices  
Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Coil Banding and Winding**  
Machines

Columbia Machine Wks.  
Electric Service Sup. Co.  
Westinghouse Elec. & M. Co.

**Colls, Choke and Kicklog**  
Electric Service Supplies Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Coin-Counting Machines**  
Cleveland Fare Box Co.  
Galef, J. L.

**International Register Co.**  
The  
Johnson Fare Box Co.

**Coin Sorting Machines**  
Cleveland Fare Box Co.  
Galef, J. L.

**Coin Wrappers**  
Cleveland Fare Box Co.  
Galef, J. L.

**Commutator Slotters**  
Electric Service Supplies Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Commutator Truing Devices**  
General Electric Co.

**Commutators or Parts -**  
Cameron Elec'l Mfg. Co.  
Columbia Machine Wks.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Compressors, Air**  
General Electric Co.  
Graybar Electric Co., Inc.  
Ingersoll-Rand Co.  
Sullivan Machinery Co.  
Westinghouse Tr. Br. Co.

**Compressors, Air Portable**  
Ingersoll-Rand Co.  
Sullivan Machinery Co.

**Compressors, Gas**  
Sullivan Machinery Co.

**Condensers**  
General Electric Co.  
Ingersoll-Rand Co.  
Westinghouse Elec. & M. Co.

**Condenser Papers**  
Irvington Varnish & Ins. Co.

**Conduits, Underground**  
Std. Underground Cable Co.

**Connectors, Solderless**  
Dossert & Co.  
Frankel Connector Co.  
Westinghouse Elec. & M. Co.

**Connectors, Trailer Car**  
Consolidated Car Heating  
Co.  
Elec. Service Supplies Co.  
Ohio Brass Co.

**Control Systems**  
Monitor Controller Co.

**Controllers**  
Amer. Brown Boveri Elec.  
Corp.

**Controller Regulators**  
Electric Service Supplies Co.  
Monitor Controller Co.

**Controllers, Automatic,**  
Electric  
Monitor Controller Co.

**Controllers, Electric**  
Monitor Controller Co.

**Controllers, Motor**  
Monitor Controller Co.

**Controllers or Parts**  
Columbia Machine Wks.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Controllers, Rheostatic**  
Monitor Controller Co.

**Controllers, Speed**  
Monitor Controller Co.

**Controlling Systems**  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Converters, Rotary**  
Amer. Brown Boveri Elec.  
Corp.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Conveying & Hoisting**  
Machinery  
American Bridge Co.

**Copper Wire**  
American Steel & Wire Co.  
Anaconda Copper Mining Co.  
Rome Wire Co.

**Cord, Bell, Trolley, Register,**  
etc.  
Brill Co., The J. G.  
Electric Service Supplies Co.  
International Register Co.

**The**  
Roelinks Sons Co., John A.  
St. Louis Car Co.  
Samson Cordage Works  
Silver Lake Co.

**Cord Connectors and Couplers**  
Electric Service Supplies Co.  
Samson Cordage Works  
Wood Co., Chas. N.

**Couplers, Car**  
American Steel Foundries  
Brill Co., The J. G.  
Ohio Brass Co.  
St. Louis Car Co.  
Westinghouse Tr. Br. Co.

**Crane Controller, Electric**  
Monitor Controller Co.

**Cross Arms (See Brackets)**  
Crossings  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Crossing Foundations**  
International Steel Tie Co.

**Crossing Frogs and Switches**  
Ramapo Ajax Corp.

**Crossings, Manganese**  
Bethlehem Steel Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Crossing Signals, (See Signal**  
Systems, Highway Cross-  
ing)

**Crossings, Track, (See Track,**  
Special Work)

**Compressors, Trolley**  
Ohio Brass Co.  
Westinghouse E. & M. Co.

**Curtains and Curtain Fix-**  
tures  
Brill Co., The J. G.  
Morton Mfg. Co.  
Pantastote Co.  
St. Louis Car Co.

**Dealers' Machinery**  
Electric Equipment Co.  
Gerke, J. W.  
Glyman-Michaels Co.  
Levis & Co., Henry  
Transit Equipment Co.

**Derailing Switches, Tee Rail**  
Ramapo Ajax Corp.

**Destination Signs**  
Columbia Machine Wks.  
Electric Service Supplies Co.

**Detective Service**  
Wish Service, P. Edward

**Door Operating Devices**  
Consolidated Car Heating  
Co.  
National Pneu. Co., Inc.  
Safety Car Devices Co.

**Doors and Door Fixtures**  
Brill Co., The J. G.  
General Electric Co.  
Hale-Kilburn Co.  
St. Louis Car Co.

**Doors, Folding Vestibole**  
National Pneumatic Co.,  
Inc.

**Draft Rigging, (See Coupl-**  
ers)

**Drills, Rock**  
Sullivan Machinery Co.

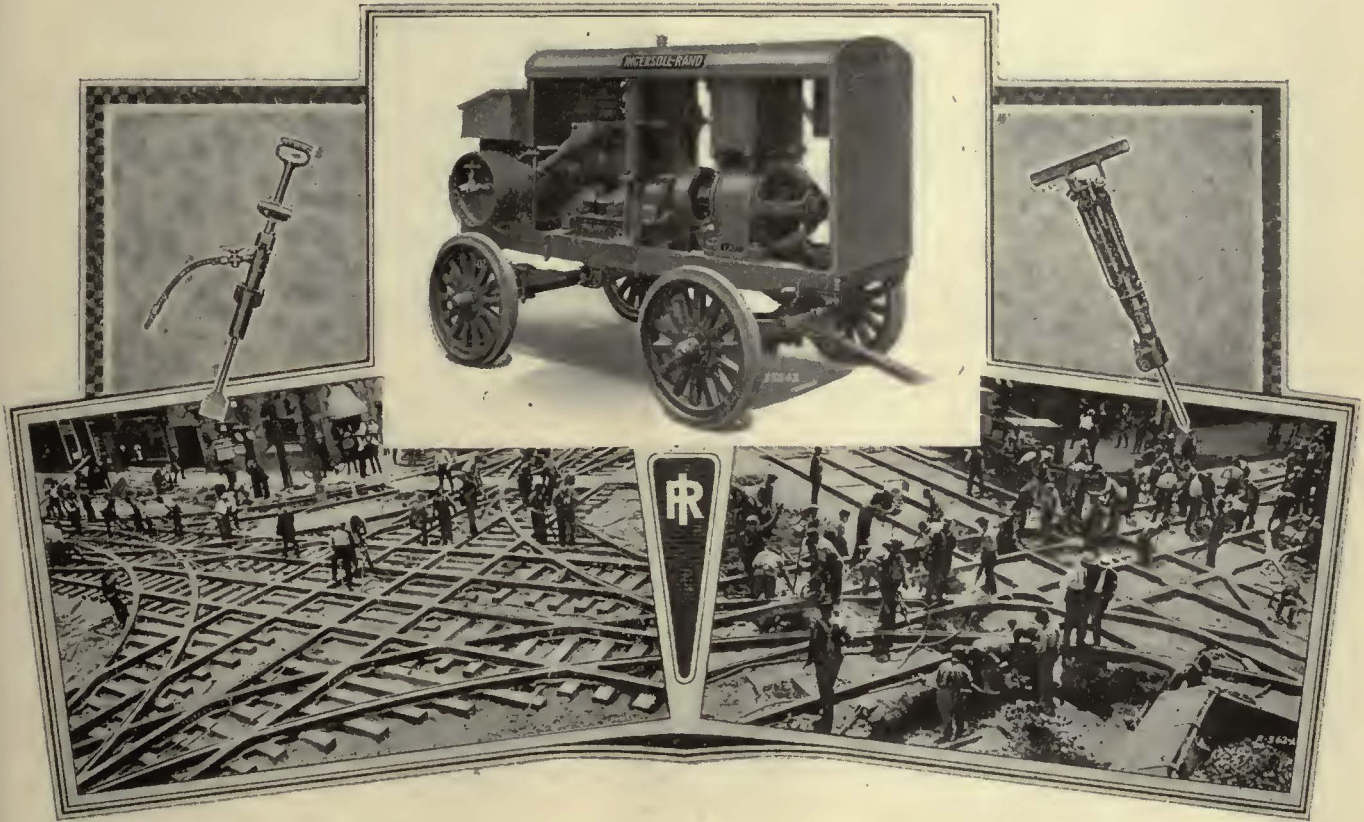
**Drills, Track**  
American Steel & Wire Co.  
Electric Service Supplies Co.  
Ingersoll-Rand Co.  
Ohio Brass Co.

**Dryers, Sand**  
Electric Service Supplies Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.

**Fans**  
Electric Service Supplies Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.



# Pneumatic Tie Tampers and Paving Breakers



## Two very effective means of reducing track work costs

Ingersoll-Rand Pneumatic Tie Tampers tamp track at less than half the cost of doing the job by hand methods. It has been definitely proved on dozens of roads that four men with pneumatic tampers will tamp more track, and do a better job, than 12 to 16 men using hand methods.

I-R Pneumatic "Paving Breakers" save from 60% to 75% of the time and labor taken by hand methods in tearing up pavement or breaking out heavy concrete foundations.

Every road should include Tie Tampers and Paving Breakers in its equipment in order to take advantage of these savings on track work.

*Ask for full details as to the savings made by these tools on other jobs.*

INGERSOLL-RAND COMPANY-11 BROADWAY, NEW YORK CITY.

*Offices in all principal domestic and foreign cities.*

FOR CANADA REFER-CANADIAN INGERSOLL-RAND CO. LIMITED, 260 ST. JAMES STREET, MONTREAL, QUEBEC.

220T.T.

# Ingersoll-Rand



**Electric Grinders**  
Railway Track-work Co.

**Electric Locomotives**  
St. Louis Car Co.

**Electric Transmission Towers**  
American Bridge Co.

**Electrodes, Carbon**  
Railway Track-work Co.  
Una Welding & Bonding Co.

**Electrodes, Steel**  
Indianapolis Switch & Frog Co.  
Railway Track-work Co.  
Una Welding & Bonding Co.

**Electrical Wires and Cables**  
American Elec. Works  
American Steel & Wire Co.  
Graybar Electric Co., Inc.  
Rome Wire Co.

**Engineers, Consulting, Contracting and Operating**  
Allison & Co., J. E.  
Archbold-Brady Co.  
Beeler, John A.  
Bibbins, Rowland J.  
Buchanan & Layne  
Day & Zimmerman, Inc.  
Drum & Co., A. L.  
Ford, Bacon & Davis  
Hemphill & Wells  
Holst, Engelhardt W.  
Jackson, Walter  
Kelker & De Lew  
Kelly Cooke & Co.  
McClellan & Junkersfeld  
Onz, Joe R.  
Railway Audit & Inspection Co.  
Richey, Albert S.  
Dwight P. Robinson & Co.  
Sanderson & Porter  
Stevens & Wood, Inc.  
Stone & Webster

**Engineer, Inspecting and Chemists**  
Pittsburgh Testing Laboratories

**Engines, Gas, Oil and Steam**  
Ingersoll-Rand Co.  
Westinghouse Elec. & M. Co.

**Engines, Gasoline**  
Continental Motors Co.

**Exterior Slide Panels**  
Haskelite Mfg. Corp.

**Fare Boxes**  
Cleveland Fare Box Co.  
Economy Electric Devices Co.  
Galef, J. L.  
Nat'l Ry. Appliance Co.  
Ohmer Fare Register Co.  
Perry Mfg. Co., Inc.

**Fare Registers**  
Electric Service Supplies Co.

**Fences and Fence Posts**  
American Steel & Wire Co.

**Fences, Woven Wire and Fence Posts**  
Acme Wires Co.  
Amer. Steel & Wire Co.

**Fenders and Wheel Guards**  
Brill Co., The J. G.  
Consolidated Car Fender Co.  
Root Spring Scraper Co.  
Star Brass Works  
St. Louis Car Co.

**Fibre and Fibre Tinting**  
Westinghouse Elec. & M. Co.

**Field Coils (See Coils)**

**Finishing Materials**  
Egyptian Lacquer Mfg. Co.  
Valentine & Co.

**Flangeway Guards, Steel**  
W. S. Godwin Co., Inc.

**Flaxing Insulation**  
Nat'l Ry. Appliance Co.

**Floodlights**  
Electric Service Sup. Co.

**Floor, Sph**  
Haskelite Mfg. Corp.

**Flooring, Fireproof**  
Irving Iron Works

**Flooring, Non-Slipping**  
Irving Iron Works

**Flooring, Open, Steel**  
Irving Iron Works

**Flooring, Steel, Subway**  
Irving Iron Works

**Flooring, Ventilating**  
Irving Iron Works

**Floors**  
Haskelite Mfg. Corp.

**Forgings**  
Carnegie Steel Co.  
Standard Steel Works

**Frogs & Crossings, Tee 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.

**Funnell Castings**  
Wm. Wharton, Jr. & Co.

**Furnaces, Electric**  
Amer. Brown Boveri Elec. Corp.

**Furnaces, Electric Steel Melting**  
American Bridge Co.

**Fuses and Fuse Boxes**  
Columbia Machine Wks.  
Consolidated Car Heating Co.  
General Electric Co.  
Graybar Electric Co., Inc.  
Westinghouse Elec. & M. Co.

**Fuses, Refillable**  
General Electric Co.

**Gaskets**  
Westinghouse Tr. Br. Co.

**Gas-Electric Cars**  
General Electric Co.

**Gasoline Trenches**  
Economy Electric Co.

**Gas Producers**  
Westinghouse Elec. & M. Co.

**Gates, Car**  
Brill Co., The J. G.  
St. Louis Car Co.

**Gear Blanks**  
Bethlehem Steel Co.  
Carnegie Steel Co.  
Standard Steel Works

**Gear Cases**  
Chillingworth Mfg. Co.  
Columbia Machine Wks.  
Electric Service Supplies Co.  
Westinghouse Elec. & M. Co.

**Gears and Pinions**  
Bemis Car Truck Co.  
Bethlehem Steel Co.  
Columbia Machine Wks.  
General Electric Co.  
Nat'l Ry. Appliance Co.  
Nuttall Co., R. D.  
Tool Steel Gear & Platen Co.

**Generating Sets, Gas-Electric**  
General Electric Co.

**Generators**  
Amer. Brown Boveri Elec. Corp.  
English Electric Co.  
General Electric Co.  
Graybar Electric Co., Inc.  
Leece Neville Co.  
Westinghouse Elec. & M. Co.

**Gridder Rails**  
Bethlehem Steel Co.  
Lorain Steel Co., The

**Gongs (See Bells and Gongs)**

**Grating, Steel Subway**  
Irving Iron Works

**Greases (See Lubricants)**

**Grinders and Grinding Supplies**  
Metal & Thermit Corp.  
Railway Track-work Co.

**Grinders, Portable**  
Railway Track-work Co.

**Grinders, Portable Electric**  
Railway Track-work Co.

**Grinding Blocks and Wheels**  
Railway Track-work Co.

**Guard Rail Clamps**  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Guard Rails, Tee Rail & Manganese**  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Guards, Trolley**  
Electric Service Sup. Co.  
Ohio Brass Co.

**Hammers, Pneumatic**  
Ingersoll-Rand Co.

**Harps, Trolley**  
Anderson M. Co., A. & J. M.  
Electric Service Sup. Co.  
More Jones Brass & Metal Co.  
Nuttall Co., R. D.

**Headlights**  
Electric Service Sup. Co.  
General Electric Co.  
Ohio Brass Co.  
St. Louis Car Co.

**Headlining**  
Haskelite Mfg. Corp.  
Pantatose Co.

**Heaters, Car (Electric)**  
Consolidated Car Heating Co.  
Economy Electric Devices Co.  
Gold Car Heating & Lighting Co.  
Nat'l Ry. Appliance Co.  
Smith Heater Co., Peter

**Heaters, Car, Hot Air and Water**  
Smith Heater Co., Peter

**Helmets, Welding**  
Railway Track-work Co.

**Holsts, Portable**  
Ingersoll-Rand Co.  
Sullivan Machinery Co.

**Hoists & Lifts**  
Columbia Machine Wks.  
Ford Chain Block Co.

**Hose, Bridge**  
Ohio Brass Co.

**Ignition Units**  
Leece Neville Co.

**Indicating, Signals**  
Nichols-Lintern Co.

**Inspecting Engineers and Chemists**  
Pittsburgh Testing Laboratories

**Instruments, Measuring, Testing and Recording**  
American Steel & Wire Co.  
Economy Electric Devices Co.  
General Electric Co.  
Graybar Electric Co., Inc.  
Roller-Smith Co.  
Westinghouse Elec. & M. Co.  
Weston Electrical Instrument Corp.

**Insulating Cloth, Paper and Tape**  
Anchor Webbing Co.  
General Electric Co.  
Irvington Varnish & Ins. Co.  
Mitchell-Rand Mfr. Co.  
Okonite Co.  
Okonite-Collender Cable Co., Inc.  
Standard Underground Cable Co.  
Westinghouse E. & M. Co.

**Insulating Machinery**  
Amer. Ins. Machinery Co.

**Insulating Silk**  
Irvington Varnish & Ins. Co.

**Insulating Varnishes**  
Irvington Varnish & Ins. Co.

**Insulation (See also Paints)**  
Anderson M. Co., A. & J. M.  
Electric Ry. Equipment Co.  
Electric Service Sup. Co.  
General Electric Co.  
Irvington Varnish & Ins. Co.  
Mica Insulator Co.  
Mitchell-Rand Mfg. Co.  
Okonite Co.  
Okonite-Collender Cable Co., Inc.  
Westinghouse Elec. & M. Co.

**Insulation Cloth Paper & Tape**  
Mica Insulator Co.

**Insulation, Slot**  
Irvington Varnish & Ins. Co.

**Insulator Pins**  
Electric Service Sup. Co.  
Hubbard & Co.

**Insulators (See also Line Material)**  
Anderson M. Co., A. & J. M.  
Electric Ry. Equipment Co.  
Electric Service Sup. Co.  
Graybar Electric Co., Inc.  
Irvington Varnish & Ins. Co.  
Ohio Brass Co.  
Westinghouse Elec. & M. Co.

**Interior Side Linings**  
Haskelite Mfg. Corp.

**Jacks (See also Hoists and Lifts)**  
Buda Co.  
Columbia Machine Wks.  
Electric Service Sup. Co.  
National Ry. Appliance Co.

**Journal Box Liner**  
Manganese Steel Forge Co.

**Journal Box & Pedestal Jaw Gibs or Liners**  
Manganese Steel Forge Co.

**Journal Boxes**  
Brill Co., The J. G.  
St. Louis Car Co.  
S K F Industries

**Junction Boxes**  
Standard Underground Cable Co.

**Lacquer Finishes**  
Egyptian Lacquer Mfg. Co.  
Valentine & Co.

**Lamp Guards and Fixtures**  
Anderson M. Co., A. & J. M.  
Electric Service Sup. Co.  
General Electric Co.  
Westinghouse E. & M. Co.

**Lamps, Arc and Incandescent (See also Headlights)**  
Anderson M. Co., A. & J. M.  
General Electric Co.  
Westinghouse E. & M. Co.

**Lamps, Signal and Marker**  
Electric Service Supplies Co.  
Nichols-Lintern Co.

**Lanterns, Classification**  
Nichols-Lintern Co.

**Letter Boards**  
Haskelite Mfg. Corp.

**Lighting Systems**  
Leece Neville Co.

**Lightning Protection**  
Anderson M. Co., A. & J. M.  
Electric Service Sup. Co.  
General Electric Co.  
Ohio Brass Co.  
Westinghouse Elec. & M. Co.

**Line Material (See also Brackets, Insulators, Wires, Etc.)**  
Anderson M. Co., A. & J. M.  
Archbold-Brady Co.  
Dossert & Co.  
Electric Ry. Equipment Co.  
Electric Service Sup. Co.  
English Electric Co.  
General Electric Co.  
Graybar Electric Co., Inc.  
Hubbard & Co.  
More Jones Brass & Metal Co.  
Westinghouse Elec. & M. Co.

**Locking Spring Boxes**  
Wm. Wharton, Jr. & Co.

**Locomotives, Electric**  
Amer. Brown Boveri Elec. Corp.  
Cummings Car & Coach Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Locomotive, Oil Engine, Electric Driver**  
Ingersoll-Rand Co.

**Lubricating Engineers**  
Standard Oil Co.  
Texas Company  
Universal Lubricating Co.

**Lubricants, Oil and Grease**  
Standard Oil Co.  
Texas Company  
Universal Lubricating Co.

**Lumber (See Pole, Tie, etc.)**

**Manganese Parts**  
Manganese Steel Forge Co.

**Manganese Steel Guard Rails**  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Manganese Steel, Special Track Work**  
Bethlehem Steel Co.  
Wm. Wharton, Jr. & Co.

**Manganese Steel Switches, Frogs and Crossings**  
Bethlehem Steel Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.

**Meters (See Instruments)**  
Roller-Smith Co.

**Mica**  
Mica Insulator Co.

**Motor and Generator Sets**  
General Electric Co.

**Motor Buses (See Buses, Motor)**

**Motor Controllers, Electric**  
Monitor Controller Co.

**Motors, Electric**  
Amer. Brown Boveri Elec. Corp.

**Motor Generators**  
Amer. Brown Boveri Elec. Corp.

**Motor Leads**  
Dossert & Co.

**Motor Starters**  
Monitor Controller Co.

**Motormen's Seats**  
Brill Co., The J. G.  
Electric Service Sup. Co.  
St. Louis Car Co.  
Wood Co., Chas. N.

**Motors, Electric**  
General Electric Co.  
Westinghouse Elec. & M. Co.

**Nuts and Bolts**  
Bethlehem Steel Co.  
Hubbard & Co.

**Ohmmeters**  
Roller-Smith Co.

**Oils (See Lubricants)**

**Oil Purifiers**  
DeLaval Separator Co.

**Oxygen**  
International Oxygen Co.

**Packing**  
Westinghouse Tr. Br. Co.

**Paints and Varnishes (Insulating)**  
Electric Service Supplies Co.  
Mitchell-Rand Mfg. Co.

**Paints and Varnish Preserv.**  
Baldwin Locomotive Wks.

**Paints and Varnishes for Woodwork**  
National Ry. Appliance Co.

**Panels Outside, Inside**  
Haskelite Mfg. Corp.

**Pavement Breakers**  
Ingersoll-Rand Co.  
Sullivan Machinery Co.

**Paving Guards, Steel**  
W. S. Godwin Co., Inc.

**Paving Material**  
Amer. Br. Shoe & Fdry. Co.

**Pedestal Liner**  
Manganese Steel Forge Co.

**Pickups, Trolley Wire**  
Electric Service Sup. Co.  
Ohio Brass Co.

**Pinion Pullers**  
Electric Service Sup. Co.  
General Electric Co.  
Wood Co., Chas. N.

**Pinions (See Gears)**

**Pins & Bushings for Brake Equip.**  
Manganese Steel Forge Co.

**Pins, Case Hardened, Wood and Iron**  
Ohio Brass Co.  
Westinghouse Tr. Br. Co.

**Plas, Wood & Iron**  
Sharp, Edw. P.

**Pipe Fittings**  
Standard Steel Works

**Piston Rings**  
Ever-Tyte Piston Ring Div.

**Planers (See Machine Tools)**

**Plates for Tee Rail Switches**  
Ramapo Ajax Corp.

**Pliers, Rubber Insulated**  
Electric Service Sup. Co.

**Plywood, Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks**  
Haskelite Mfg. Corp.

**Pneumatic Tools**  
Ingersoll-Rand Co.

**Pole Line Hardware**  
Bethlehem Steel Co.  
Electric Service Supplies Co.  
Ohio Brass Co.

**Pole Reinforcing**  
Hubbard & Co.

**Poles and Ties, Treated**  
Bell Lumber Co.  
Cook Pole & Tie Co.  
International Creosoting & Construction Co.

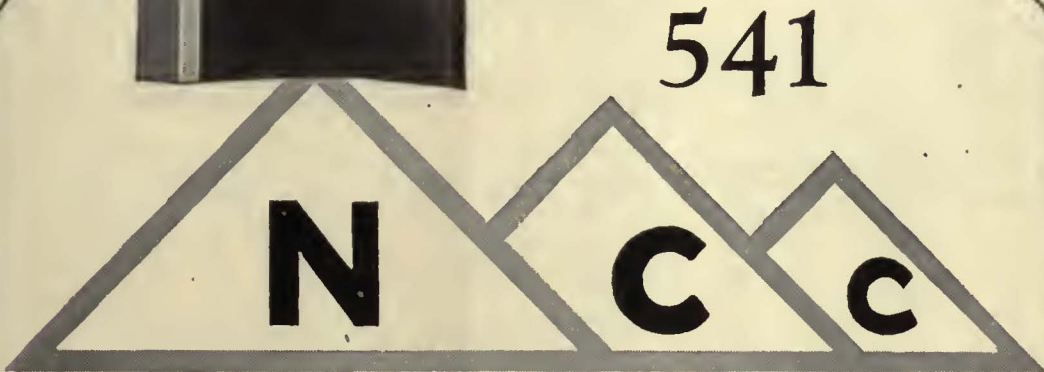
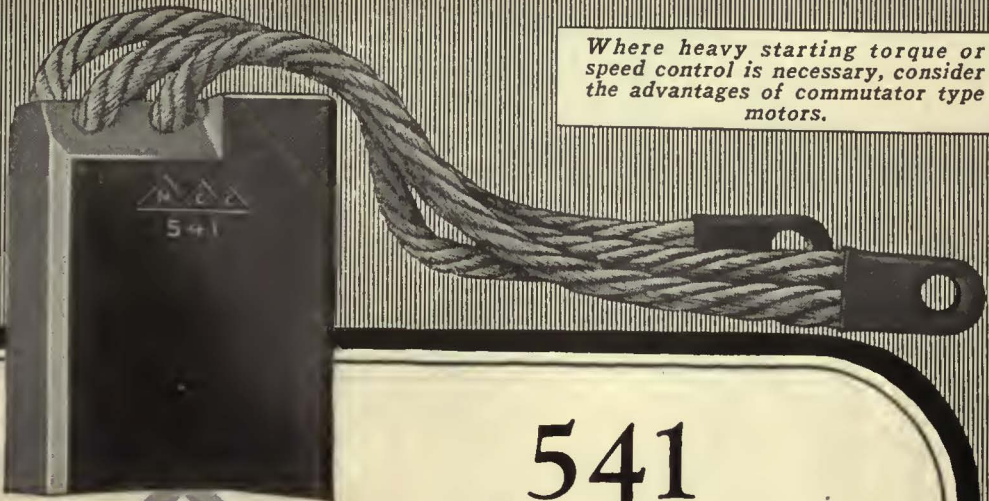
**Poles, Metal Street**  
Bates Expanded Steel Truss Co.  
Electric Ry. Equip. Co.  
Graybar Electric Co., Inc.  
Hubbard & Co.

**Poles, Tie, Posts, Piling and Lumber**  
Bell Lumber Co.  
Cook Pole & Tie Co.  
Int. Creosoting & Construction Co.  
Nangle Pole & Tie Co.

**Poles, Trolley**  
Anderson M. Co., A. & J. M.  
Nuttall Co., R. D.



Where heavy starting torque or speed control is necessary, consider the advantages of commutator type motors.



# LUBRICATED

THE highest attainable brush life and least amount of ring wear on the AC side of rotary converters can be obtained by the use of National Grade 541. This is a specially impregnated brush which will require additional lubrication after a few months of service. Where operators are willing to perform this necessary lubrication, Grade 541 will be found to give exceptionally long life and economical operation.

The long life and highly satisfactory operating characteristics of this grade are secured by special materials and processes developed by our engineers.

*Our Sales Engineers are eager to serve you*

# National Pyramid Brushes

*Manufactured and guaranteed by*

**NATIONAL CARBON COMPANY, INC.**

*Carbon Sales Division*

Cleveland, Ohio

San Francisco, Cal.

Canadian National Carbon Co., Limited, Toronto, Ontario

*Emergency Service Plants*

CHICAGO, ILL.  
551 West Monroe St.  
Phone: State 6092

PITTSBURGH, PA.  
Arrott Power Bldg. No. 3  
Barker Place  
Phone: Atlantic 3570

NEW YORK, N. Y.  
357 West 36th St.  
Phone: Lackawanna 8153



- Poles, Tubular Steel**  
Elec. Ry. Equip. Co.
- Portable Grinders**  
Buda Co.
- Pulleys**  
Okonite Co.  
Okonite-Collender Cable Co., Inc.
- Power Houses**  
American Bridge Co.
- Power Saving Devices**  
Economy Electric Devices Co.  
Nat'l Ry. Appliance Co.
- Pressure Regulators**  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Pumps**  
Ingersoll-Rand Co.
- Pumps, Air Lift**  
Sullivan Machinery Co.
- Pumps, Vacuum**  
Ingersoll-Rand Co.  
Sullivan Machinery Co.
- Punches, Ticket**  
International Register Co.  
The Wood Co., Chas. N.
- Rail Braces and Fastenings**  
Ramapo Ajax Corp.
- Rail Filler**  
Carey Co., Philip
- Rail Grinders (See Grinders)**
- Rail Joints**  
Carnegie Steel Co.  
Illinois Steel Co.  
Metal & Thermit Corp.  
Rail Joint Co.
- Rails, Relaying**  
Hyman-Michaels Co.
- Rails, Steel**  
Carnegie Steel Co.  
Electric Equipment Co.  
Illinois Steel Co.
- Railway Safety Switches**  
Consolidated Car Heating Co.  
Westinghouse Elec. & M. Co.
- Railway Welding (See Welding Processes)**
- Rail Welding**  
Metal & Thermit Corp.  
Una Welding & Bonding Co.
- Rattan**  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
Electric Service Sup. Co.  
Hale-Kilburn Co.  
St. Louis Car Co.
- Rattan, Car Seat Weaving**  
Heywood-Wakefield Co.
- Rectifiers, Mercury**  
Amer. Brown Boveri Elec. Corp.
- Registers and Fittings**  
Brill Co., The J. G.  
Electric Service Sup. Co.  
International Reg. Co., The  
Rooke Automatic Reg. Co.  
St. Louis Car Co.
- Regulators, Motor Speed**  
Monitor Controller Co.
- Regulators, Voltage**  
Leccc-Neville Co.
- Reinforcement, Concrete**  
Amer. Steel & Wire Co.  
Bethlehem Steel Co.  
Carnegie Steel Co.
- Repair Shop Appliances (See also Coil Banding and Winding Machines)**  
Electric Service Sup. Co.
- Repair Work (See also Coils)**  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Replacers, Car**  
Electric Service Sup. Co.
- Resistance, Wire and Tube**  
American Steel & Wire Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Resistances**  
Consolidated Car Heating Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rheostats**  
General Electric Co.  
Monitor Controller Co.  
Westinghouse Elec. & M. Co.
- Roller Bearings**  
Norma Hoffman Bearing Co.  
Timken Roller Bearing Co.
- Roofing, Car**  
Pantaso Co.
- Roofs, Car and Bus**  
Haskelite Mfg. Corp.
- Sanders, Track**  
Brill Co., The J. G.  
Electric Service Sup. Co.  
Nichols-Lintern Co.  
Otau Brass Co.  
St. Louis Car Co.
- Sash Fixtures, Car**  
Brill Co., The J. G.  
St. Louis Car Co.
- Sash, Metal, Car Window**  
Hale-Kilburn Co.
- Scrapers, Track (See Cleaners and Scrapers, Track)**
- Screw Drivers, Rubber Insulated**  
Electric Service Sup. Co.
- Seating Materials**  
Brill Co., The J. G.  
Haskelite Mfg. Corp.  
Fantasote Co.  
St. Louis Car Co.
- Seats, Bus**  
Hale-Kilburn Co.  
St. Louis Car Co.
- Seats, Car (See also Rattan)**  
Brill Co., The J. G.  
Hale-Kilburn Co.  
Heywood-Wakefield Co.  
St. Louis Car Co.
- Second-Hand Equipment**  
Electric Equipment Co.  
Gerke, J. W.  
Hyman-Michaels Co.  
Lewis & Co., Henry  
Transit Equipment Co.
- Shades, Vestibule**  
Brill Co., The J. G.
- Shovels**  
Hubbard & Co.
- Shovels, Power**  
Allis-Chalmers Mfg. Co.  
Brill Co., The J. G.
- Signals, Car Starting**  
Consolidated Car Heating Co.  
Electric Service Sup. Co.  
Nat'l Pneumatic Co., Inc.
- Signals, Highway Crossing**  
U. S. Electric Signal Co.
- Signals, Indicating**  
Nichols-Lintern Co.
- Signal Systems, Block**  
Electric Service Sup. Co.  
Nachod Signal Co., Inc.  
Union Switch & Signal Co.  
U. S. Electric Signal Co.  
Wood Co., Chas. N.
- Signal Systems, Highway Crossing**  
Nachod Signal Co., Inc.
- Slack Adjusters (See Brake Adjusters)**
- Slag**  
Carnegie Steel Co.
- Sleet Wheels and Cutters**  
Anderson M. Co., A. & J. M.  
Columbia Machine Wks.  
Electric Ry. Equip. Co.  
Electric Service Sup. Co.  
More Jones Brass & Metal Co.  
Nuttall Co., R. D.
- Smokestacks, Car**  
Nichols-Lintern Co.
- Snow-Plows, Sweepers and Brooms**  
Brill Co., The J. G.  
Columbia Machine Wks.  
Consolidated Car Heating Co.  
Cummings Car & Coach Co.  
Root Spring Scraper Co.  
St. Louis Car Co.
- Snow Sweeper, Rattan**  
Heywood-Wakefield Co.
- Soldering and Brazing (See Welding Processes and Apparatus)**
- Solderless Connector**  
Frankel Connector Co.
- Special Adhesive Papers**  
Irvington Varnish & Ins. Co.
- Special Trackwork**  
Bethlehem Steel Co.  
Lorain Steel Co. The  
Wm. Wharton, Jr. & Co.
- Splices**  
Amer. Steel & Wire Co.  
Illinois Steel Co.
- Splicing Compounds**  
Westinghouse Elec. & M. Co.
- Splicing Sleeves (See Clamps and Connectors)**
- Springs, Car and Truck**  
American Steel Foundries  
American Steel & Wire Co.  
Brill Co., The J. G.  
St. Louis Car Co.  
Fort Pitt Spring & Mfg. Co.  
Standard Steel Works  
Taylor Electric Truck Co.
- Sprinklers, Track and Road**  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
St. Louis Car Co.
- Stair Steps, Safety**  
Irving Iron Works
- Steel and Steel Products**  
Illinois Steel Co.  
Morton Mfg. Co.
- Steps, Car**  
Irving Iron Works  
Morton Mfg. Co.
- Stokers, Mechanical**  
Babcock & Wilcox Co.  
Westinghouse Elec. & M. Co.
- Storage Batteries (See Batteries, Storage)**
- Strain Insulators**  
Electric Service Supplies Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.
- Strand**  
American Steel & Wire Co.  
Koebling's Sons Co., J. A.
- Superheaters**  
Babcock & Wilcox Co.
- Sweepers, Snow (See Snow Plows, Sweepers and Brooms)**
- Switch Stands**  
Ramapo Ajax Corp.
- Switches and Switchboards**  
Amer. Brown Boveri Elec. Corp.  
Anderson M. Co., A. & J. M.  
Electric Service Sup. Co.  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Switches, Magnetic**  
Monitor Controller Co.
- Switches, Remote Control**  
Monitor Controller Co.
- Switches, Selector**  
Nichols-Lintern Co.
- Switches, Tee Rail**  
Ramapo Ajax Corp.
- Switches, Track (See Track, Special Work)**
- Synchrosopes**  
Roller-Smith Co.
- Tampers, Tie**  
Ingersoll-Rand Co.  
Railway Track-work Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)**
- Tee Rail, Special Track Work**  
Bethlehem Steel Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.
- Telephones and Parts**  
Electric Service Sup. Co.  
Graybar Electric Co., Inc.
- Terminals, Cable**  
Standard-Underground Cable Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)**
- Thermostats**  
Consolidated Car Heating Co.  
Gold Car Heating & Lighting Co.  
Railway Utility Co.  
Smith Heater Co., Pater
- Ticket Choppers and Destroyers**  
Electric Service Sup. Co.
- Tickets & Transfers**  
Globe Ticket Co.
- Tie Plates**  
Illinois Steel Co.
- Ties, Mechanical**  
Dayton Mechanical Tie Co.
- Ties and Tie Rods, Steel**  
American Bridge Co.  
Carnegie Steel Co.  
W. S. Godwin Co., Inc.  
International Steel Tie Co.
- Ties, Wood Cross (See Pole, Ties, Posts, etc.)**
- Tires**  
Plisk Rubber Co.
- Tool Steel**  
Bethlehem Steel Co.  
Carnegie Steel Co.
- Tools, Track and Misc.**  
Amer. Steel & Wire Co.  
Columbia Machine Wks.  
Electric Service Sup. Co.  
Hubbard & Co.  
Railway Track-work Co.
- Tower Wagons & Auto Trucks**  
McCardell & Co., J. R.
- Towers and Transmission Structures**  
Archbold-Brady Co.  
Bates Expanded Steel Truss Co.  
Westinghouse Elec. & M. Co.
- Trackless Trolleys**  
Pierce-Arrow Motor Car Co.  
St. Louis Car Co.
- Track Grinders**  
Metal & Thermit Corp.
- Track, Special Work**  
Bethlehem Steel Co.  
Buda Co.  
Columbia Machine Wks.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.
- Transfer Issuing Machines**  
Ohmer Fare Register Co.
- Transfer Tables**  
American Bridge Co.
- Transformers**  
Amer. Brown Boveri Elec. Corp.  
General Electric Co.  
Graybar Electric Co., Inc.  
Westinghouse Elec. & M. Co.
- Transmission Towers & Structures**  
Amer. Bridge Co.
- Traps, Safety, Stair, Car Step**  
Morton Mfg. Co.
- Trolley Bases**  
Anderson M. Co., A. & J. M.  
General Electric Co.  
More Jones Brass & Metal Co.  
Nat'l Ry. Appliance Co.  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Bases, Retrieving**  
Anderson M. Co., A. & J. M.  
General Electric Co.  
Nat'l Ry. Appliance Co.  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Buses**  
Brill Co., The J. G.  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Trolley Materials**  
Electric Service Sup. Co.  
More Jones Brass & Metal Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.
- Trolley Shoes**  
Miller Trolley Shoe Co.
- Trolleys & Trolley Systems**  
Ford Chain Block Co.
- Trolley Wheel Bushings**  
Mora Jones Brass & Metal Co.
- Trolley Wheels (See Wheels Trolley)**
- Trolley Wheels & Harps**  
Electric Service Supplies Co.  
More Jones Brass & Metal Co.
- Trolley Wire**  
American Steel & Wire Co.  
Amer. Steel & Wire Co.  
Anaconda Copper Mining Co.  
Bridgeport Brass Co.  
Graybar Electric Co., Inc.  
Koebling's Sons Co., J. A.  
Rome Wire Co.
- Truck & Body Bolster Center Plates**  
Manganese Steel Forge Co.
- Trucks, Car**  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
St. Louis Car Co.  
Taylor Electric Truck Co.  
Westinghouse Elec. & M. Co.
- Truss Planks**  
Haskelite Mfg. Corp.
- Tubing, Steel**  
National Tube Co.
- Tubing, Yellow & Black**  
Flexible Varnishes  
Irvington Varnish & Ins. Co.
- Turbines, Steam**  
General Electric Co.  
Westinghouse Elec. & M. Co.
- Turbofans**  
Electric Service Supplies Co.  
Perey Mfg. Co., Inc.
- Turntables**  
American Bridge Co.
- Valves**  
Ohio Brass Co.  
Westinghouse Tr. Br. Co.
- Varnished Papers**  
Irvington Varnish & Ins. Co.
- Varnish Silks**  
Irvington Varnish & Ins. Co.
- Varnishes (See Paints, etc.)**
- Ventilator, Car**  
Brill Co., The J. G.  
National Ry. Appliance Co.  
Nichols-Lintern Co.  
Railway Utility Co.  
St. Louis Car Co.
- Vestibule Linings**  
Haskelite Mfg. Corp.
- Voltmeters**  
Roller-Smith Co.
- Welded Rail Joints**  
Electric Ry. Improvement Co.  
Metal & Thermit Corp.  
Ohio Brass Co.  
Railway Track-work Co.  
Una Welding & Bonding Co.
- Welding and Cutting Tools**  
International Oxygen Co.
- 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.
- Welding Steel**  
Electric Ry. Improvement Co.  
Railway Track-work Co.  
Una Welding & Bonding Co.
- Welding Wire**  
American Steel & Wire Co.  
General Electric Co.  
Railway Track-work Co.  
Koebling's Sons Co., John A.
- Welding Wire and Rods**  
Railway Track-work Co.
- Wheels, Car, Cast Iron**  
Asso. of Mfrs. Chilled Car Wheels  
Griffin Wheel Co.
- Wheels, Car, Steel & Steel Tire**  
American Steel Foundries  
Illinois Steel Co.  
Standard Steel Works
- Wheel Guards (See Fenders and Wheel Guards)**
- Wheel Grinders**  
Wheel Truing Brake Shoe Co.
- Wheel Presses (See Machine Tools)**
- Wheels, Trolley**  
Anderson Mfg. Co., A. & J. M.  
Columbia Machine Wks.  
Electric Ry. Equip. Co.  
Elec. Service Supplies Co.  
General Electric Co.  
Nuttall Co., R. D.  
Star Brass Works
- Wheels, Wrought Steel**  
Carnegie Steel Co.  
Illinois Steel Co.
- Whistles, Air**  
General Electric Co.  
Ohio Brass Co.  
Westinghouse Tr. Br. Co.
- Wire Rope**  
Amer. Steel & Wire Co.  
Koebling's Sons Co., J. A.
- Wire and Cables**  
Acme Wire Co.  
Aluminum Co. of Amer.  
Amer. Electrical Works  
Amer. Steel & Wire Co.  
Anaconda Copper Min. Co.  
Bridgeport Brass Co.  
General Electric Co.  
Graybar Electric Co., Inc.  
Kerite Insulated Wire & Cable Co.  
Okonite Co.  
Okonite-Collender Cable Co., Inc.  
Koebling's Sons Co., J. A.  
Rome Wire Co.  
Standard Underground Cable Co.  
Westinghouse E. & M. Co.



# HUBBARD

## HARDWARE *All along the line—*

You can concentrate your buying of line hardware in one catalog—the Hubbard Catalog. And you can always be sure of getting prompt service—Hubbard Service.

These two factors are made possible because Hubbard Plants are the largest of their kind in the world. And because Hubbard Distribution includes 124 jobbers throughout the United States who carry complete stocks of Hubbard Standard Pole Line Hardware and Peirce Construction Specialties.

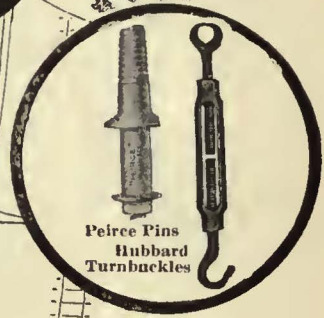
Our Engineering and Testing Department is prepared to assist you at all times with your special problems.

*Send to your nearest dealer or to us for full information—including a copy of our Catalog 24.*

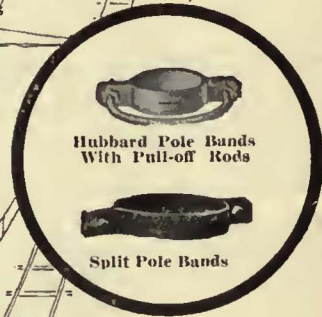
**HUBBARD & COMPANY**  
OAKLAND, CALIF.

Pittsburgh

Chicago

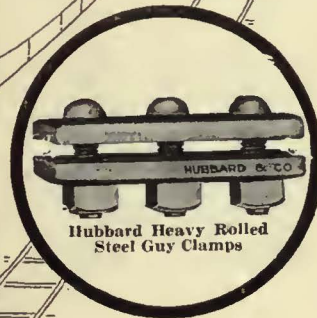


Peirce Pins  
Hubbard  
Turnbuckles

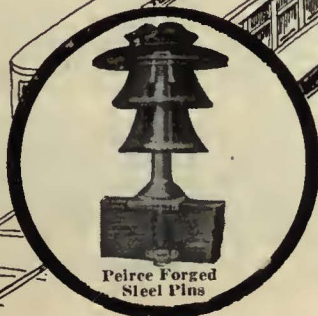


Hubbard Pole Bands  
With Pull-off Rods

Split Pole Bands



Hubbard Heavy Rolled  
Steel Guy Clamps



Peirce Forged  
Steel Pins

*The*

Hardware Makes the Line  
Hubbard Makes the Hardware

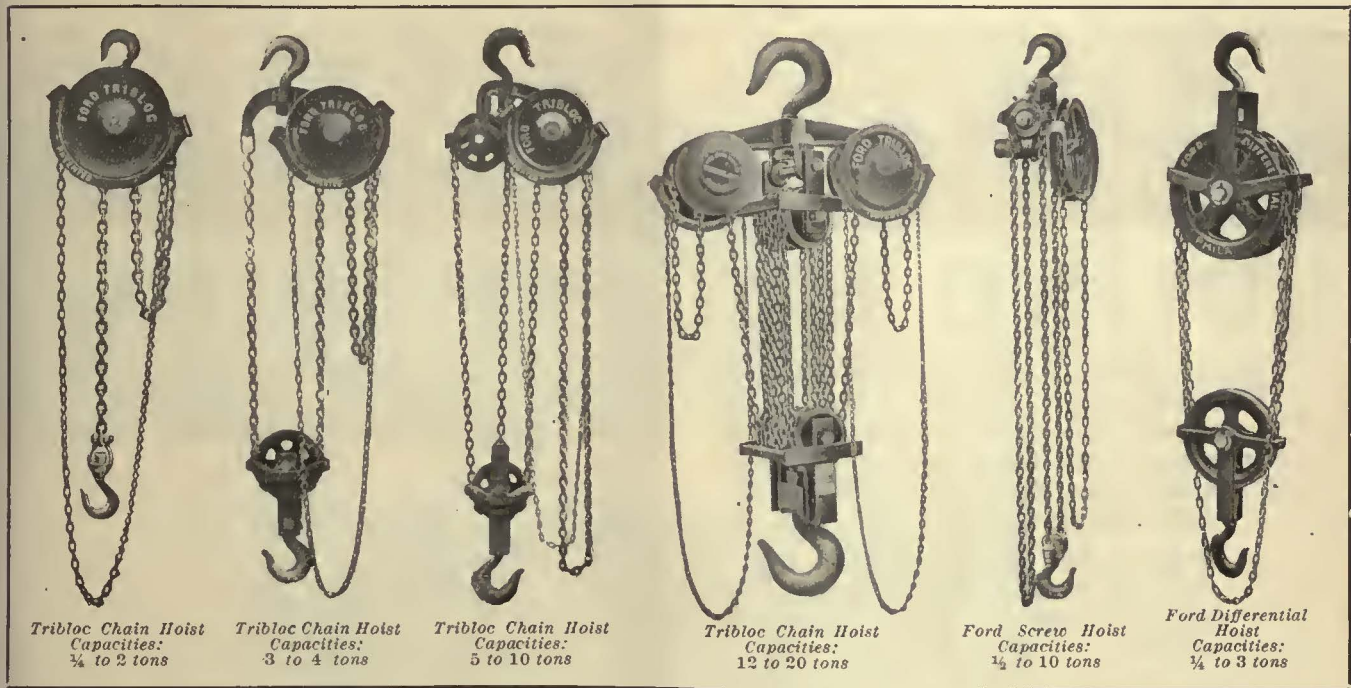








# TRIBLOC CHAIN HOISTS



Ford Tribloc Chain Hoists are built in many types to supply the many hoisting requirements of industrial plants and other users. A few of the more widely used types are shown here. Information on our complete line promptly furnished on application. Send for Catalog 7-B.



One-ton Motorbloc running on Coburn Overhead Track, handling chilled iron rolls weighing 1500 pounds.

## MOTORBLOC

### The Motor-Driven Chain Hoist

Developed to bridge the gap between the recognized fields of Hand Chain Hoists and High Speed Electric Traveling Hoists. Where load lifting is too frequent for the practical use of Chain Hoists but not often enough to justify expensive hoisting equipment, MOTORBLOC supplies the need at minimum cost.

This hoist is controlled by a simple self-contained pendant switch, easily operated by the fingers of one hand, leaving the other hand free to guide the load.

The compactness of this hoist is indicated by the fact that the one-ton hoist weighs only 140 pounds and is readily portable. Simply plug in any electric light socket—hook the hoist to a support—and it is instantly ready for work.

Let us send you complete information.

FORD CHAIN BLOCK COMPANY  
2nd and Diamond Sts., Philadelphia, Penna.



# Dependable Power for Every Purpose



## SOUND ENGINEERING

To know definitely the requirements of power for bus operation, Continental Engineers have gone to the very bottom of bus transportation and have designed to meet the requirements of sound operating practice.

Therefore Continental Bus Engines give the operator all of the practical results that go to make the bus line a successful business.

Continental Bus Motors deliver the cor-

rect power output to balance bus capacity, plus reliability, long life, easy maintenance and economical operation.

All principles of Continental Bus Engine design are directed toward profitable operating results, which is the ultimate aim of the operator and his prime reason for being in business.

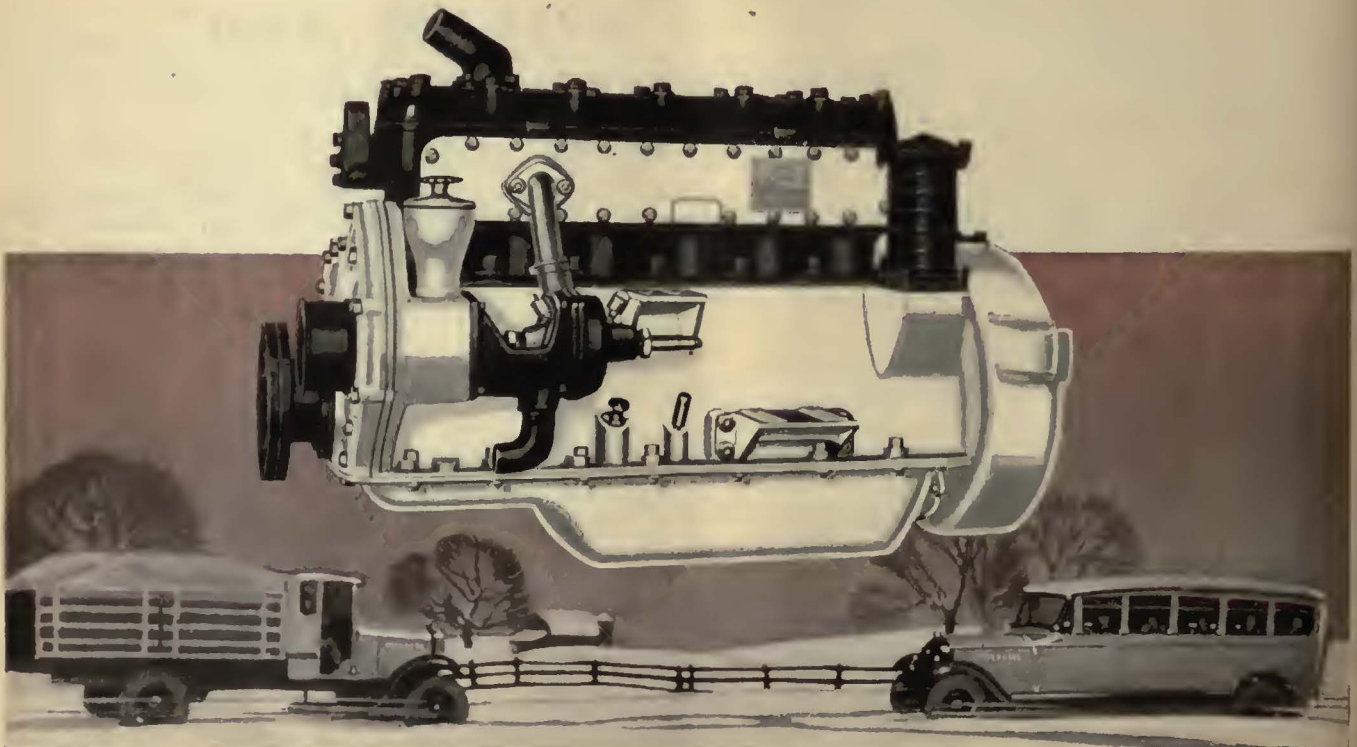
Behind every Continental Engine is a quarter century of experience by the largest manufacturer of gasoline engines.

### CONTINENTAL MOTORS CORPORATION

Offices: Detroit, Michigan, U.S.A.

Factories: Detroit and Muskegon

*The Largest Exclusive Motor Manufacturer in the World*

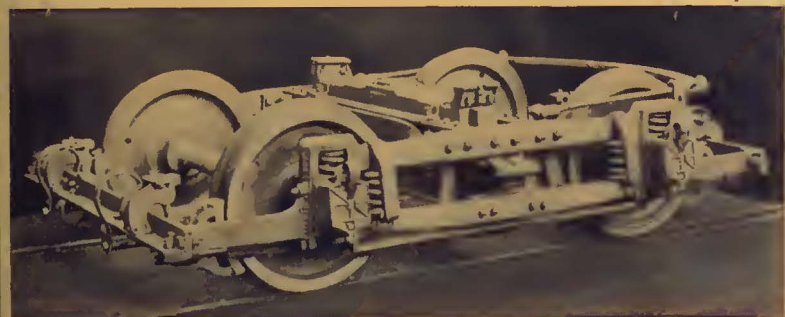


# *Continental Motors*



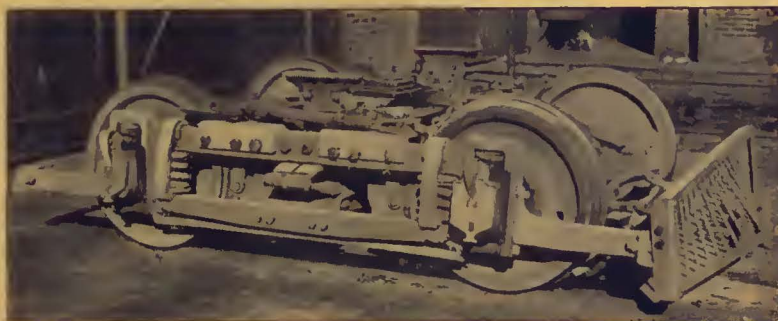
# Lehigh Traction Keeps Step With Truck Improvements

1.



After nineteen years you wouldn't think it the same truck

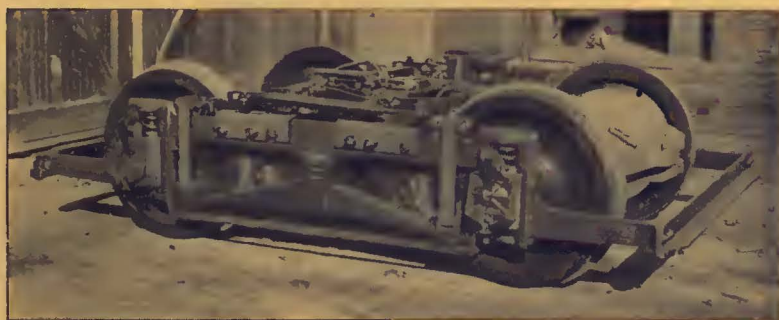
2.



### The first step—

was taken two years ago after this Brill 27-E type truck had been in service 17 years. The brake rigging was changed to the inside-hung type with Brill Half-ball Brake Hangers, affecting a saving of 250 lb. per truck in weight.

3.



### And now—

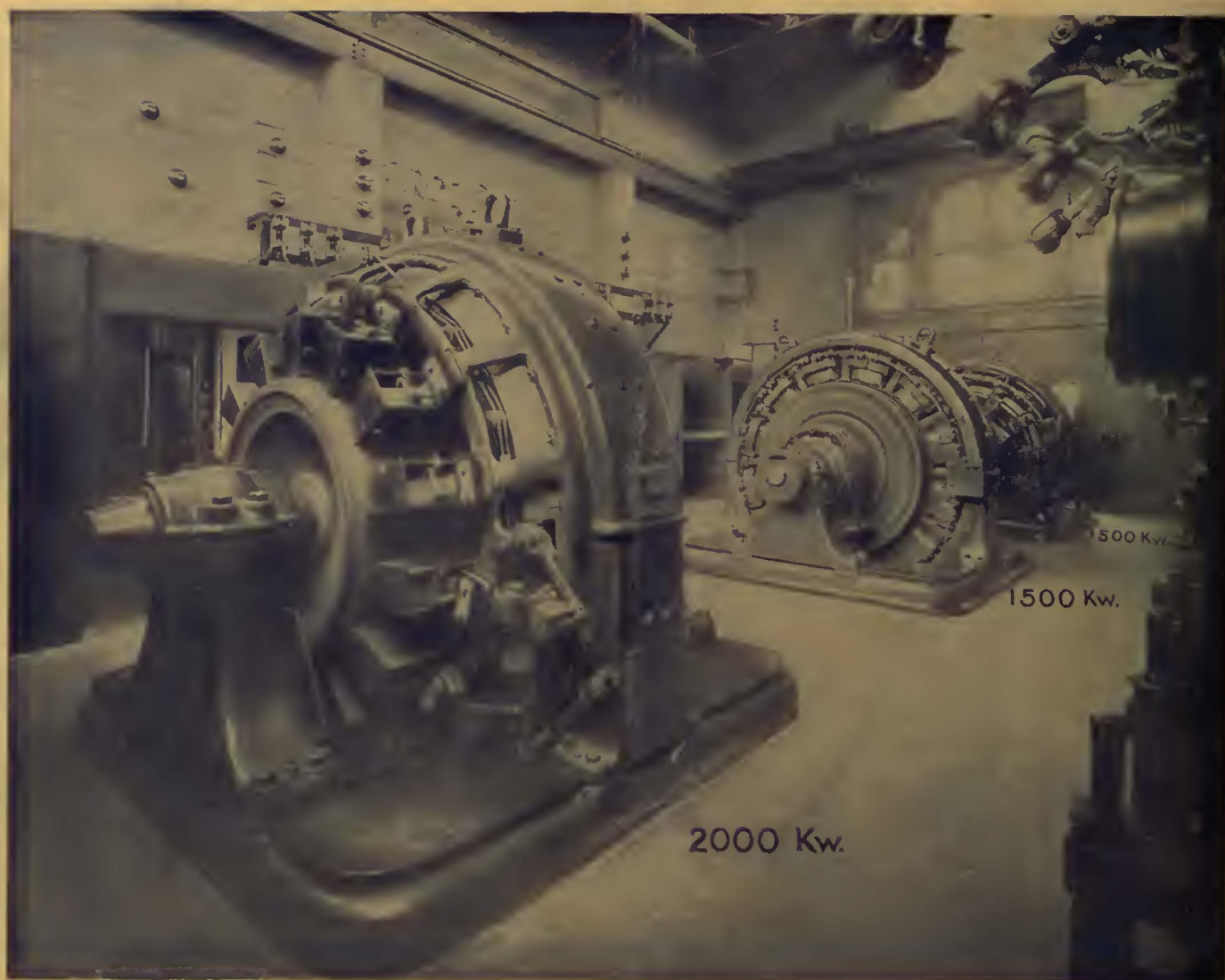
other improvements have just been completed, involving steel type bolster, Brill Bolster Guides, Semi-elliptic Springs and Brill Twin Links with the Brill Graduated Spring System in place of the full-elliptic type springs, resulting in an additional saving of 450 lb. per truck.

### Reduces Truck Weight

700 lb. or 1400 lb. per car, besides modernizing truck equipment and improving service.

 **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.





## Reliable power back of San Francisco trolleys



The largest converter capacity under one roof on the Pacific Coast is in this substation of the Market Street Railway, at 8th Avenue and Geary Streets, San Francisco. The 2000-kw. unit, incorporating the new features of G-E design, was added to the installation in 1923 after the two 1500-kw. units had been in continuous operation for nine years.

G-E Railway Synchronous Converters are being preferred by railway engineers particularly because of two important features:

**RADIAL TYPE BRUSH RIGGING** gives maximum space between brush-holders and eliminates all overhanging parts. Where arcs might form, the exposed parts are protected by arc-resistant material.

**HIGH-RELUCTANCE COMMUTATING POLES** maintain the proper flux to insure commutation under severe load conditions. They enable the converter to withstand many disturbances and prevent service interruption.

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, S.D.Y.

N. Y. SALES OFFICES IN ALL