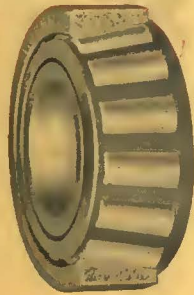


ELECTRIC RAILWAY JOURNAL

Publishing Company, Inc.

October 29, 1927

Twenty Cents per Copy



HOUSTON PUBLIC LIBRARY
HOUSTON, TEXAS.

All of Them *Every One!*

Ten electric cars in the 1927 A. E. R. A. exhibit were on anti-friction bearings. All ten of them were on Timken Tapered Roller Bearings—*every one* Timken-equipped.

And every single maker exhibiting buses, trucks, and taxicabs used Timken Tapered Roller Bearings—often at *every* point of hard service—transmission, differential, pinion or worm, rear wheels, front wheels, steering pivots, fan and engine auxiliary shafts.

In Transportation, as in all Industry, Timken sweeps on!

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

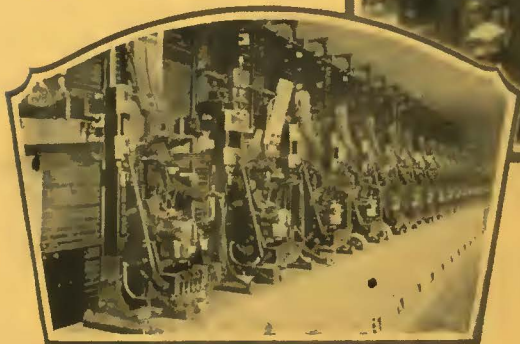
TIMKEN
Tapered
ROLLER BEARINGS



Automatic Railway Switchboard, Installed by the Indianapolis Street Railway Company →



Indianapolis Street Railway's Installation of Type CH Interrupters. ↓



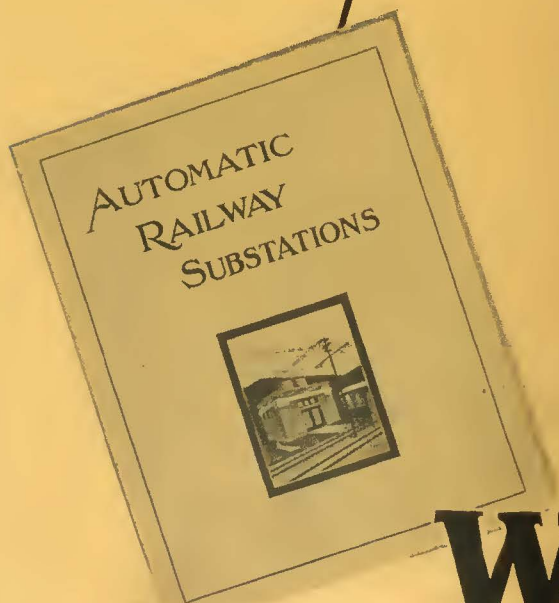
AUTOMATIZE!

“NEW installations of railway substations are, in most instances, connected with the extension or modification of existing transportation systems. In such cases, it is usually the purpose to effect several results such as, increase of system capacity, replacement of obsolete, inefficient or worn-out equipment, reduction of excessive investment in feeder copper or improvement of voltage conditions. Where a complete new system is to be installed, the problem is somewhat changed and simplified in certain details, but the fundamental considerations are, in general the same. It must be constantly borne in mind that the ultimate purpose is to convert a-c. energy into transportation service, which, in turn, must measure up to certain predetermined standards”. (Excerpt from Publication C-1793, Automatic Railway Substations).

the book shows how and why

This circular has as its purpose a complete outline of the major economic and engineering considerations, mentioned above, and to point out those features which are essential to successful operation.

Our nearest district office has your copy of Publication C-1793. Ask for it at your earliest convenience.



SOME SUBJECTS COVERED

- Systems Studies.
- D-C. Machine and Selection of Conversion Equipment.
- Feeder Protection.
- Substation Buildings.
- Selection of Switching Equipment.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania

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



Westinghouse

ELECTRIC RAILWAY JOURNAL

CHARLES GORDON, Editor

HENRY W. BLAKE
Senior Editor
GEORGE J. MacMURRAY
News Editor
G. W. JAMES, JR.
Assistant Editor
PAUL WOOTON
Washington Correspondent
ALEX McCALLUM
Editorial Representative
London, England

ARRIS BUCK
Managing Editor
JIN A. DEWHURST
Associate Editor
JIN A. MILLER, JR.
Associate Editor
CARENCE W. SQUIER
Associate Editor
GIL W. STOCKS
Associate Editor

CONTENTS

Pages
811-848

OCTOBER 29, 1927

Editorials	811
Transit Reports Presented in New York	814
Recommendations of Samuel Untermyer, special counsel to the New York Transit Commission, and C. E. Smith, consulting engineer to the City Comptroller, differ widely. The former desires recapture of existing lines for operation at 5 cents, while the latter proposes unification at a fare to cover the cost of service.	
Free Rides Given in El Paso	818
Improved Service Builds Business in Chicago	819
Chicago Surface Lines continues to increase revenue and reduce expenses with better cars on smooth track, closer schedule supervision and higher standard of maintenance. Increased revenue and reduced cost are shown in company's Coffin Award brief.	
Detroit Street Traffic Survey	823
Report reveals that city is less than 50 per cent efficient in the use of its streets. Only 19.1 per cent travel by private auto.	
Wishing Frames at Edinburgh and London	824
Spring with One-Man Cars in Scranton	825
By C. G. KEEN.	
With completion of fifteen cars now being converted the Scranton Railway will be 100 per cent one-man equipped, with a marked reduction in operating cost.	
Flight Accounting for 25 Depots Centralized.....	825
Police's State of Mind Controls Car Advertising.....	826
By J. C. BARNES.	
Lehigh Valley Has a Trolley "Greeter".....	828
Employee of the Lehigh Valley Transit Company directs incoming railroad passengers to the proper cars for various destinations.	
Maintenance Methods and Devices.....	829
Association Activities	832
Problems of Commissioners Treated in Committee Reports	832
American Association News	833
News of the Industry	834
Foreign News Notes	838
Recent Bus Developments	839
Financial and Corporate.....	841
Personal Mention	844
Manufactures and the Markets	846

Autumn

MIGHTY trees are discarding their gorgeous raiment of gold, bronze and red leaves these autumn days. For them it marks another epoch in their growth of progress. Each year their spreading branches reflect the dynamic force that is causing them to forge ahead. The old leaves have served their purpose and are consigned to oblivion.

So with the industry as with nature, there must be a potential power working to bring forth new and better equipment. When the old has served its purpose it should follow the leaves. Each year, despite the buffeting of storm and wind the mighty oak, symbol of strength and hardiness, typifies the determination and courage of the industry to reach greater heights.

Like the forester the JOURNAL steadfastly and carefully watches for any signs of decaying obsolescence, points with pride to twigs of progress that hold the buds of new developments and garners the acorns of statistics to show what a vital factor the street car is in the life of the nation.

McGRAW-HILL PUBLISHING COMPANY, INC.

Tenth Avenue at 36th Street, New York, N. Y.
New York District Office, 285 Madison Ave.

JAMES H. MCGRAW, President
JAMES H. MCGRAW, JR., V.-P. and Treas.
MALCOLM MUIR, Vice-President
EDWARD J. MERRIN, Vice-President
MARION BUTTON, Vice-President
EDGAR KOVAK, Vice-President
C. H. THOMPSON, Secretary

WASHINGTON: National Press Building

CHICAGO: 7 S. Dearborn Street

PHILADELPHIA: 1000 Arch St.

CLEVELAND: Guardian Building

ST. LOUIS: Bell Telephone Building

SAN FRANCISCO: 883 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 to 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, 30 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, 1927, by McGraw-Hill Publishing Company, Inc.

Published weekly. Entered as second-class matter, June 23, 1890, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Cable Address: "Mechinist, N. Y."
Publishers of
Engineering News-Record
American Machinist
Power
Chemical and Metallurgical Engineering
Coal Age
Coal Age News
Engineering and Mining Journal
Ingeniero Internacional
Bus Transportation
Electric Railway Journal
Electrical World
Industrial Engineering
Electrical Merchandising
Radio Retaining
Construction Methods
Electrical West
(Published in San Francisco)
American Machinist—European Edition
(Published in London)



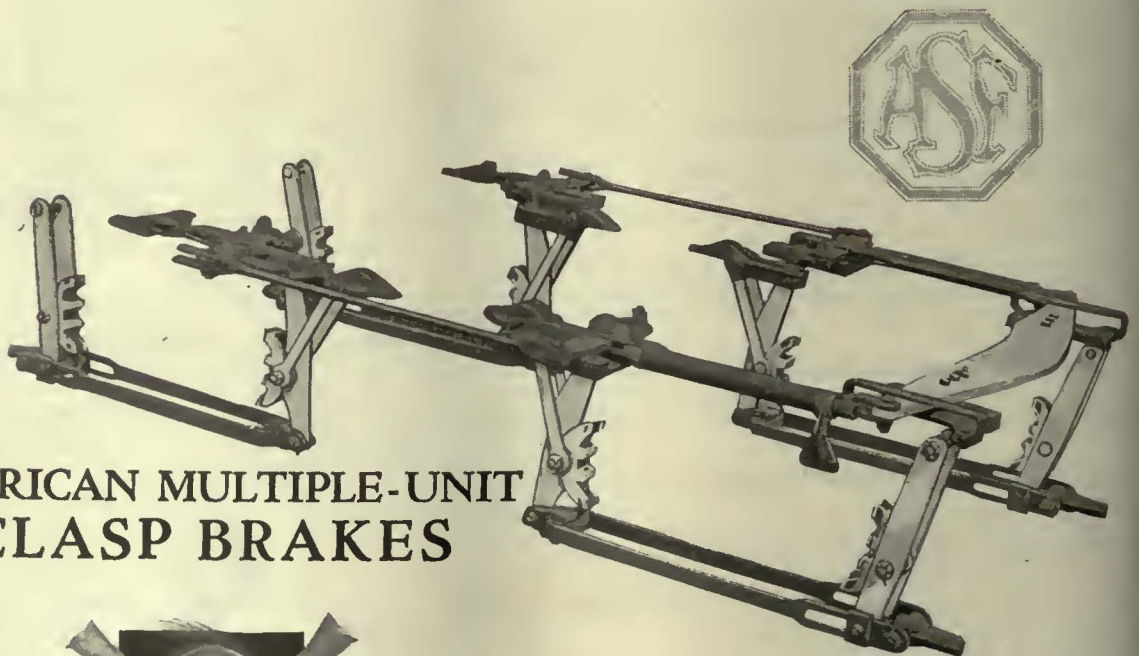
AS LOGICAL AS THE BALANCING OF SCALES



To obtain the unknown weight of an object, by balancing it with known weights was one of the earliest scientific developments. This principle of equalization of forces has had countless practical applications. It is logical.

In the modern railway clasp brake, equal pressure is applied to opposite sides of each wheel, through standard brake shoes, whereas the ordinary practice is to apply the force to one side only. The clasp brake, or balanced braking system, neutralizes the tendency to one-sided wear on journal bearings, pedestals and other truck parts. It affords smoother braking with less heating of brake shoes, and reduces the number of "slid-flat" wheels.

In short—it is the modern and scientific braking system—which is finding increasing favor for heavy traction, and rapid transit service.



AMERICAN MULTIPLE-UNIT
CLASP BRAKES

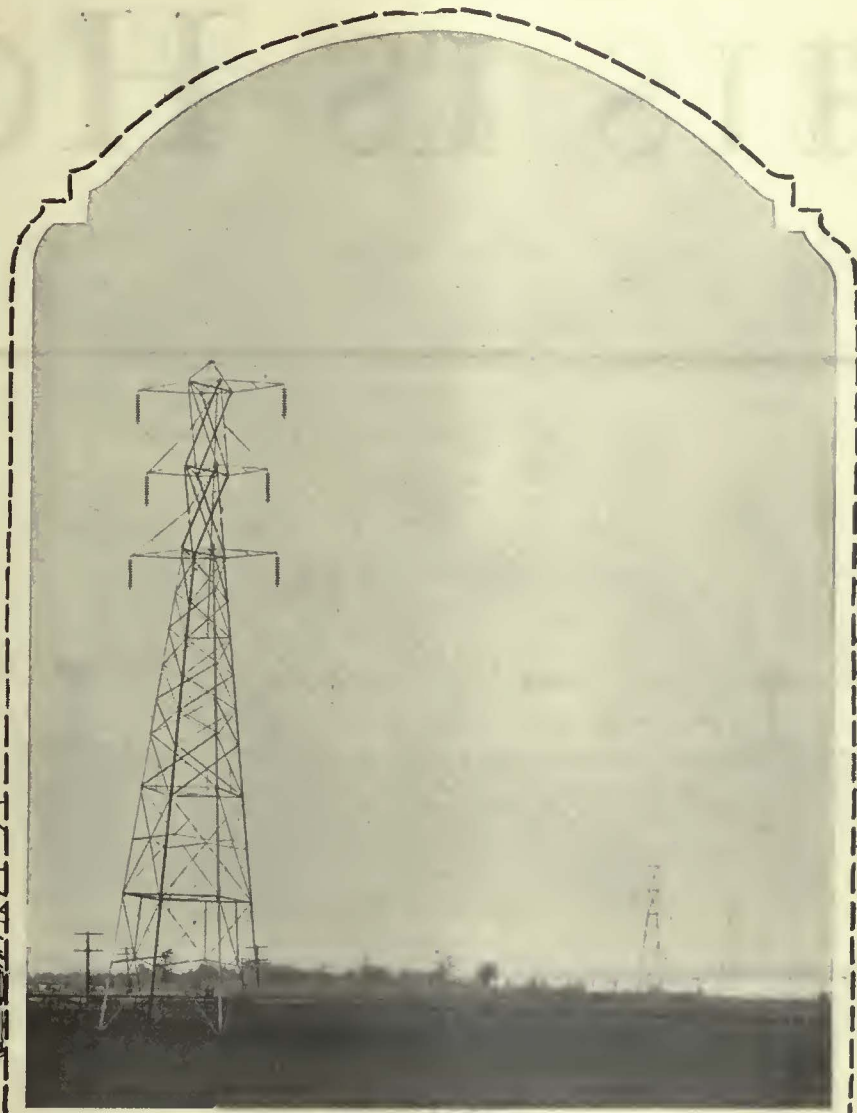


AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



High tension transmission line of The Milwaukee Electric Railway and Light Co. O-B insulators are used.

Select only Proved Insulators. They will Pay Real Profits in the end

It is wasteful to save a little in insulator first cost and lose many dollars later in labor and materials for premature replacement.

It is economy to take the necessary time to make sure you are selecting those insulators whose long life has been well proved. It is not the first cost but the cost per year during their life which gives the final measure of economy.

You would expect the large electric power companies to have

established insulator values pretty definitely after having bought, installed and recorded performance records of many millions of them.

Indicative of the collective opinion of these power companies is the fact that over 50% of major transmission lines are O-B insulated. The significant thing for you in this is the fact that economy of using O-B insulators is

demonstrated by the preponderance of their use, and by the further fact that all O-B insulators of all sizes from small pin types to massive bushings are manufactured with identical materials and inspected and tested under exactly the same procedure.

Care in making sure you buy insulators whose records in service have proved them to be longest-lived, pays dollars in profit later because replacements are long postponed.

Ohio Brass Company, Mansfield, Ohio
 Dominion Insulator & Mfg. Co., Limited
 Niagara Falls, Canada
 468H

Ohio Brass Co.

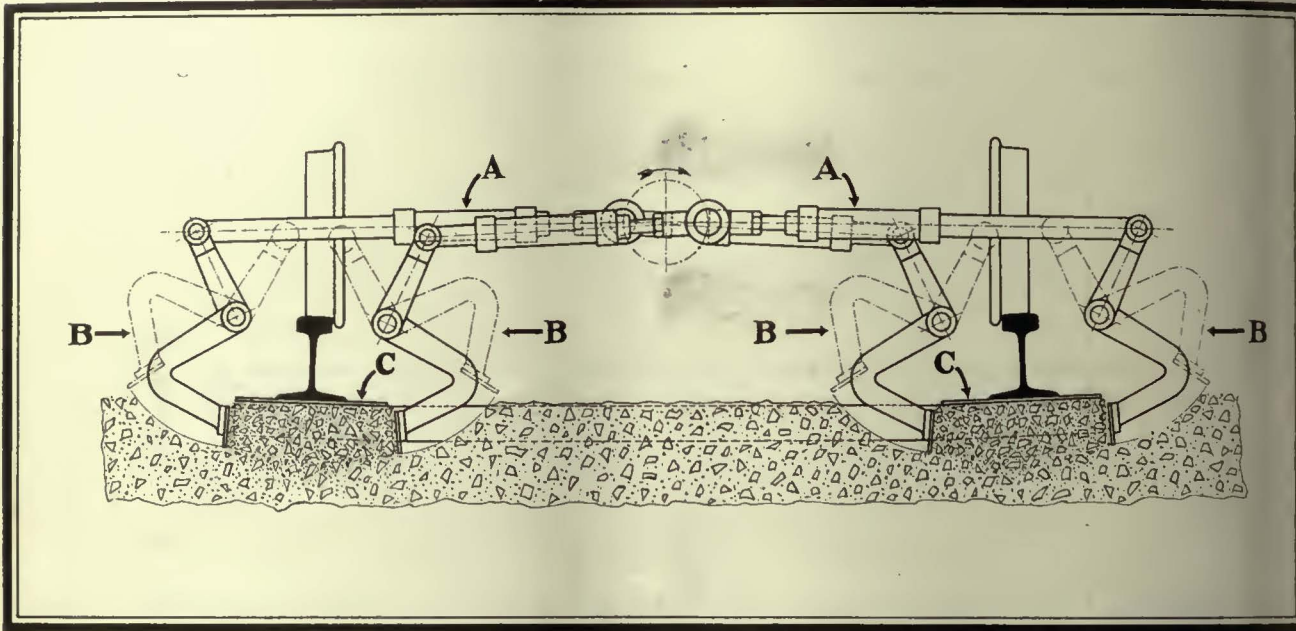


SALES OFFICES: NEW YORK CHICAGO

PHILADELPHIA PITTSBURGH CLEVELAND
 SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
 LINE MATERIALS
 RAIL BONDS
 CAR EQUIPMENT
 MINING MATERIALS
 VALVES

THIS IS HOW



Cross section view of tamper showing operation

The COMPRESSION TAMPER

—will be made by the International Steel Tie Co.,
Cleveland, Ohio, in the interests of better, more lasting
track construction.

STEEL TWIN

T WORKS —

A 1½ H.P.-550 D.C. all weather motor operating through a worm gear, drives the crank shaft which actuates four connecting rods (A), with spring cylinders for give and take, which drive the tamping arms (B), the latter acting simultaneously on opposite sides of the tie plate (C) on both rails. The tamping arms have a speed of 20 strokes per minute, giving the machine a theoretical production of 6000 feet of track per day.

The concrete is forced under the plate at a pressure of 400 lbs. As the tamping arms (B) start on their downward stroke the concrete, which flows between, is forced under the tie plate (C) from opposite sides. As the tamping arms continue their stroke, the concrete is forced against the subgrade and the bottom of the tie plate. In demonstrations, it has been possible to make this force so great as to actually lift the entire tie and rail structure giving absolute evidence that the concrete was bearing 100% against the tie plate, and was going into compression—forcing out all air and water pockets, and giving a more dense mixture.

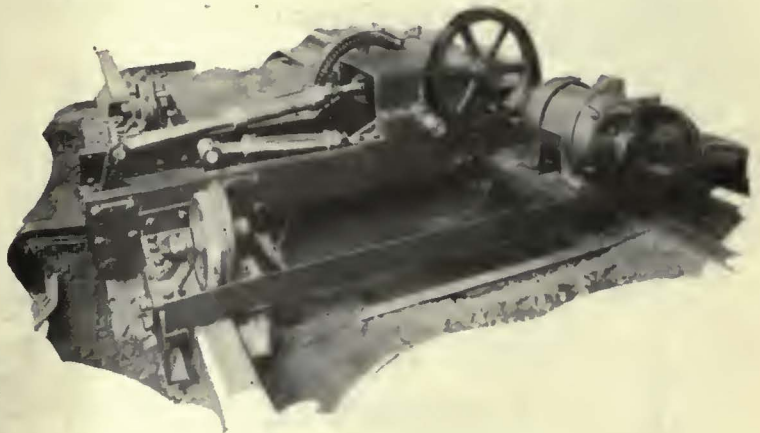
The operator, who rides the machine, controls the track speed by moving the machine by hand. A slight turn of one of the track wheels easily moves the machine. A punch press type of clutch starts the tamper, and can be locked for continuous operation.

The compression tamper removes the human element from track construction guaranteeing absolute 100% concrete bearing against the tie and rail, with total absence of voids and water pockets.

These compression tampers will be available for your 1928 track program. Arrangements should be made now for special track gauges.

The International
Steel Tie Company

Cleveland, Ohio



Photograph of the Compression Tamper in actual operation

TIE TRACK



HIGH SPEED and SAFETY

WHEN YOUR interurban cars are clipping off the miles at a high speed you want to know that you have safeguarded your patrons and your reputation. "Standard" rolled steel wheels are built to stand up with the maximum of safety under all conditions.



also
Axles
Armature Shafts
and
Springs



**STANDARD STEEL
WORKS COMPANY**
PHILADELPHIA, PA.

CHICAGO
ST. LOUIS
NEW YORK

BRANCH OFFICES
HOUSTON
PORTLAND
RICHMOND
MEXICO CITY

SAN FRANCISCO
ST. PAUL
PITTSBURGH

WORKS: BURNHAM, PA.

Golden Glow

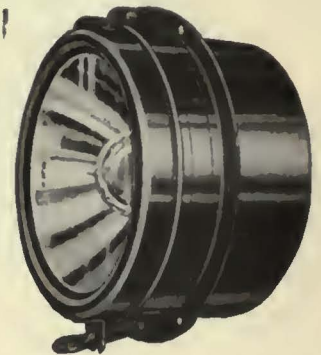


Protection!

Police regulation of traffic has eliminated much confusion and greatly increased safety for both pedestrians and vehicles. Yet police regulation is the most limited at night when danger is greatest.

Protect your service against accidents during these hours by means of proper headlights—Golden Glow Headlights that project the well-known, non-glaring but penetrating Golden Glow light.

Our latest pamphlets describe the various styles and sizes. Write today for your copies.



Type DG Golden Glow Headlight for city service. Being fitted with a Golden Glow prismatic reflector it illuminates a wide area adjacent to and for about 50 feet ahead of the car.

Home office and plant at 17th & Cambria Sts., PHILADELPHIA; District offices at 230 So. Clark St., CHICAGO; 50 Church St., NEW YORK; Bessemer Bldg., Pittsburgh; 88 Broad St., Boston; General Motors Bldg., Detroit; 316 N. Washington Ave., Scranton; Canadian Agents, Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver.

Type R Golden Glow Railway Headlights are made in various types and fitted with either 9-inch or 13-inch diameter Golden Glow reflectors for suburban and interurban service.

ELECTRIC SERVICE SUPPLIES Co.

MANUFACTURER OF RAILWAY, POWER AND INDUSTRIAL ELECTRICAL MATERIAL





A. C. F. Coach of modern design, gives a maximum seating capacity, ample space for covered baggage compartment, and positive safety through Air Brake control. The Westinghouse Automotive Air Brake is standard equipment on all A. C. F. models.

There is something more than Safety in the Westinghouse Automotive Air Brake

Combatting the ever present evil of "brake riding," the Westinghouse Automotive Air Brake has come to be recognized not alone for its positive, safe, quick action—but as a potent economic necessity.

We feel safe in saying that more than half the expense of brake lining is wasted through nervous anticipation on the part of the driver, which is known as "brake riding"—the direct unconscious result of lack of confidence in ordinary brakes.

With the Westinghouse Automotive Air Brake, responsive to the slightest touch, unnecessary braking is minimized if not entirely eliminated, drivers are in turn relieved from undue mental and physical strain . . . and, as a consequence, an entire service is bettered.

Cut your braking expense . . . insure safety . . . get fuller information on the many advantages of the Westinghouse Automotive Air Brake from any of our conveniently located offices. This service is maintained for the exclusive use of the coach operator and is in no way obligatory.



The Westinghouse Air Brake is standard equipment on many of the most prominent coaches on many others it is optional equipment, approved and recommended by the manufacturer who is equipped to install the system upon specification.

6200

WESTINGHOUSE TRACTION BRAKE COMPANY
Automotive Brake Division: WILMERDING, PENNA.

WESTINGHOUSE AUTOMOTIVE AIR BRAKES

A STUDEBAKER BUS *officially opens the Snow Locked* McKenzie Pass



Successfully bucking its way through deep drifts, a 21-passenger Studebaker Bus officially opened the famous McKenzie Pass Highway in June. This road, which crosses the Cascades at an elevation of 5200 feet, is snowbound six months of the year—drifts 20 feet deep form in the lava field offering an almost impassable barrier. Highway crews with a rotary plow spent weeks breaking the trail most of the way. The engineers of the Oregon Highway Commission in a Studebaker Bus, piloted by M. A. Reed, Superintendent of the Oregon Stages, Inc., inspected the opened highway and rode in comfort while the powerful bus tore through the remaining miles of deep snow.

STUDEBAKER **75** HEAVY DUTY CHASSIS

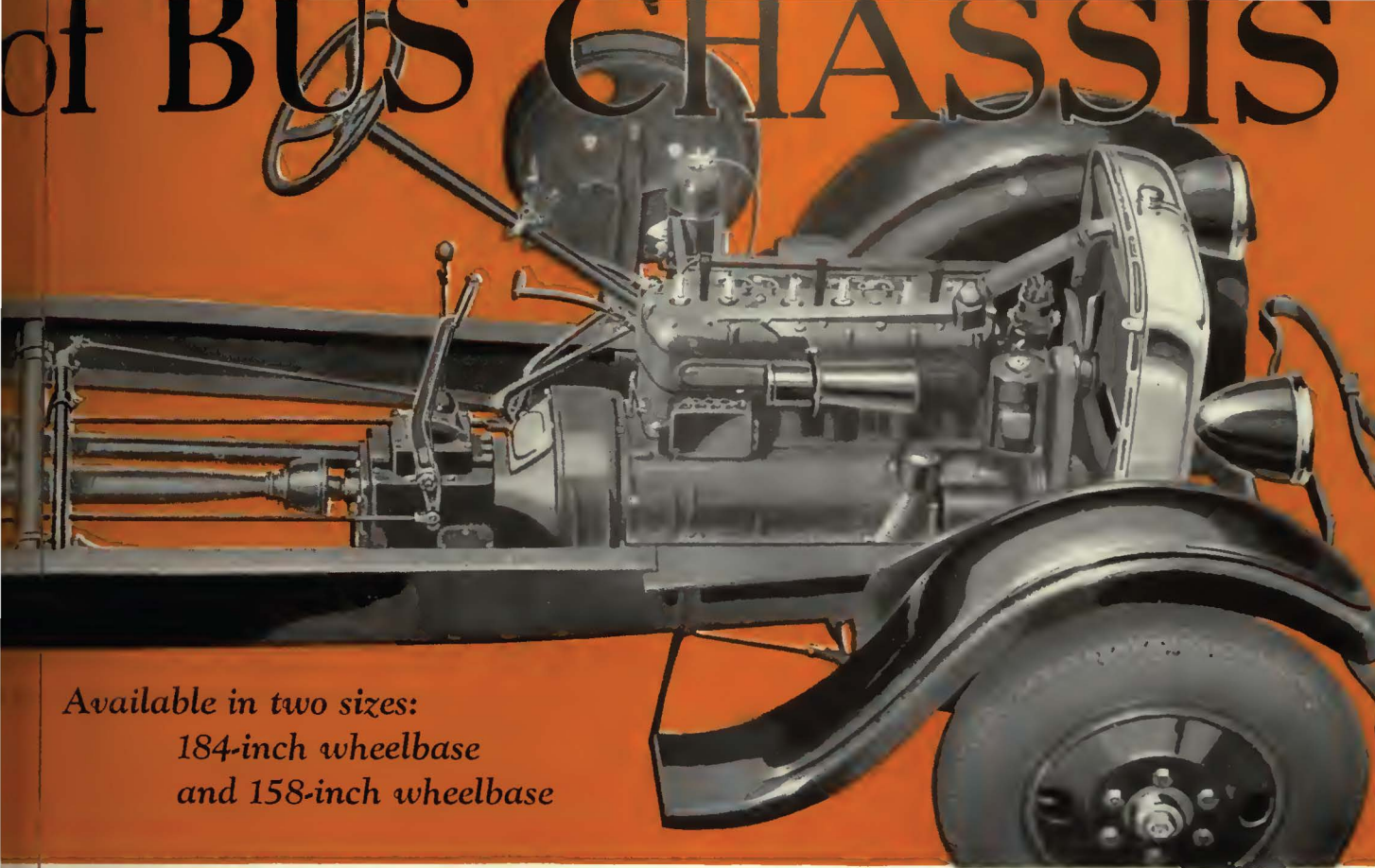
The MOST TALKED in America



The one street car type bus which
 possesses the essential elements for
 later profits is a Studebaker.
 It is as sturdy in both chassis and
 body as present engineering practice
 will permit.
 Its low first cost, low operating cost
 and low depreciation mark this bus
 as a profit maker.
 Its deep leather upholstery, wide
 seats and unobstructed vision give a
 degree of riding comfort not ordinarily
 found in street car busses.

The New STUDEBAKER 75 HEAVY DUTY

of BUS CHASSIS



Available in two sizes:
 184-inch wheelbase
 and 158-inch wheelbase

BROUGHT out in March, this year, the Studebaker "75" bus chassis has met with unusual success. Unqualified endorsement in the tangible form of orders from operators in all parts of the country, proves that this new type of chassis has met with popular favor.

built for the heavy demands of street car service, this chassis is a masterpiece of rugged construction. Its stamina has been proved by thousands of miles of grueling tests across the country and on the Studebaker proving ground.

The low center of gravity, obtained by a "kick-up" frame, prevents side-sway which is further taken up by the short shackles and wide springs. The result is greater safety and greater riding comfort. Nine stout cross-members, including two large hub units, give great rigidity to the 8-inch pressed steel frame. The transmission is of the 4-speed forward type—specially designed—as was the heavy duty rear axle.

Every operator of a Studebaker Bus knows, the Studebaker 75-horsepower motor is remarkably quiet and possesses a power reserve ample for the most strenuous schedules or difficult routes.

Because of the immediate acceptance of the "75" chassis, a demand developed for a chassis of similar

durability and power but designed for 12 to 18-passenger capacity. This is now offered in the "75" Junior chassis which possesses all of the essential features of the "75" except that it is 28 inches shorter, has one less cross-member and has a 3 speed forward transmission.

If you haven't seen the Studebaker "75" chassis ask your nearest Studebaker distributor to show you this latest development in bus engineering.

Studebaker Bus Models and Prices

"75" Model—184" Wheelbase—Dual Rear Wheels Chassis	
Chassis Only	\$3275
19-passenger Cross-seat Sedan*	5675
21-passenger Street Car Bus	5895
22-passenger Parlor Observation Car	6895
20-passenger Parlor Car De Luxe	6895
*Single rear wheels; for dual wheels add \$100.	

"75" Junior Model—158" Wheelbase	
Chassis Only	\$2410
12-passenger Cross-Seat Sedan	4160
15-passenger Cross-Seat Sedan	4520
Single wheel high pressure tires or dual wheels and balloon tires optional without extra cost.	

All prices f.o.b. factory. Purchase can be arranged on Studebaker's liberal budget payment plan

THE STUDEBAKER CORPORATION OF AMERICA
 Dept. B, South Elkhart, Ind.

Please send me a copy of Studebaker "Busse Link the Nation," without obligation.

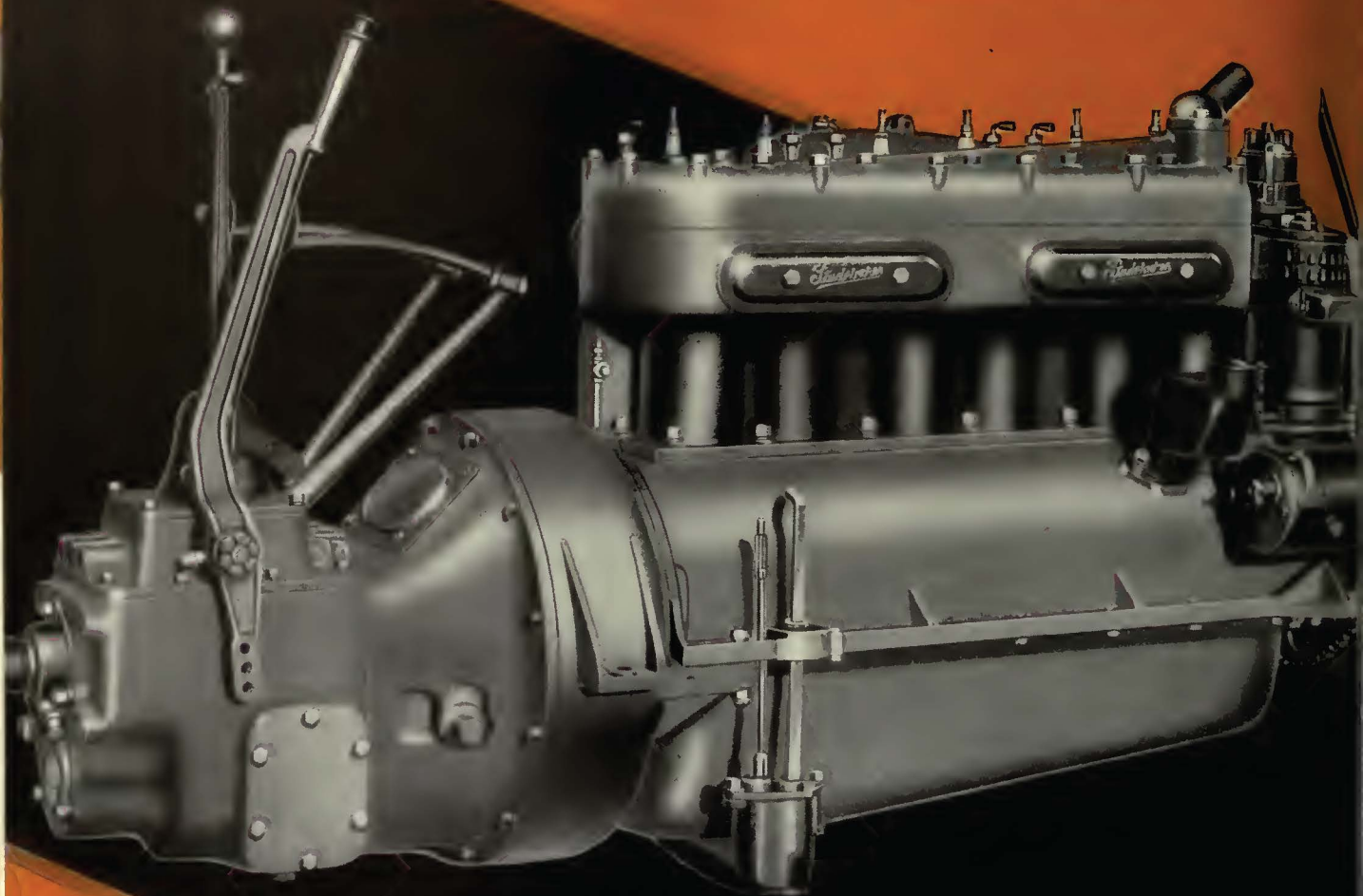
We have _____ buses at present. Circle number below the Studebaker Bus about which you desire information. Type: Sedan _____ Parlor Car _____ Street Car Type _____ Capacity _____ Passenger _____

Name.....

Address.....

DUTY CHASSIS

POWER PLUS SPEED



UNDER the hood of all Studebaker busses is the sturdy high-powered, six-cylinder engine that has earned the respect of bus operators everywhere for its unfailing ability to maintain schedules regardless of the loads carried or adverse conditions of road or weather.

Long fast runs under boiling rays of 100° sun, up steep mountain grades, bucking heavy snow or pulling through soft muddy roads—the Studebaker motor comes through on time—every time and no favors asked.

Designed and manufactured by Studebaker, this powerful engine is of the quiet L-head type. Compact unit power plant is mounted on its own subframe to insure perfect alignment between engine and transmission.

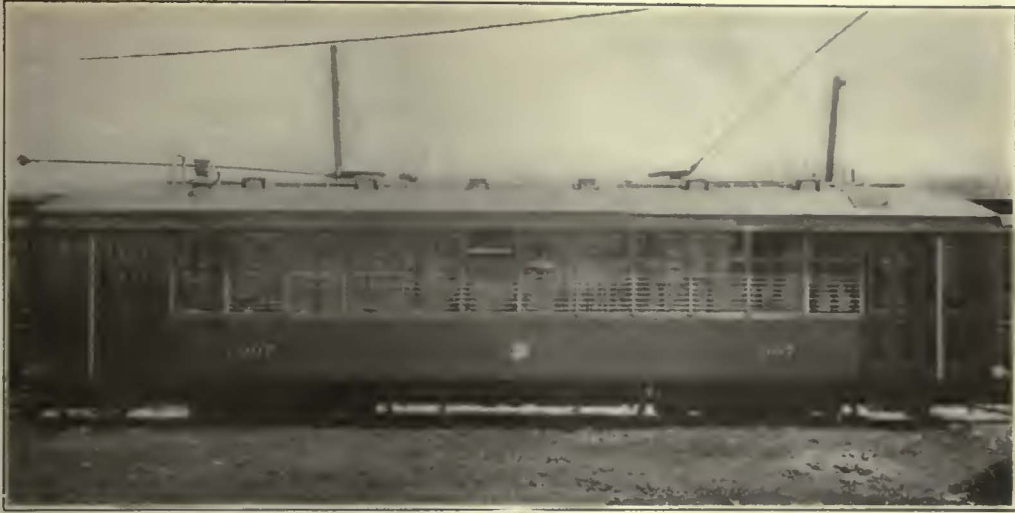
The bore is $3\frac{7}{8}$ inches and the stroke is 5 inches. Removable head, with combustion chambers exactly machined to uniform size.

The precision exercised in the building of Studebaker engines plus the quality of materials used, insure exceptionally long life and dependable, economical performance.

Many letters, received from bus operators in every section of the country, comment on the excess power and superlative performance of this famous Studebaker motor. Owners frequently operate their busses continuously on runs averaging between 200 and 300 miles a day, seven days in the week for months at a time without any attention other than changing the oil.

STUDEBAKER **75** HEAVY DUTY CHASSIS

MILWAUKEE



NP

MORE TREADLES FOR MILWAUKEE

MILWAUKEE was one of the first large cities to see the value of the Treadle Exit Door.

After an exhaustive test 162 treadle equipped cars were placed in service in Milwaukee in 1926.

In 1927 Milwaukee will have 232 Treadle Cars in operation, an increase of 70 Treadle Installations in twelve months.

There Must Be a Reason. Ask Them.

NATIONAL PNEUMATIC COMPANY

Executive Office, Graybar Building, New York

General Works, Rahway, New Jersey

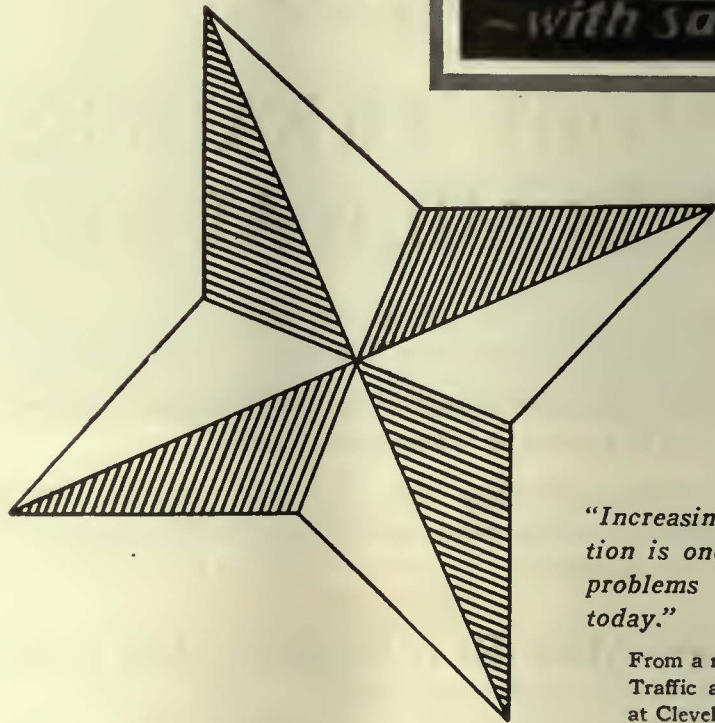
MANUFACTURED IN TORONTO, CANADA, BY
Railway & Power Engineering Corp., Ltd.

CHICAGO
518 McCormick Building

PHILADELPHIA
1010 Colonial Trust Building



Let's take a tip fro



"Increasing the speed of car operation is one of the most important problems before the industry today."

From a report of the discussions of Traffic and Transportation Association at Cleveland.

ur competitors!

It looks as though the automobile people are going to get themselves into trouble with their "speed" advertising.

But the fact remains that it has sold a lot of cars. Life moves at a swift pace these days. People have to get from place to place quickly. They want speed and they'll pay for it.

We, in the electric railway industry, might well take a tip from our competitors.

We could advertise speed without being accused of endangering lives, because we can give speed with SAFETY.

The new Cincinnati Duplex Air and Magnetic Brake, for instance, promises to revolutionize thinking on the subject of SAFE speed in both city and interurban service. Careful independent tests show that it will reduce average emergency stopping distance by 22-5 to 46 percent. To quote from an actual motorman's report made on a Kentucky property, ". . . . auto came off ——— Pike into High Street making about 30 miles an hour. The Magnetic Brake saved a serious accident."

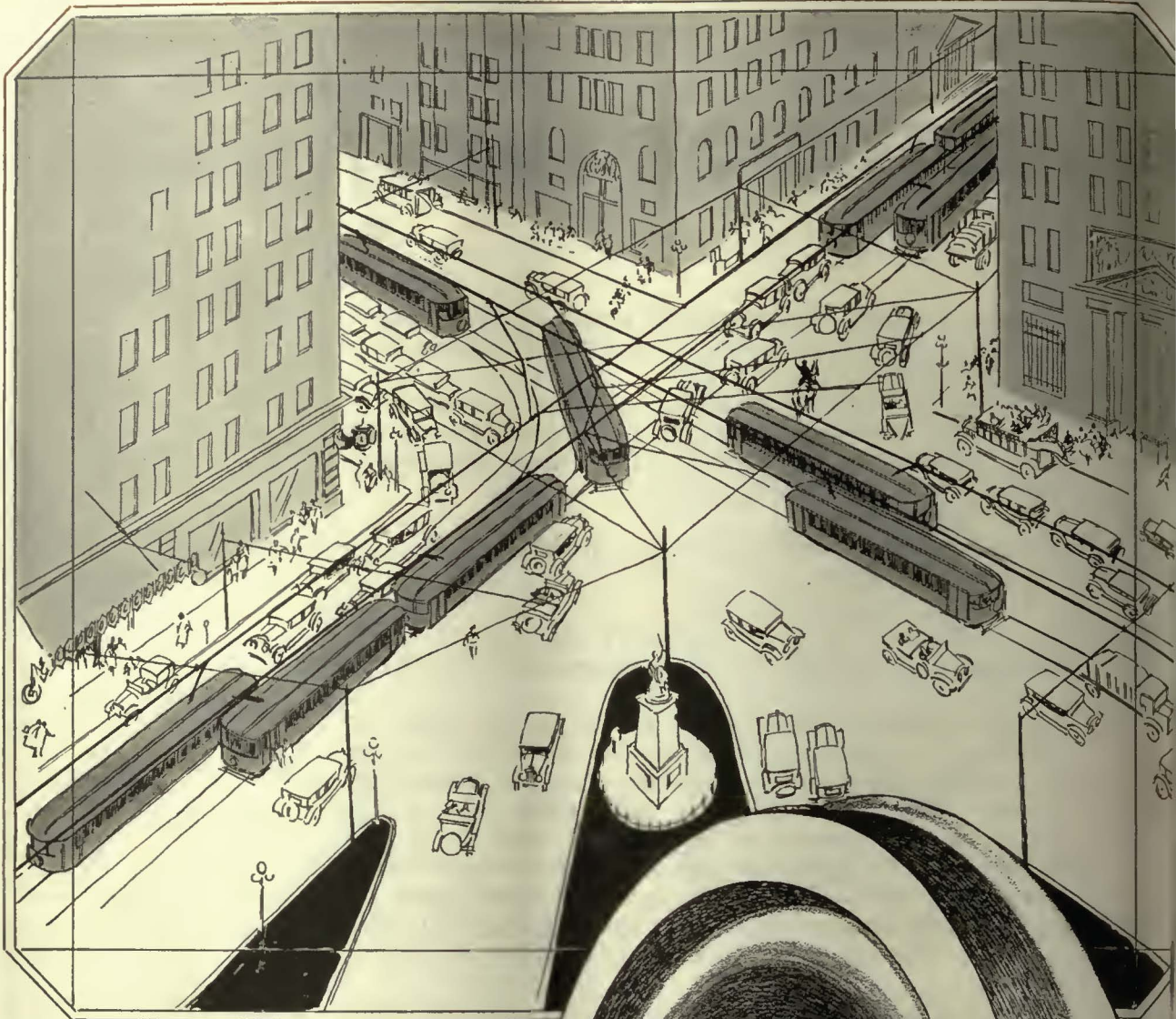
Remember too, that deceleration as much as acceleration helps make for fast schedules. Speed with SAFETY is a mighty strong argument to use against today's competition.

Write us.

CINCINNATI CAR COMPANY
CINCINNATI, OHIO

[The Duplex Air and Magnetic Brake is a feature of the Cincinnati Balanced Lightweight Car]

CINCINNATI **BALANCED LIGHTWEIGHT** CARS



Year by Year The Congestion Grows

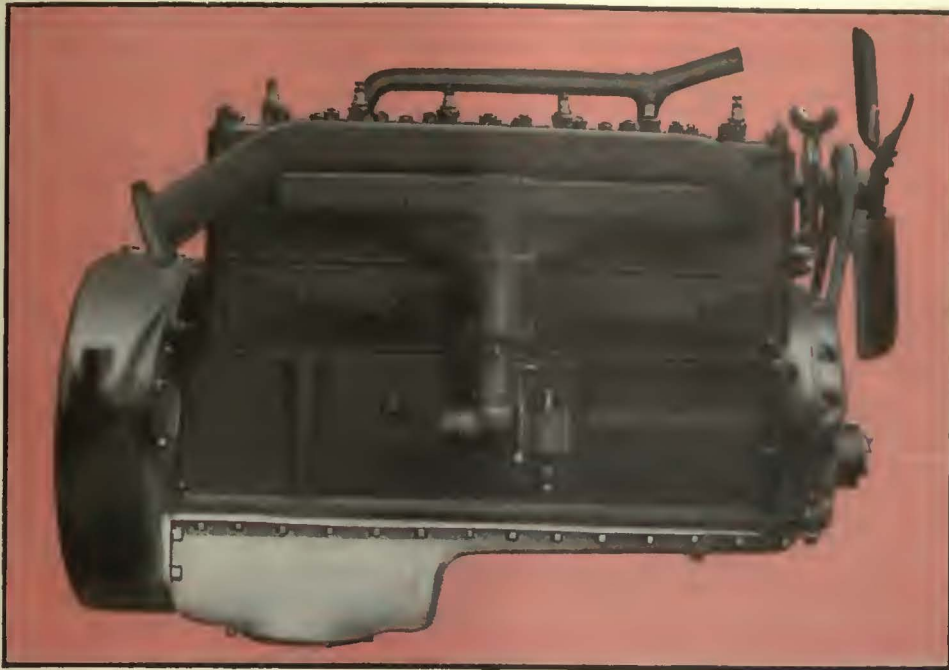
Year by year the country's population clusters more and more about the metropolitan centers. Business sections, crowded before, are beehives of congestion now—and regardless of how rapidly this congestion grows, the street car company is expected to provide adequate transportation facilities.

It is this requirement of 100% service in peak periods that causes the management of street car companies to be so careful of their operating equipment. It is this requirement also that is responsible for the widespread use of Gary Wrought Steel Wheels in electric railway service. A well made, wrought steel product—an iron-clad inspection system—an organization trained in electric railway equipment.

Our wheel engineers are at your command.

Illinois Steel Company

General Offices: 208 South La Salle Street
Chicago, Illinois



a-761-LC

**Smaller
Heavy Duty
Six by
Waukesha**

For lighter buses of sixteen to twenty passenger capacity, this engine was designed. Two models, now over a year old, have proved adequate to meet horsepower requirements and keep fuel consumption at a minimum. High power and maximum mileage are obtained thru the use of the "Ricardo Head" as on all Waukesha engines. A seven bearing crankshaft of unusually large diameter assures maximum smoothness of operation.

These engines, models 6-KS and 6-KU, follow the latest practice in engine design, having unusually short stroke, "Truncated" cylinders, "Girder" type crankcase and oil "Filtrator." Their bore is respectively 4 and 4 1/4 inches, while the stroke is 4 3/4 on both. The short stroke, large valves and "Ricardo Head" turbulence assure excellent flexibility in bus performance, a combination of good acceleration and top speed. Write for Bulletin No. 628 containing full information.

A79-LC

AUTOMOTIVE EQUIPMENT DIVISION

WAUKESHA MOTOR COMPANY
Waukesha Wisconsin
 Eastern Sales Offices *Eight W. 40th Street* *New York City*

Exclusive Builders of Heavy Duty Automotive Type Engines for Over Twenty Years



One of the Goodyear-equipped buses of the Tampa Electric Company, Tampa, Fla.

GOODYEAR

Copyright 1927, by The Goodyear Tire & Rubber Co., Inc.

The Public be Pleased!

Most important factor of all in the growth of any bus service is the public satisfaction with the service.

For out of public satisfaction comes public patronage, assuring the necessary revenue to meet expenses and make a profit.

And of all the elements in bus operation that contribute to public satisfaction, confidence and patronage, none is so essential as uninterrupted service.

The dependable, on schedule service that Goodyear Bus Tires do so much to maintain.

* * *

Goodyear Pneumatic Cord Bus Tires have a fine reputation for reliable, trouble-free, schedule-sustaining performance in motor bus service.

They may cost somewhat more in the first place than tires not so well built, but they more than make up any difference in first cost by what they save in uninterrupted revenue production.

Goodyear Tires are money-making and money-saving tires.

* * *

Goodyear Pneumatic Cord Bus Tires are more durable and more trouble-proof largely because they are made with SUPERTWIST—the new cord material which eliminates shoulder

breaks and other casing troubles.

This patented cord fabric was invented and developed by Goodyear to overcome carcass failures and diminish tire changes.

It is more elastic than ordinary cord fabric. Stretches farther before it breaks. Withstands flexing better and longer before “fabric fatigue” sets in.

* * *

The dependable, long-lived service they give is one reason why Goodyear Tires are used on the buses of the Tampa Electric Company, Tampa, Florida.

“For the past year we have been using Goodyear Tires on our buses operating city service,” writes Manager T. J. Hanlon, Jr.

“The local Goodyear Branch has rendered 100% service; the mileage we have obtained has been beyond our expectations, and tire failures on the road have been reduced to a minimum.”

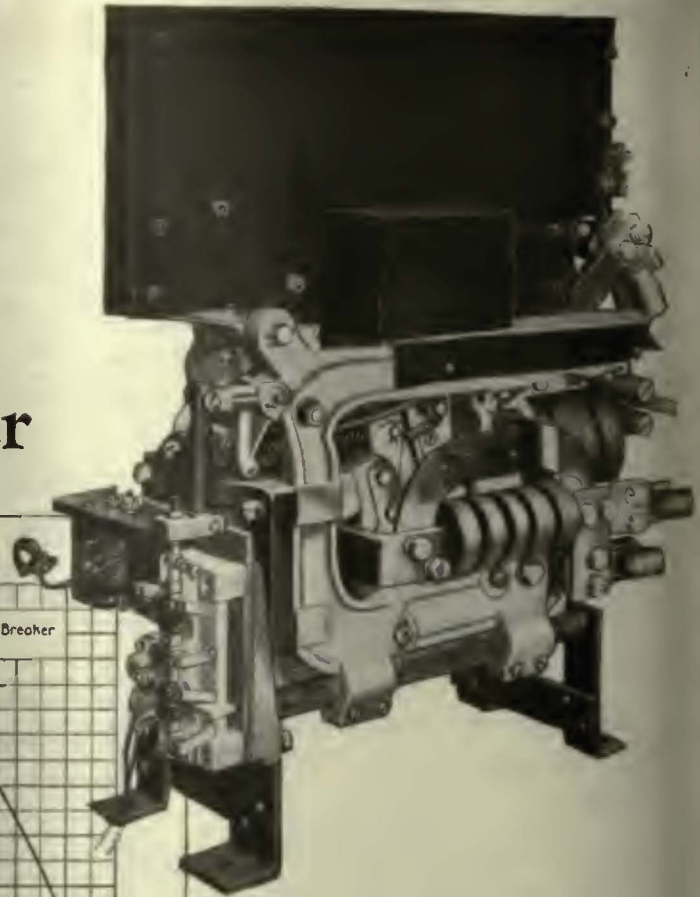
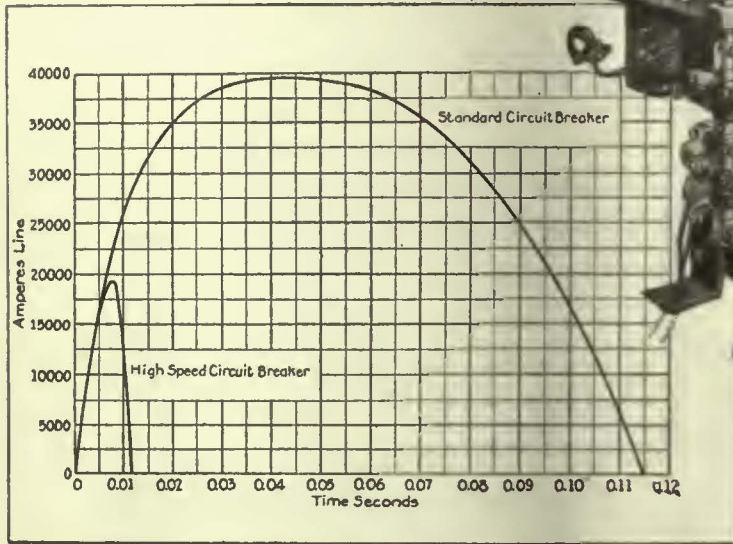
The mileages to which Mr. Hanlon refers include 39,021 miles for one Goodyear Tire, and still-in-service mileages of 26,826 for another; 25,207 for a third; 22,418 for a fourth; 21,667 for a fifth, and so on through a long record of reliable, trouble-free, low-cost Goodyear Tire miles.

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service

BUS TIRES

Made with SUPERTWIST

The G-E High-Speed Circuit Breaker



—and the measure
of its greater protection



Even a hasty glance at these two curves impresses one with the extremely high speed and the effectiveness of this breaker for limiting short-circuit currents. G-E high-speed Breakers have been giving ideal protection in hundreds of installations since 1917.

This type of circuit breaker has been uniformly successful in protecting substation apparatus, substation feeders, and electric locomotives. The reduction in current and flashing that results from its use greatly decreases wear of commutator and brushes and practically eliminates damage from internal grounding. It also insures greater reliability and lower substation maintenance.

GENERAL ELECTRIC

Electric Railway Journal

Consolidation of *Street Railway Journal* and *Electric Railway Review*
Published by McGraw-Hill Publishing Company, Inc.
CHARLES GORDON, Editor

Volume 70

New York, Saturday, October 29, 1927

Number 18

Why Favor the Minority?

CHECKS made of the customers arriving at prominent department stores in Detroit reveal that of the total 56.7 per cent come by street car, 24.2 by motor bus or trolley and 19.1 per cent by private automobile. This information is contained in the report of a traffic survey by the Detroit Department of Police, abstracted in this issue. Coupled with this finding is the following statement:

"Street cars using the natural highest speed lane and operating on a local stop service become slow-speed vehicles and, in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements."

With these facts before them, the authors of the report devote practically all their efforts to facilitate movement of the automobiles. Apparently there is no attempt to analyze the situation or to offer suggestions for betterment of conditions so far as the public carriers are concerned, whether street car or bus. True, comment is made on the trial of the "express-trolley, local-bus" system. This is contained in the meager statement, "It is believed that such a combined service would very materially expedite the flow of all types of vehicular traffic on any street where trolley cars are operated."

No representative of the street railway system was on the committee conducting the survey, which may account for the lack of attention to means for facilitating car movements. This, however, seems to be the defect of nearly every traffic survey of the sort made in an effort to expedite movements generally. More consideration should be given to the street car and bus systems, for it cannot be denied that they carry far more passengers in and out of the congested districts than do all the automobiles that can be operated on the streets. Why not put in the forefront of such investigations men who have spent their lives in studying the expeditious movement of traffic, and let them help in the attempt to move the masses more rapidly?

Tell the Man Farthest Down

CONGRESS will meet within a few weeks, so the time is rapidly approaching when the rate of income tax on corporations for the current year and future years will be determined. The responsibility lies upon the shoulders of all of us of grasping this unusual opportunity to end a glaring injustice at Washington. Corporations are paying 13½ per cent of their profits, of the profits of the stockholders, into the federal treasury—more than 2½ times as much as that paid by individuals and partnerships. Why not point out to the stockholders that they are being penalized? Why not send every last one of them on record a reminder of this federal discrimination and urge them to write their Congressmen? These latter gentlemen believe in the power of numbers, for numbers spell votes, so they will pay more attention

to such protests than to those of the allegedly selfish officers of corporations. Tell the stockholders that, no matter what their incomes are, they donate 13½ cents out of every dollar of the earnings of their enterprise to the federal government. Get the small stockholders busy.

Perhaps Congress does not know that upward of 20,000,000 citizens are small stockholders in corporations. A flow of letters into the offices of members from these investors will soon impress them with the importance of tax revision for the stockholders of corporations. These investors should remind their Congressmen, too, that a healthy revision of corporation income taxes will bring many more individuals into the class of income taxpayers, a social advantage the desirability of which will be seen when it is realized that out of our immense population, in excess of 100,000,000 people, only 4,171,051 filed returns for 1925 and only 2,501,166 of these were found taxable.

Tell the story to the man farthest down—he's the stockholder and the taxpayer! And get him to tell his story to his Congressman before the session opens in December.

Planning for the Future

UNLIKE many enterprises, transportation is characterized by its permanence. It is pre-eminently a long-term business. Communities expand along with the transportation service that is furnished. Since the future of the entire scheme of community growth is so intimately tied up with its transportation it naturally follows that there must be a stability to that service. Otherwise the members of the community will not be satisfied to make permanent investments of their own in factories, stores or offices, and homes.

So it is necessary for the electric railway executive to take a long-distance view of his business. Capital expenditures must be made over a period of years, and provision must be made year by year to carry the charges and to amortize the principal, or else to arrange for re-funding at the end of the term. Even where franchises are granted for specific periods they are for from 20 to 50 years. This indicates that there must be set up a budget of earnings and expenditures if any plan is to be made for producing the necessary income. Unless this is done capital cannot be attracted.

This long-term viewpoint was urged by several of the speakers at the recent Cleveland convention, particularly George E. Frazer, who advocated making budgets in terms of five to ten years instead of for a short period where results can be predicted more closely. Long-term estimates of this kind necessitate an intensive study of the revenue-producing qualities of the property's assets. If there are portions of the plant that the budget shows the company cannot properly finance and develop, then the budget will suggest the sale of these assets. The budget also should show whether or not other portions of the property are being used to greatest productivity, and

should suggest ways to improve situations that are not entirely satisfactory.

By making estimates of this sort it is possible to give the prospective investor a truer picture of what the future holds for the transportation property. Accordingly it is easier to interest him in the securities if the set-up is such as to inspire confidence in the management and its ability to carry out the plan as laid down.

Consistency—A Gem in Advertising Business

TO ADVERTISE electric railway rides, while a preposterous idea a generation ago, is now a necessary concomitant of successful operation. The street railway or, indeed, any utility is doomed to die unless through at least one of the sundry media it has reached the man in the street. In one year, according to statistics, public utilities spent approximately \$25,000,000 for advertising, of which 63 per cent was used for space in the daily newspapers. Other methods are becoming popular now, for instance the movie, with its unusual opportunity for enlightening while the same time entertaining, and the radio, which will transmit to the listener a true story of the railway's place in the transportation world.

True it is that the use of any amount of newspaper advertising will not direct attention away from the untidy and discourteous conductor, the ramshackle, paintless car and the surly management. Few properties have failed to learn that correction of such matters is an essential of service. Now it is a matter of what can be accomplished with an appreciable amount of properly placed advertising and with the well-trained, well-educated employee and brightly decorated cars and coaches operating as personal salesmen. It is not a debatable point any longer. Advertising sells rides. A well-planned merchandising campaign undertaken by any railway management will cost money, but carried on consistently and courageously over a period of years, even if some of the years be lean, will bring satisfying results, provided, of course, the promise in the advertisements is fulfilled in a service that not only satisfies but also stimulates. Then the result is good will, than which there is no better yield.

Forward Steps in Traffic Regulation

OUTSTANDING in the directed efforts to solve the traffic problem, which was discussed at length in several meetings at the recent Cleveland convention, are the extensive surveys made in some of the larger cities, such as San Francisco, Detroit, Los Angeles and Newark. Street railways co-operating with civic and industrial bodies have contributed in certain of these instances in gathering traffic data and finding means for more efficient use of streets. A general feeling of good will has characterized their participation. Several suggested plans for relief included in the reports have been adopted, or at least given a trial, with satisfactory results. In Detroit the express-trolley, local-bus system, a traffic relief measure advised, is being given a trial on one of the principal lines. Another example of specific action taken is the adoption in Los Angeles of the loading-zone rule, a regulation which has proved effective in eliminating double-line standing of automobiles.

In almost every survey it was discovered that stops due to traffic signals and officers were the chief cause of car delays. Properly designed systems of co-ordinated control are the results of study on this subject. Chicago, Cleveland and Los Angeles have proved the worth of

these properly timed devices, which are now being adjusted in other cities.

Another cause of delay and general vehicular obstruction is loading. The use of loading platforms and zone employing the pay-as-you leave collection system on cars outbound in the congested district, installing double entrance doors and educating the public to board quickly have all helped to speed up loading. Numerous infractions of parking regulations have also caused much trouble and interference with street car and general vehicular movements. Reports of the many violations have prompted cities to enforce more strictly the existing ordinances.

A big step in reducing car delays has been the modernization of equipment, permitting better acceleration and braking. Several companies in the past year have purchased new rolling stock or have rehabilitated their present equipment. Lighter cars, better powered, are certain to improve traffic flow.

The Hoover Conference recommendations on motor vehicle operation have proved invaluable. The interest shown by the government in solving the great traffic problem of the nation is itself significant of the importance of the situation.

Is Scottish Frugality a Myth?

BRITISH tramway properties follow the commendable practice of publishing in their annual reports extended statistics of operation, among which many of the properties include a tabulated list of the articles turned in to their lost and found departments. These lists are not greatly different from those which might be compiled for American railways, but when published for an entire system they show some surprising details as well as totals.

For instance, the figures in the last annual report of the tramways of Aberdeen, Scotland, rather destroy the legend that the Scotch are supercareful in the attention which they give to their property, or at least that it is so when they travel on the street cars. The lost property returns from Aberdeen also show—at least on the surface—a great and unexplainable difference in forgetfulness between Scottish ladies and the men in that northern country. Otherwise, why should the lost and found department in Aberdeen report the amazing total of 583 ladies' umbrellas left in the cars during the year, as compared with only fifteen umbrellas belonging to the sterner sex? Of course, it would be improper to assume that the forgetful person with the lady's umbrella always belonged to the fair sex. Husbands have been known to borrow their wives' umbrellas and leave them on street cars. But there could not have been very many instances of this kind, because practically the same ratio applies to gloves left on cars in Aberdeen. No man was ever known to borrow his wife's gloves, but the statistics from the city show that there were only 41 gentlemen's gloves abandoned on the corporation's cars and buses during the year, whereas the number of ladies' gloves left during the same period amounted to the amazing total of 1,019.

Not only in these figures but in others farther along in the list the men come off triumphant in this test of comparative absentmindedness. To quote only one instance: During the year only 38 pipes and 52 tobacco pouches were left in Aberdeen cars. The owners of these articles almost certainly must have been men, because while ladies may like cigarettes they are not addicted to the pipe.

There are other notable items in the list of lost and found articles on the Aberdeen cars. They include

...ans, 34 boots and shoes, the same number of spectacles, a go-cart and a violin case. But if these records are a surprise, what shall be said of the statement that 35 bibles and hymn books were also abandoned? Were these forgotten through the abstraction of their owners in worldly thought, or because they became engaged with some fellow passenger in one of those theological discussions for which Scotland at one time was—and still is—famous?

These records again emphasize that, after all, the street cars in Aberdeen as well as elsewhere are simply microcosms—miniatures of the world at large. The lost and found department record in Aberdeen, like that in any American city, is but a reflection of human nature, which is much the same everywhere.

High-Pressure Community Development Brings Transportation Difficulties

COMMODITY selling by high-pressure methods is no longer in great favor among progressive manufacturers. Not so long ago it was common practice for the manufacturer to go after every available market without considering the ultimate suitability of his product to the need of the consumer. Sales and still more sales was the slogan. Today the most successful selling campaigns are directed first to finding the market's needs and then producing the kind of products that meet those needs.

Real estate development companies might well adopt the philosophy which experience has taught the manufacturers. Many of the realtors, as they like to be called, are engaged in high-pressure development schemes planned without consideration of their ultimate effect on the community. Greater and ever greater population is their objective. Of course there is nothing inherently harmful or wrong in population increase. For best result, however, it should be obtained in a natural and orderly way rather than by aggressive campaigns to sell land.

The difficulties that follow from an extremely rapid increase in population are well illustrated by the recent experience of the Long Island Railroad. Within a generation the western end of Long Island has been changed from a rural district to a densely populated suburban community. To some extent this change has been natural and inevitable. To a large extent, however, it has been the result of deliberate efforts to attract more and more people to live there. So successful have been these efforts that the Long Island Railroad now carries almost 100,000 passengers a day into and out of its New York station. The commuters complain that the railroad fails to provide them with adequate facilities. The management asserts that its facilities were designed with a view to trunk-line operation and that the congestion is caused by the tremendous number of short-haul riders, who should be cared for by the New York City rapid transit system. To anyone who considers this problem with care it is obvious that the railroad cannot afford to provide accommodations of trunk-line quality for passengers who ride only a few miles and pay only a few cents fare.

Under existing conditions the long-haul passengers have to suffer on account of the short riders. The real estate developers, however, ignore this fact entirely. They are clamoring for more service to accommodate more people and, of course, to sell more land. The solution of the problem does not lie in this direction. The proper development of Long Island should not be hampered by lack of adequate transportation facilities, but they will not be secured there or anywhere else by

fencing between the local interests and the railway. What is needed is less bickering and a greater desire to understand each other's needs and point of view.

Chicago Tackles Its Settlement Problem Again

STEP by step Chicago is getting around again to the consideration of its transit problem. The latest move is presentation of the tentative draft of a new indeterminate permit bill to the sub-committee of the Council on local transportation. This same committee had previously approved the bills dealing with the subjects of subway construction, consolidation, a local transit commission and repeal of the twenty-year limit on electric railway franchises. It was to be expected that the voice of the objector would be heard, and it has been raised, particularly in criticism of the indeterminate franchise plan. This is the feature regarded by the companies as most vital of all to the solution of the problem. Mr. Lisman has renewed his offer in modified form, and the advocates of municipal ownership, with Carl D. Thompson, secretary of the Public Ownership League of America, as their most recent spokesman, have raised their voices in opposition to the acceptance of the plan favored by executives of the surface and elevated lines for fear that it would absolutely preclude any chance of the city to own its local transportation system.

These are merely some of the angles. A final meeting of the sub-committee to approve and recommend the entire set of bills to the full committee on transportation will be held on Nov. 2. To attempt to comment constructively on the measures in anticipation of that meeting would be foolish. To attempt to prognosticate the course the matter will now take would be to speculate about intangibles. The thing that is significant just now is that the matter has again become one of public discussion. It is to Chicago's interest as much as it is to that of the companies that the matter be settled, settled quickly and adequately. It will do no good to castigate the city for its indifference of the past. It is to be hoped that good plans, carefully matured, will meet a better fate than did the bills advanced last year.

Co-ordinated Service Ahead in Indianapolis

CITIZENS of Indianapolis may well be pleased with the prospect of the Indianapolis Street Railway taking over the Peoples Motor Coach Company under a plan that contemplates co-ordination of the two services. This is as it should be. It was a long controversy this, culminating in an appeal by the railway to the Public Service Commission to approve the purchase deal. With that proposal the commission found fault on the score of the price to be paid for the bus carrier and on the matter of the ability of the railway to finance the purchase on terms not onerous to itself. With these strictures the court did not agree.

There is no need to go into that matter here, except to emphasize that the decision stands out as the first one of its kind under the recent law which gave carriers the right to appeal to the courts from decisions of the state regulatory body. There was a real chance for honest difference of opinion over the issues involved in this case. The important point now is not that there never should have been two systems of public passenger service in Indianapolis, but that the city is at last to enjoy co-ordination under conditions that augur well for satisfactory performance by each type of transport operated intensively in the field for which it is best suited.

Two Transit Reports

Presented in New York

WITHIN the past few weeks two notable reports on the New York transit situation have been published. The first is the report of Samuel Untermyer to the Transit Commission reviewing the series of hearings that have been going on for a period of several months before the commission. The second is the report of Major C. E. Smith to City Comptroller Charles W. Berry, answering two specific questions asked him by that official. This latter report was made public on Oct. 24, although preliminary copies were reviewed by several New York daily newspapers previously. The two reports contain so much vital information, and differ so much in their interpretation of the transit problem, that some knowledge of them is essential to an understanding of the situation.

Some of the salient points of the Untermyer report were reviewed in this paper, issue of Oct. 1, page 606, and a still briefer outline of the preliminary draft of the Smith report was given in the issue of Oct. 8, page 717.

Recommendations of Samuel Untermyer, special counsel to the New York Transit Commission, and C. E. Smith, consulting engineer to the City Comptroller, differ widely. The former desires recapture of existing lines for operation at 5 cents, while the latter proposes unification at a fare to cover the cost of service

Samuel Untermyer, special counsel of the Transit Commission, at the request of that body summarized and reviewed the most material features of the testimony taken before the commission in its studies and investigations leading to a plan of readjustment for the relief of the emergency which has been declared to exist, and for the improvement of service in New York City. Mr. Untermyer's findings are published in a 135-page report with many additional exhibits. Much of the report is devoted to quotations from the testimony of operating officials.

The plan submitted in this report is based primarily on recapture of city-built rapid transit lines with the purchase or condemnation of such portions of the privately built systems as are considered necessary to the formation of an independent municipally owned system, with a revision of the city debt limit to make possible the issue of the necessary securities. The following digest, which gives the high spots only, indicates the procedure recommended for making this possible.

The Untermyer Report

THE city immediately shall terminate all leases of its subways to the New York Rapid Transit Company, subsidiary of the Brooklyn-Manhattan Transit Corporation, and to the Interborough Rapid Transit Company and pay the recapture prices. The city shall buy all the property and assets of the I.R.T., including the Manhattan Railway Company's elevated system, and subways owned by the former company. The city shall form a rapid transit system of these subway and elevated lines.

A corporation shall be formed under the direction of the Transit Commission to lease and operate the rapid transit system thus formed. This corporation shall have a nominal share capital and shall have power to issue securities, to form subsidiary companies if needed and to appoint officers necessary to carrying on its operations. This corporation shall be named "The Board of Transit Control."

The board of directors of the corporation shall consist of nine members, appointed as follows:

- Chairman of Board of Transportation of New York City.
- Comptroller of the city of New York.
- Nominee of the Mayor of New York.
- Nominee of Real Estate Board of New York.
- Nominee of Merchants Association of New York.
- Nominee of Brooklyn Chamber of Commerce.
- Nominee of Queensboro Chamber of Commerce.
- Nominee of Bronx Board of Trade and Bronx Chamber of Commerce.

The ninth director shall be elected by the first eight selected and shall be president of the corporation.

The Mayor of New York is a member of the board of directors ex officio.

Terms of years of tenure of office of the directors are staggered. The directors serve without compensation, but a nominal sum (\$450) is suggested which will be apportioned

among those present at board meetings or meetings of the executive committee (\$250). No one holding public office is eligible to the board of directors with the exception of the city officials noted.

The board of directors appoints: One or more vice-presidents; a treasurer and assistant treasurers; a comptroller; a general counsel and assistants; a general manager and assistants; a secretary and assistants; a purchasing agent and assistants; such other officials as may be needed.

All contracts and purchases of material and supplies in excess of \$1,000 shall be awarded on the basis of competitive bids in conformity to specifications.

The lease shall be 25 years and for renewal terms as may be agreed upon.

The lines shall be operated on a 5-cent fare basis until otherwise required by law.

Gross revenues of the corporation shall be applied as follows: (a) Operating expenses, including overhead charges; (b) maintenance of the properties; (c) fixed charges on underlying liens of property taken over; (d) payment of interest and sinking fund upon the total investment of the city in the leasehold properties; (e) the construction of additional subways and betterments and extensions of existing subways.

If the net revenues are insufficient to meet all the above requirements the city shall make good the deficiency. But on new property expenditures of \$100,000 or more the corporation must get authority from the Board of Estimate and Apportionment of the city of New York. A referendum of the people shall be had to vote on their agreement to meet with general taxation returns any deficits that may arise by reason of the 5-cent fare.

The Board of Transit Control shall be under the supervision of the Transit Commission.

It is recommended that the constitutional amendment to

and New York City \$300,000,000 be passed and the money be used to recapture and purchase the rapid transit lines included in this plan.

I.R.T. SUBWAY PROPERTIES INCLUDED

equal Contracts No. 1 and No. 2 between the city and the I.R.T. cover subways built prior to 1913. These include lines in Atlantic Avenue along Flatbush Avenue and Fulton Street to Bowling Green and from South Ferry north to Grand Central, west to Times Square on 42nd Street and thence north on Broadway to 96th Street. Two lines north of 96th Street are included, one going to Broadway and 242nd Street (in Cortlandt Park) and the other to Bronx Park and 188th Street.

Under the lease under which these properties are operated by the I.R.T. has no recapture clause but the properties revert to the city upon expiration of the contracts in 1967. The I.R.T. pays the city an annual rental of \$2,655,569 for the year ending June 30, 1927, and this sum meets security and sinking fund requirements of the sums invested by the city in these subways. Immediate termination of these contracts and the incorporation of these lines in the city rapid transit system are recommended.

Under terms of Contract No. 3 between the city and the I.R.T. additional subways were constructed. These include: Seventh Avenue line from Times Square to Chambers Street and branches to South Ferry and Borough Hall, Brooklyn, respectively; Lexington Avenue line from Grand Central to 138th Street, Bronx, and two branches, one to Jerome Avenue to Woodlawn Road and the other along Southern Boulevard to Pelham Bay Park; the Eastern Parkway line; the Queensboro subway; the White Plains Road line. The contract with the I.R.T. for these subways contains a recapture clause and immediate recapture and the inclusion of these lines in the city rapid transit system is urged. The cost of recapture of the East Side line only on Jan. 1, 1929, is given as \$14,000,000.

Mr. Untermyer advocates the purchase of the entire I.R.T. subway properties and of the Manhattan Elevated Railway Company properties for a total sum of \$245,594,000 in the form of 38 and 50-year 3 to 3½ per cent city bonds.

THE B.-M.T. PROPERTIES

Contract No. 4 between the city and the N.Y.R.T.Co. (B.-M.T.) covers practically all the subway properties of the B.-M.T. system. This contract contains a recapture clause and Mr. Untermyer recommends the city take over the B.-M.T. subways and incorporate these properties into the city rapid transit system. The recapture price given in the report is \$62,000,000 as of Dec. 31, 1928. The report continues:

It is estimated that it would cost, at 1926 construction prices, at least \$347,180,000 to reproduce the recapturable city subways and equipment of the B.-M.T. system in which the city has an investment as of June 30, 1926, with accumulated unpaid interest and sinking fund charges of \$209,333,000, all which the city can recapture as of 1927 for \$50,774,000. The B.-M.T. is drawing practically its net profits from this property, while the city is getting nothing and has no immediate hope of realizing anything by way of return on its investment so long as the present condition continues.

WHY SURFACE LINES SHOULD NOT BE INCLUDED IN THE PLAN

Mr. Untermyer believes that the surface lines should not be included in the plan for the following reasons:

1. They are losing money, not even earning their fixed charges.

2. It would involve the impossible task of negotiating with each of 43 companies included in the seventeen operating systems, with separate forms of outstanding securities.

3. Many of the companies have fixed assets with no corresponding earnings; many are not earning their fixed charges; others are barely meeting operating expenses; while still others are operating at a steadily increasing loss. Thousands of various classes of security holders would have to be consulted and their consent secured.

4. Taken in their entirety they are not earning within \$465,792 of their fixed charges for the year ended June 30, 1927, and their funded debt exceeds the value on an original cost basis of their physical assets by \$60,295,000.

5. Inclusion of the surface car lines is not necessary to or an integral part of the plan. Their inclusion in any plan would inevitably spell the deathknell of the 5-cent fare, and unnecessarily so. If that were its deliberate purpose it could not be more effectively accomplished.

Although the surface car lines carry 35.3 per cent of the total city passengers, the growth and development of the city involves only the unification of the rapid transit lines, the extension of the transit facilities on them into the new sections of the city and the increase of rapid transit facilities to ameliorate the present intolerable congestion and service.

The continued operation of the surface lines is, at least for the present, essential to take care of the short hauls and as feeders to the rapid transit lines, except to the extent they may be replaced by buses and subway extensions. There is, however, no reason why the city should assume the burden of their increasing difficulties of operation due to traffic congestion and other causes, if it were financially able to do so, which it is not, or why it should take over the burdens of the steadily increasing losses, nor the uncertain risks of further losses from new competition from buses and additional subways. This is precisely the psychological moment not to take over the surface car lines, when we do not know and have no means of estimating the effect of bus operation. If it should hereafter be found desirable to include the surface lines in a more comprehensive plan and their owners can agree on a reasonable price, there is no reason why that proposition should not receive independent consideration on its merits. It is not practicable at this time.

The elevated roads are equally essential to the rapid transit system of the city. Of the 1,807,000,000 passengers carried by the rapid transit lines, the elevated lines carried 628,000,000 in 1927. The city cannot do without these facilities at this time nor until more subways are built to take their place.

OPERATING STATISTICS

In his report Mr. Untermyer gives many detailed statistics regarding the properties. The following have been selected as showing the magnitude of the proposition and the relative sizes of the various elements involved:

TOTAL ROUTE MILEAGE, JUNE 30, 1926			
Subway	.....	116	
Elevated	.....	96	
Surface	.....	516	
			728
AUTHORIZED AND CONTEMPLATED MILEAGE			
Subways	.....	63	
Total	.....		791
REVENUE PASSENGERS, BASED ON FARES AS OF			
		JAN. 30, 1925	1926
Subways	.....	1,074,000,000	1,147,000,000
Elevated	.....	607,000,000	605,000,000
Surface	.....	1,013,000,000	997,000,000
Total	.....	2,694,000,000	2,749,000,000
			2,831,000,000
VALUATION ON ORIGINAL COST BASIS, JUNE 30, 1926			
Subways	.....		\$560,000,000
Elevated	.....		180,000,000
New City Subway (est.)	.....		643,645,000
Total	.....		\$1,384,422,000
VALUATION ON REPRODUCTION LESS DEPRECIATION BASIS			
Subways	.....	\$943,440,000	
Elevated	.....	221,155,000	
New City Subway	.....	643,645,000	
Total	.....	\$1,808,240,000	
BOOK VALUE AS OF JUNE 30, 1926, BEFORE DEPRECIATION			
Subways	.....	\$574,137,000	
Elevated	.....	253,662,000	
Total	.....	\$827,799,000	
VALUE OF SURFACE CAR LINES			
Original cost basis	.....	\$131,857,000	
Reproduction cost basis	.....	188,161,000	
Book value	.....	252,557,000	
FUNDED DEBT, JUNE 30, 1927			
I.R.T.	.....	\$209,000,000	
Manhattan Railway	.....	105,206,000	
City Contracts 1 and 2	.....	57,092,000	
N.Y.R.T. Corp.	.....	114,132,000	
City Contracts 3 and 4 and balances on Contracts 1 and 2	.....	254,015,000	
City Contract (New Subway)	.....	69,503,000	
Total rapid transit	.....	\$809,870,000	
Surface car lines	.....	204,592,000	

	GROSS INCOME		
	1926	1927	1927
Rapid Transit	\$34,048,000	\$34,153,000	
Surface Car Lines	7,851,000	7,581,000	
NET EARNINGS AND LOSSES—ALL PROPERTIES			
	1925	1926	1927
I.R.T., Subways ...	\$4,188,000	\$6,395,000	\$6,289,000
I.R.T., Manhattan Div.	4,534,000D	4,126,000D	4,909,000D
N.Y.R.T. Corp.	3,861,000	4,684,000	5,484,000
Total Rapid Transit City, approximate ...	\$3,515,000	\$6,953,000	\$6,864,000
	10,500,000D	11,100,000D	13,600,000D
Total Rapid Transit Surface Lines	\$6,985,000D	\$4,147,000D	\$6,663,000D
	2,066,000D	2,072,000D	2,466,000D
Total on transit system	\$9,051,000D	\$6,219,000D	\$9,102,000D

D indicates loss or deficit.

Text of Statute—P.S.C. Sec. 106

THE procedure recommended by Mr. Untermyer is based on the statute known as the Public Service Commission law, section 106. Since some knowledge of the statute is essential to an understanding of the situation, the principal points included in it are given very briefly below.

The Transit Commission after making the necessary studies and investigation shall prepare a plan of readjustment for the relief of the emergency which is hereby declared to exist, and for the improvement of transit in such city. Such a plan shall contain provisions which in the judgment of the commission will accomplish as nearly as may be the following purposes: (1) The combination, rehabilitation, improvement and extension of existing railroads so that service thereon may be increased and improved to the fullest extent possible; (2) the receipt as soon as practicable by the city of sufficient returns from the operation of the railroads so that the corporate stock or bonds issued by the city for the construction of rapid transit railroads may be exempt in computing the debt-incurring power of the city and (3) the assuring to the people of the city the continued operation of the railroads at the present or lowest possible fares consistent with the just valuations of, the railroads and their safe and economical operation. . . . It shall consider the incorporation in the plan of provisions whereby the title to such railroads as are not

already owned by the city and whose ownership thereby is deemed by the commission to be desirable may be vested in the city return for a lease of such railroads by the city. . . . The commission shall cause a valuation to be made of the property, other than franchise or going value, necessarily used in public service of the railroads included in the plan. . . . The commission shall consider the incorporation in the contracts to be entered into to carry such plan into effect of provision for a board of control to have supervision and control over the management and operation of the railroads included in the plan . . . to be known and designated as the Board of Transit Control, with authority to issue securities, etc. . . .

Simultaneously with the above, Major C. E. Smith, consulting engineer, St. Louis, conducted a study of two problems on the transit situation for City Comptroller C. W. Berry of New York City. The two problems submitted were:

QUESTIONS ASKED BY COMPTROLLER BERRY

1. What can be done with the old subway lines plus the possible utilization of such parts of the new construction as may be available to afford transit relief to the traveling public while the entire system is being completed?

Such relief to be either temporary or permanent or a combination of both. Correction of present conditions in the shortest possible time being the principal factor.

2. Is the plan that has been proposed and presented to the new administration the best one for the entire city? Will the proposed system upon completion provide, as far as our transit experience and available expert engineering knowledge can make humanly possible, the maximum in the way of modern rapid transit facilities for our ever-expanding municipality?

How is this great undertaking to be paid for?

How is the system to be operated, and by whom, when it is completed?

The answers to these questions, together with three brief appendices, form a 95-page volume as submitted by Comptroller Berry. Only the principal points are included in the digest which follows:

The Smith Report

ALL New York transit systems should be merged and all operated as a single unified system by the present rapid transit companies, the latter to be merged eventually into a single company. This transit system should be made self-supporting, partly by fares which should fluctuate up and down with variations in the cost of service and partly by a tax on the special benefits to particular property resulting from rapid transit construction and not subsidized by the general taxpayer. Better service can be provided with higher fares, and ample subways can be provided for comfortable transit at a reasonable fare.

Elevated and surface lines are not obsolete nor inherently losing ventures. Their lack of profits is due to the competition of the city-owned subsidized subways. The old elevated railroads must be tolerated until a great deal more money is available and, in the meantime, their revenues should permit them to give good service.

Motor buses to handle all surface traffic would number more than fifteen times the Fifth Avenue buses at an increased cost of many millions of dollars in fares and would introduce serious traffic congestion.

Recapture of city-owned rapid transit lines would present complicated legal, operating and financial problems, and either disrupt present routes and require more fares to be paid or possibly increase fares on the company lines. The recaptured lines would only handle 25 per cent of the present rapid transit traffic. The independent city system of subways now under construction is much more expensive than necessary to give transit relief.

PRIVATE OPERATION DEEMED BEST

The best results for New York transportation will be secured by private operation, state regulation of service, methods and practices and city control over constitution,

franchises, contracts and general policy. In every transportation system there are so-called "cream" lines that yield the profits which support the so-called "lean" lines. Yet the latter are very necessary. It would not be an accomplishment to separate the lines in order to secure a system of profitable lines if by so doing the "lean" lines would have greater difficulty in giving satisfactory service.

The subways are so congested that the companies do not now need any increase in fares so long as the people accept the present quality of service and the city makes the taxpayers pay the fixed charges on the city's investment. The cost of a ride on the subways is 5 cents, plus the city's tax exemption plus the carrying charges on the city's investment. If the subways had paid the same amount of taxes per passenger as the Manhattan Elevated Railway and also the city's carrying charges, the fare on the I.R.T. subways for nine years, 1919-1927, inclusive, would have averaged 6.14 cents. This average fare on the Manhattan Elevated and the surface lines will secure improved service and relieve the companies from unfair financial troubles.

PROPOSED PLAN OF JOINT OPERATION

The best solution of the transit problem is by an agreement between the two operating companies and the city that the present lines will be operated as one in the interests of the best service to the public, the earnings pooled, the fares fixed to meet the entire cost of service, including the city's interest and sinking fund charges, and new subways to be merged into the present system, the plans changed so as to provide for the necessary additions to form a comprehensive system instead of the proposed competitive system now under way.

No other charges would be necessary—no financial mergers, no swapping of securities, no issue of city bonds

to recapture or purchase, except for the purpose of reducing the annual charges. Each company would operate its own lines and jointly operate new lines or reach agreements as to their operation. There is no doubt that before many years one company would be dominant in control, a consummation devoutly to be wished.

Changes in the dual contracts are proposed as follows: A portion of the N.Y.R.T. (B.-M.T.) return of \$3,500,000 per year and an additional amount if necessary to be agreed to as payment for the amortization of the "existing railroads" at an agreed valuation.

A portion of the I.R.T. return of \$6,335,000 per year and an additional amount if necessary to be agreed to as payment for the amortization of the "existing railroads" (Contract No. 1 and No. 2 subways) at an agreed valuation.

The 7 per cent on \$60,000,000 stocks and Manhattan Elevated preferential of \$1,589,348 to be replaced by 5 per cent on \$60,000,000 and an agreed annual charge for the amortization of the Manhattan Elevated system at an agreed valuation.

Each surface line or other company taken in to receive an agreed annual payment for return and amortization of its property at an agreed valuation.

In exchange for assurance of return and amortization payments each company to vest title to its property and franchises in the city at the execution of the contract, complete ownership to pass on completion of amortization.

The city's return under Contract No. 3 to be reduced from 8.76 per cent to its actual interest and sinking fund charges, the same as in Contract No. 4.

The accumulated deficits of the city under Contracts No. 3 and No. 4 and of the Manhattan Elevated under the certificates to be canceled. The accumulated deficits of the I.R.T. and N.Y.R.T. to be funded and amortized within a reasonable period of time.

All net revenues of the companies to be pooled and used to pay all company and city charges. All surplus to go into a surplus fund under the control of city and company.

Rapid transit lines of each company to be open free to passengers of other companies to all intersecting points.

Such transfer charges to be made between rapid transit lines and feeder surface and bus lines as determined from time to time.

A fare of 7 cents cash, four rides for 25 cents to be effective on execution of contract by each company.

Fares to be raised or lowered from time to time according to the state of the surplus fund.

Instead of 50-50 division of net profits as heretofore, the total operating cost per car-mile to be allowed in advance each year and after adjustments for unforeseen changes in price and wage levels, the companies' efficiency in keeping operating costs below the allowance to be rewarded about as follows: One-third to surplus fund, one-third to company, one-third to operating personnel.

Provision that future construction and equipment be paid for by the city or company as agreed in each case.

Provision that city bonds may be exchanged for company securities under appropriate conditions.

The Transit Commission to be continued for the regulation of service and practices of the company.

The chairman of the Transit Commission, the City Comptroller and an appointee of the company to constitute a board of control to fix fares, operating allowances, buses and certain other questions, the companies and the city to have the right to request arbitration of disputed questions.

The City Comptroller to organize a transit accounting office to check and supervise cost of service and to assist him in exercising his jurisdiction under the contract.

City and companies to secure enabling legislation for constitutional amendment to prevent amendment of contracts by a statutory body.

The city to have the right to issue bonds and pay the companies the amounts required under recapture provisions of the dual contracts.

The city to have the privilege of carrying all or any part of fixed charges by taxes on the increase in property values due to transit.

The city and the commission to appoint a conference committee to work out amendments to the contracts as outlined above and to negotiate with the companies.

DUAL CONTRACTS NOS. 3 AND 4

Contracts Nos. 3 and 4 with the city, under which the I.R.T. and B.-M.T. subways are operated, were prepared carefully in the city's interest. They attracted a large amount of private capital in 1913 and since at more favorable rates than any other capital has been obtained for public utilities in the United States. The first money invested in the subways built under these contracts earns 6 per cent for the companies and, allowing $\frac{3}{8}$ per cent for amortization during the life of the contract, the net return is $5\frac{3}{8}$ per cent. On money for additions the companies get actual interest plus 1 per cent for amortization until paid for, when the additions belong to the city, thus giving a net of about $5\frac{1}{2}$ per cent. This compares with an average of about 6 per cent on \$400,000,000 in the money invested in transit systems in five other American cities.

The only criticism of the dual contracts worthy of serious consideration relates to the fixed preferentials of the original or then (1913) "existing" railroads, \$6,335,000 per year to the I.R.T. in place of the earnings on the original subway, and \$3,500,000 to the N.Y.R.T. in place of the net earnings on the former Brooklyn elevated and rapid transit lines. These were calculated as the average net earnings of the respective companies for 1910 and 1911. In agreeing to accept the preferentials, the companies gave up prospects of large amounts of money. These earnings were necessary to support the new subways during the development of new traffic.

It is the opinion of Mr. Smith that the rate of return on a fair value of the properties would exceed the returns to which the companies are entitled under Contracts No. 3 and No. 4 and that their property is held under these contracts on a very favorable basis to the public. It seems clear that if the rule of reasonable returns on a fair value be applied to these properties, the financial returns to the companies would be greater than those which are provided in the contracts.

ELEVATED SYSTEMS NOT LOSING TRAFFIC

Contrary to general impressions, business is not leaving the elevated railways in favor of the subways. The rate of increase has not been so fast as that of subway traffic, but it must be remembered that the elevated lines were thought to be saturated when the subways were started. In 1912 the elevated lines carried 304,270,841 passengers, in 1927 they carried 359,019,660 passengers. The elevated system is a going concern. Its service can be improved and its capacity further enlarged by modern, commodious cars. But this cannot be done on a 5-cent fare.

It would take a billion dollars, according to the cost of the new city subways per passenger, to replace the existing elevated lines as passenger carriers based on Board of Transportation traffic estimates for conditions in 1940.

Had the elevated fares per passenger equaled the cost on the I.R.T. subways the net earnings for the last nine years, capitalized at 6 per cent, amount to \$136,821,300 as compared with \$152,536,574 existing bonds and stocks.

SURFACE LINES STILL USEFUL

The surface lines continue to be the neighborhood convenience and necessity. Last year 997,251,460 fares were collected and this slight decrease from the peak of 1924 is not indicative of a permanent falling off. These lines take in about \$50,000,000 and spend about \$40,000,000. There has been an increase of 50 per cent in surface car passengers during the development of the subway traffic.

In 1926 the bureau of valuation of the commission showed the following for the surface lines:

Original cost	\$159,762,000
Reproduction cost	327,428,000
Cost of condition	12,440,000
Depreciation (1926 prices)	114,392,000
The total capital of the companies amounts to	
Bonds	158,532,588
Stocks	85,322,213
Total	\$244,054,801

All the surface line companies protested these commission figures as not including all elements of value. These figures show that at a fare, say 7 cents, four rides for 25 cents, the surface lines would be reasonably self-supporting. Earnings would increase and costs decrease were the lines to modernize.

The ghastliest joke on the street and electric railway industry in America, in which about six billion dollars are invested, is the impression created on the financial interests by the street cars that are operated in lower Broadway through the heart of the financial district. They are old and out of date, noisy, slow to get started and don't run fast when they do, expensive to operate, and subject to frequent failures and push-ins. The electric railway interests could well have afforded to get control of this company, equip it with the best and show what a surface line can do even in congested Manhattan.

In lower Manhattan and on certain narrow streets surface lines could not be operated because of traffic congestion. On wider streets, where there is heavier street car travel, surface lines expedite more people than they delay and carry more people with less use of the streets than any other vehicle. If street cars were abandoned and buses used there would be added the finishing touch to New York's traffic congestion.

The underlying leases that have been criticised for so many years have practically all been lowered or abolished. Receiverships and disintegration have accomplished what the companies found it difficult to accomplish. No leases remain that are subject to honest criticism. Beginning with the receiverships and disintegration of the Metropolitan Street Railways in 1907, the receiverships of the New York Railways and the Brooklyn lines in 1919 and various reorganizations, these leases were wiped out. The sole remaining lease of any importance is the I.R.T. lease of the Manhattan Elevated and this rental has been lowered from 7 to 5 per cent.

MOTOR BUSES UNSUITABLE

Motor buses cannot supersede the street cars in handling all surface traffic without a great increase in cost that may be estimated at \$25,000,000 to \$40,000,000 a year and worse interference with other traffic than street cars. For example, it would take more than five times the Fifth Avenue buses to handle only the Third Avenue street car passengers. At 10 cents the extra cost for this traffic would be \$13,000,000.

For crosstown use in narrow streets where the lines of traffic are frequently diverted and also as feeders to surface and rapid transit lines there is a wide field for buses in New York. But there is no place for them in competition with the surface lines because they cripple the service of the surface lines and ultimately stop them without being able to handle all the traffic as well, nor as economically, nor as speedily. Where they are needed they should be co-ordinated with present lines.

RAPID TRANSIT COMPANY EARNINGS FOR POOLING

For three years the companies have earned more than their charges under Contracts Nos. 3 and 4 as follows:

	I.R.T.	N.Y.R.T.	Total
1925	\$725,230	\$678,239	\$1,403,469
1926	3,078,514	826,336	3,904,850
1927	2,669,895	2,128,282	4,798,177

Had there been no accumulated deficits these amounts would have been paid the city. But they were applied to reduce the companies' deficits, which were as follows June 30, 1927:

I.R.T.	\$2,771,396
N.Y.R.T.	14,192,706

These deficits do not include certain items and claims of the companies. The I.R.T. deficit will probably be wiped out in a few years, but that does not mean the city will receive any rental as the company is behind with depreciation and there is deferred maintenance. The same is true, but in greater measure, of the N.Y.R.T. The net earnings of both companies will be decreased by the competition of the new city subways.

The recapture of the city-owned lines in Contracts Nos. 3 and 4 without the purchase of the remaining lines of each system would present serious problems of disruption of present routes and service or joint operation. The recapture provisions are chiefly of value in definitely fixing the basis on which the city shall pay for the companies' investment in the event of purchase by the city.

If the city recaptures the rapid transit lines it will have to pay the cost of the companies' original contribution to construction and the cost of equipment plus 15 per cent, and lower percentages on additions less 1/39th each year after the tenth year, notwithstanding the companies have already received in large amounts sinking fund installments. Thus the city would pay about 25 per cent more than it is obligated to pay out of fares if the companies continue to operate the lines. The amount the city must pay is decreasing about \$4,000,000 per year, which represents the increase in the city's equity under the dual contracts.

The annual charges received by the companies are definite and run until the end of the contracts, about 1968 or 1969. Assuming 1968 as the end, the companies would receive a total of \$432,000,000. If the city recaptures the lines in 1927 and issues 50-year bonds at 5 per cent and the charges ran for 50 years it would aggregate a cost of \$449,000,000.

In the event of recapture there would be four operating systems instead of three. This would give higher fares in going about the city. There would be discontinuity in the systems, making for difficulty with passengers and controlling bodies. Legal difficulties are also found in any attempt to apply the recapture clauses.

After recapture of city-owned lines of the B.-M.T. and East Side I.R.T. the city would have for subsidized operation lines handling about 700,000,000 passengers a year, 25 per cent of the traffic, carried partly by taxation and tax exemption and partly by fares. The several companies, including the surface lines, would have for self-supporting operation lines handling about 2,100,000,000 passengers a year, 75 per cent of the traffic. They would have great difficulty in giving service in competition with city subsidized subways operating with a fixed 5-cent fare.

Thus, recapture touches but 25 per cent of the transportation problem.

Free Rides Given in El Paso

DETAILS of the chartering of the El Paso Electric Railway for 1 1/2 hours on May 27 last are given in the company's brief filed in connection with the 1927 Coffin Prize. The chartering company was the Popular Dry Goods Company, which, in May of this year, celebrated its 25th year in business by a special sale. In the opinion of the management of this store, there could be no better accompaniment for such an event than to give the public an opportunity to ride free to its store between the hours of 8:15 and 10 a.m. Between these hours the fare box openings on the El Paso cars were closed with wooden plugs and the railway operators courteously informed all passengers that they were riding free, as guests of the Popular Dry Goods Company. At the store tickets were given away, available on the car lines for a return trip up to 7 p.m. of the same day. During the hour and 45 minutes in the morning mentioned two other car lines which usually do not pass this dry goods store were routed by it. The fact that the dry goods company would provide these rides was well advertised by it in advance.

A check of inbound passengers on all lines during these hours was made and found to result in 4,296 adults and 858 half fares. These were billed to the merchant at regular rates. The number carried was about 2,781 above normal during those hours.

Improved Service Builds Business in Chicago

Chicago Surface Lines continues to increase revenue and reduce costs with better cars on smooth track, closer schedule supervision and higher standard of maintenance. Increased revenue and reduced cost are shown in company's Coffin Award brief



Why Street Car Riding Grows

Did you ever stop to consider the significance of the steady increase in street car riding in Chicago?

Do you know why, in spite of the growing number of automobiles, there were 221,000,000 more rides on the Surface Lines last year than in 1922 and 57,000,000 more than in 1923?

The reason becomes apparent upon a moment's consideration.

It is because street car service meets the needs of the people of Chicago better than that of any other transportation agency.

Surface Lines tracks reach all parts of the city. Every business section and every residential community is easily accessible by one or more of the many Surface Lines routes.

And Chicago citizens have learned that they save time and effort by using street cars in going to work or shopping during the day or to the theater in the evening.

There is no substitute for street car service.

CHICAGO SURFACE LINES

Amey A. Quinn
President

Car cards and newspaper ads used by Chicago Surface Lines

At the left are shown ride building ceiling cards used in Chicago cars.

The advertisement in the center is newspaper copy used by the Chicago Surface Lines to tell its story directly and frankly.

As shown at the right, passenger good will is the objective of these brief talks with the rider, carried on ceiling cards in the car.

C T R A C T I O N T O P I C S C

Courteous Service

As a class Surface Lines trainmen are efficient and courteous and we are proud of them.

Passengers can help us maintain the standard of service by reporting any incivility or discourtesy.

C T R A C T I O N T O P I C S C

You Are Entitled to Light

Trainmen have strict orders to use the lights whenever they are needed.

If at any time there is insufficient light, passengers are requested to notify the conductor.

C T R A C T I O N T O P I C S C

COURTESY

Surface Lines trainmen realize that incivility of one of their number reflects upon all of them.

You help the conscientious trainman and contribute to better service when you report incivility.

C T R A C T I O N T O P I C S C

Why Worry About Parking?

Do away with parking worries by going to the theater or movie by street car.

You will make the trip comfortably, safely and quickly and will enjoy the show more.

When You Go to the Movies—

Use the street car and enjoy the show while the other fellow's hunting a place to park.

Go to Church

All of Chicago's beautiful churches can be reached conveniently by street car. Attend services somewhere next Sunday.

HALLOWEEN

Boys: Enjoy Halloween without damaging property or interfering with the comfort of others. Schools, clubs and churches are cooperating to make it a night of wholesome fun.

The Great Outdoors

Beautiful spring awaits you in the parks.

THE SURFACE LINES ARE MOST CONVENIENT

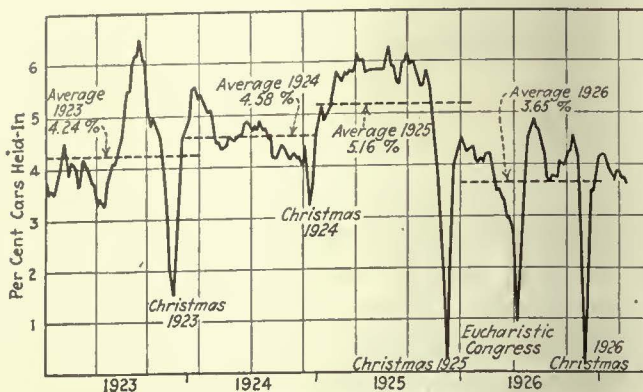
FAILURE of various attempts to reach a franchise settlement have not deterred the Chicago Surface Lines from continuing its program of service improvement, started a number of years ago in the face of the then expiring franchises under which the properties operated. Since February, 1927, operations have been carried on under temporary grants while awaiting permanent settlement. Despite this situation there has been no let-up in the program of providing better, faster and more regular service, a higher standard of maintenance for cars and track, better trained employees—in short, better transportation.

The management has continued to have faith in the power of its demonstration of sincerity ultimately to win an equitable franchise settlement that will be fair both to the community and the company's investors. There is, however, no altruism in this program. It has continued to prove itself good business. Service improvement, on

the one hand, has brought steadily increased revenues, while higher standards of maintenance and greater operating efficiency have resulted in large savings in cost. A policy of rigid insistence on employee efficiency, combined with square dealing, has won the loyalty and support of the largest and most powerful union organization in the industry, which even in the midst of wage negotiations recently went out of its way to defend the Chicago transportation companies against unwarranted attack by other trades unions in the city.

Something of the spirit and point of view that have actuated these companies was outlined in the ELECTRIC RAILWAY JOURNAL of April 26, 1926, page 708. The

Year Ended Jan. 31	Revenue	Passengers	Per Cent Increase
1923	762,629,211		8.16
1924	824,850,103		8.64
1925	830,151,540		1.45
1926	842,201,453		1.45
1927	876,249,663		4.04



Co-operation between the shops and transportation departments permits maximum utilization of equipment during holiday peak season

results which have followed testify vividly to the wisdom of the company's policy as shown in the tabulation on page 819.

Annual gross earnings in five years increased from \$56,103,061 to \$61,173,601, or 9.04 per cent. During 4½ months of the year ended Jan. 31, 1923, with which comparison is made, there was an 8-cent fare in effect, which was subsequently reduced to 7 cents. From 1923 to 1927 private automobiles increased 84 per cent and the operations of an independent bus company were widely extended. Again, while the gross earnings increased 4.06 per cent in 1926, operating costs rose 2.07 per cent, but residue or net receipts were increased 9.41 per cent, thus showing a material increase in efficiency. It is also significant that the average speed maintained on surface cars during 24 hours for the entire system rose from 10.73 m.p.h. in 1921 to 10.92 m.p.h. in 1924 and 11.18 m.p.h. in 1927. Still further light is thrown on the results accomplished by the fact that the number of car-miles operated has increased from 122,161,073 in 1923 to 132,451,712 in 1926, an increase of 8.42 per cent.

Operating ratios, including 8 per cent of gross earnings allotted for renewals and depreciation and exclusive of taxes, show a steady decrease as follows:

Years	Operating Ratio, Per Cent
1924.....	75.17
1925.....	74.11
1926.....	72.70

Without depreciation the 1926 ratio was 64.75 per cent, this being 5.17 per cent lower than the average for 42 principal companies throughout the country.

MODERN CARS PURCHASED FROM RENEWAL FUND

New cars to the number of 445 were added to the system during the last three years. This was done, despite inability to obtain capital because of the franchise situation, by use of the reserves set aside for renewals. All of the 445 units are equipped with pneumatically operated doors. Two hundred and forty-five of the cars have automatic exit doors. Low steps and wide platforms to speed up the movement of passengers are other features of Chicago rolling stock. Fifteen inches is the maximum height for the first step and the platform width permits three persons to board and alight at the same time.

Included in the car program was an articulated unit, built in 1925 from two old double-truck cars. This was an experiment. The costs of construction, coupled with the result of tests, influenced the management against further construction along this line. There has been expended for new car equipment and extensions a total of \$7,848,000.

During the time that this new equipment was being purchased existing cars on the system were overhauled into first-class condition. In 1923 a progressive overhaul and repair schedule was set up. At first the basis of overhaul was three to four years. Beginning with 1925, however, this was changed, so that since that time every

Financial Summary of the Chicago Surface Lines for the Fiscal Years ended Jan. 31, from 1922 to 1927, Shows the Steady Increase in Riding and the Increased Operating Efficiency Resulting from the Management's Progressive Policies

	1927	1926	1925	1924	1923	1922
Passenger revenue.....	\$60,436,705.93	\$58,076,487.22	\$57,284,602.06	\$56,986,687.82	\$55,495,310.69	\$59,706,412.72
Other revenue.....	736,895.27	709,393.51	797,076.14	668,481.91	607,751.24	637,320.47
Gross earnings.....	\$61,173,601.20	\$58,785,880.73	\$58,081,678.20	\$57,655,169.73	\$56,103,061.93	\$60,343,733.19
	7-cent fare	7-cent fare	7-cent fare	7-cent fare	Fare 8-cent to 6-14-24 7-cent thereafter	8-cent fare
Operating Expenses:						
Way and structures.....	\$2,984,484.50	\$2,830,649.58	\$2,859,869.95	\$2,682,066.36	\$2,556,627.18	\$3,040,939.66
Equipment.....	4,188,633.15	3,984,635.24	4,148,282.10	3,858,865.16	3,788,170.59	4,348,372.65
Renewals.....	4,893,888.08	4,702,870.47	4,646,534.24	4,612,413.59	4,488,244.96	4,827,498.67
Power-maintenance.....	386,086.82	394,620.73	376,062.63	361,955.71	316,449.77	320,375.52
Power-operation.....	3,638,283.15	3,465,460.05	3,466,857.30	3,321,683.08	3,175,390.97	3,128,792.32
Conducting transportation—trainmen.....	21,485,750.20	20,741,205.68	20,890,865.98	19,640,721.02	19,662,636.31	21,574,699.34
Conducting transportation—other.....	3,214,031.29	3,172,423.05	3,177,461.10	3,030,582.88	2,912,780.47	3,208,603.47
Traffic.....	123,433.08	109,973.48	102,793.44	44,208.18	42,092.79	34,546.97
General and miscellaneous—damages.....	1,935,202.48	2,469,007.01	2,439,430.49	2,421,517.13	2,356,328.59	2,271,224.06
General and miscellaneous—other.....	1,620,696.77	1,697,361.31	1,551,803.24	1,695,740.04	1,859,348.09	1,568,097.52
Total operating expenses.....	\$44,471,489.52	\$43,568,206.60	\$43,659,960.47	\$41,669,753.15	\$41,158,069.72	\$44,323,150.18
Balance.....	\$16,702,111.68	\$15,217,674.13	\$14,421,717.73	\$15,985,416.58	\$14,944,992.21	\$16,020,563.01
Taxes.....	\$3,400,000.00	\$3,060,000.00	\$2,915,000.00	\$3,170,000.00	\$3,258,000.00	\$2,193,000.00
Residue receipts.....	13,302,111.68	12,157,674.13	11,506,717.73	12,815,416.58	11,686,992.21	13,827,563.01
Operating ratio (excluding taxes), per cent.....	72.70	74.11	75.17	72.27	73.36	73.45
Miles single track operated.....	1,008	1,003	997	993	993	993
Average maximum number cars operated (week days only).....	3,367	3,234	3,209	3,134	2,982	2,982
Revenue passengers carried.....	876,249,663	842,201,463	830,151,540	824,850,103	762,629,211	750,515,622
Transfer passengers carried.....	651,224,394	626,365,104	616,552,684	600,848,554	557,331,999	547,522,102
Free passengers carried.....	47,495,845	48,944,104	46,023,318	41,645,629	38,801,339	35,724,665
Total rides.....	1,574,969,902	1,517,510,661	1,492,727,542	1,467,344,286	1,358,762,549	1,333,762,409
Revenue car-miles operated.....	132,451,712	128,398,420	127,213,599	122,161,073	116,131,909	118,446,044
Revenue car-hours (paid for).....	14,788,514	14,269,909	14,381,497	13,899,147	13,186,984	13,548,089
Passenger revenue per revenue car-mile, cents.....	45.63	45.23	45.03	46.65	47.79	50.41
Passenger revenue per revenue car-hour.....	\$4.09	\$4.07	\$3.98	\$4.10	\$4.21	\$4.41
Operating expenses per revenue car-mile, cents.....	33.58	33.93	34.32	34.11	35.14	37.42
Operating expenses per revenue car-hour.....	\$3.01	\$3.05	\$3.04	\$3.00	\$3.12	\$3.27

car goes through the shops every two years, with the following result:

Year	No. of Cars Overhauled	Average Cost of Overhauling	Miles Operated Per Car Overhauled
1922.....	822	851.93	140,800
1923.....	803	761.14	150,900
1924.....	1,000	832.21	126,820
1925.....	1,467	461.40	87,300
1926.....	1,517	457.97	87,200

These figures forcibly reveal the economy of a high standard of maintenance. It is a short story: Number of cars overhauled almost doubled, cost reduced almost one-half. To this should be added the figures for the routine maintenance costs, which speak for themselves. In 1922 it cost \$3.28 per 1,000 car-miles for equipment maintenance, as compared with \$3.13 in 1926.

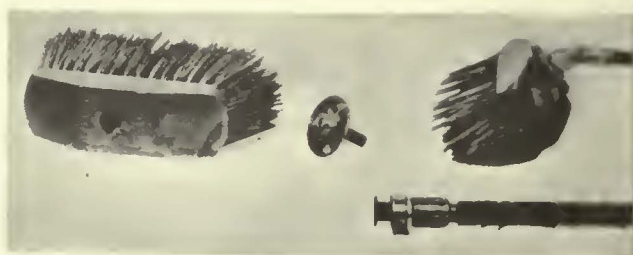
In judging these figures it should be remembered that a wage scale as high as any in effect anywhere in the industry is paid in Chicago. Under this scale repairmen are paid 75 cents per hour, carpenters 64 to 90 cents, machinists \$1 to \$1.05, machinist helpers 70 to 75 cents, shop controllers and car wiremen \$1 and other trades on a comparable level. These high rates, have, however, been offset by increased efficiency, which is partly shown by the following tabulations:

Year	No. of Carhouse Employees	Car-Miles Per Year Per Man	Cars Per Man
1922.....	1,258	91,924	2.54
1926.....	1,325	99,908	2.69

Year	Employees Shop and Equipment Department	Employees Per 100,000 Miles Operated
1922.....	2,238	1.93
1923.....	2,405*	1.98
1924.....	2,484*	1.95
1925.....	2,343*	1.83
1926.....	2,304	1.74

*Men employed solely on new car construction are included.

Included in the general plan of overhauling all cars of the system have been painted, the color scheme being pared set off by cream-colored posts, a decided change for the better from the old standard dark green bodies and cherry posts of the period prior to 1920. In addition to this, the Chicago Surface Lines believes in daily and weekly housecleaning. Every day the cars are swept, floors and interiors are disinfected and curtain moldings and lights are thoroughly cleaned. On the present washing schedule, 4,870 cars are thoroughly washed per week. Since the total number of cars on the system is 3,639, this schedule puts the cars through on an average of more than once per week. Compressed air is used to clean



Fountain brushes are used to wash Chicago cars thoroughly and quickly

heaters, sign boxes and curtains. All interior woodwork, floors and seats are scrubbed.

Pull-ins, which are a serious handicap in providing speedy and reliable service, have been effectively reduced on the Chicago system by intensive work and co-operation between the transportation and equipment departments. In 1926 the car-miles per pull-in were 14,839, compared with 7,100 in 1925. This represents an improvement of 103 per cent in twelve months. To this record may be added the fact that the mileage operated by the system during 1926 averaged 37,445 miles per motor car on the property. Records also show that on Dec. 20 last 100 per cent of the 3,639 cars owned by the company were in operation and that on the three days succeeding there was only one car out of service.

GREATER USE OF EQUIPMENT

It is significant at this juncture to comment on figures for car operation for the three years ended Jan. 31, 1923, as compared with the three years ended Jan. 31, this year. The score stands: Number of cars operated as of Jan. 3, 1923, per 10,000 riders, 7.87, against 7.35 for the period ended Jan. 31, 1927. Despite this reduction of 6.6 per cent in the number of cars per 10,000 riders the percentage of passengers per car in rush hours was decreased 12 per cent by improved scheduling. By re-routing, more scientific scheduling and better maintenance, which all lead toward more efficient use of available equipment, the following estimated savings were made:

Total cars owned (prior to Nov. 1926).....	3,539
Average pay time per rush-hour car, hours.....	8.2
Average cost that varies with car operation per car-hour.....	\$2.50
Effective days in year.....	300
14.6 per cent of 3,539.....	517
Saving per year in operating cost.....	\$3,170,000
Reduced investment at \$20,000 per car, including storage.....	\$10,320,000
Reduced interest on investment.....	\$516,000
Total reduction in operating expenses and interest charges.....	\$3,686,000



Clean cars are considered an important element in building a satisfied patronage for the Chicago Surface Lines. The 3,639 cars on the property are thoroughly washed more than once a week



Special clips made in the company's shops are used to support two ceiling cards in each car

The 14.6 per cent is arrived at on the basis that to have provided the present service under the old conditions would have required 12 per cent more cars in each direction, which would be 8 per cent of all the cars operated. Further, since all cars owned were in use, an increase of 8 per cent in rush-hour equipment would have necessitated the purchase of that percentage of new rolling stock.

TRAFFIC CHECKS SPEED SERVICE

While only 12 per cent of all rides on the system are taken within the business district, the relief from congestion in this area due to special traffic studies has had a marked effect on the system as a whole. A 10 to 30 per cent reduction in traffic obstructions was accomplished by rerouting and by the consequent elimination of 11,000 car turns per day in the Loop district. At the same time the results accomplished led the city to prohibit left-hand turns by all vehicles in the business district. A 14 per cent increase in service, an 8.42 per cent rise in revenue car-miles and a 10 per cent rise in seat-miles are some of the results. These figures when translated amount to an increase in car-miles from 122,161,073 in 1923 to 132,451,712 as of 1926, and seat-miles increased from 5,339,660,501 to 5,875,557,944. The latter is due in some respects to new cars having 52 seats each.

Success obtained by the company in improving traffic conditions in the Loop area led to co-operation by the city

SCHEDULE NUMBER OF CARS CROSSING VARIOUS HEAVY INTERSECTIONS DURING THE MAXIMUM ONE-HALF HOUR IN CHICAGO

	Cars Pass
Grand, Halsted and Milwaukee Streets.....	269
Madison and Clark Streets.....	197
Halsted and Archer Streets.....	153
Clark and Lake Streets.....	145
State and Lake Streets.....	137
Clark and Division Streets.....	169

NUMBER OF CARS ONE WAY PER MAXIMUM ONE-HALF HOUR VARIOUS KEY LOCATIONS IN CHICAGO

Milwaukee Avenue, southbound, Elston Avenue to Desplains Street ..	100
Clark Street, southbound, Diversey Parkway to Division Street.....	86
Clark Street, southbound, Center Street to Wells Street.....	125
Wabash Avenue, southbound, Randolph Street to Harrison Street.....	96

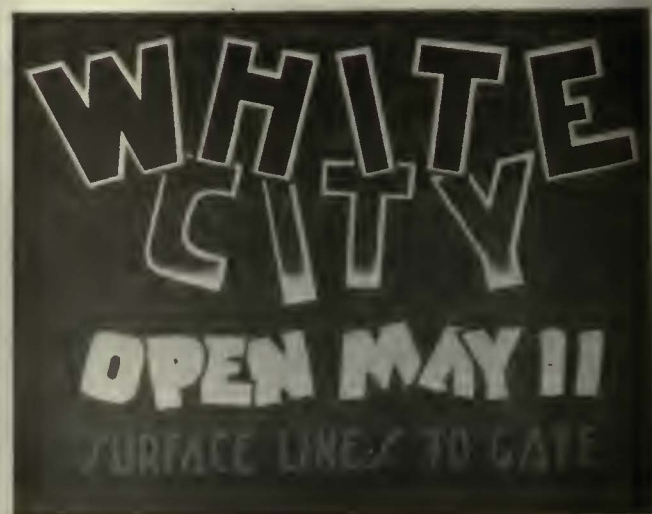
RESPONSE IN RIDERS

Year Ended	Weekday Average	Saturday Average	Sunday* Average	Total for Year
Jan. 31, 1923.....	2,204,425	2,356,385	1,563,911	762,629,211
Jan. 31, 1924.....	2,354,139	2,521,487	1,623,414	824,850,103
Jan. 31, 1925.....	2,373,114	2,512,121	1,614,823	830,151,540
Jan. 31, 1926.....	2,424,194	2,507,004	1,631,484	842,201,453
Jan. 31, 1927.....	2,521,897	2,668,342	1,632,844	876,249,663

*Includes holidays.

in the initiation of similar studies over the systems. The schedule and traffic department was increased from eleven to 40 highly trained men. New forms were drafted and closer co-operation maintained between trainmen, supervisors and civic bodies. Special checks are made by conductors to supplement the records of the schedule force. Specialists analyze terminal conditions and traffic interferences. These agent reports are compiled for office use and when combined with analyses of the operating and supervisory practices of the transportation department form the basis for revisions in running time. Schedule checkers follow up the company's operations by checking variables in running time, headway and terminal time. This work develops detailed data for transportation and supervisory forces. On certain heavy lines, where headways are close, increased service is provided by two-car trains of the multiple-unit type, operated on a carefully balanced schedule during the rush hours.

A concrete example of what has been accomplished by keeping service carefully balanced to the needs of a given line is furnished by the history of a crosstown line located on the south side. Five years ago nine two-man cars were operated on this line and the yearly revenue passengers stood at 1,939,722. It was decided that better service could be given by one-man operation (there are



Types of posters used in the ends of Chicago cars to stimulate riding

one-man cars on the system, the number being restricted by state authority). Twelve cars of this type were subsequently placed in service. This reduced the headway and inversely increased the riding. Schedules were revised. More cars were added. With twenty one-man cars operating during the week from Feb. 8 to 14, 1925, 13,743 passengers were carried compared with 99,113 patrons per week transported by the nine original two-man units in service prior to April 1, 1923. Growth of population and business made it expedient to change back to two-man operation. The line was extended 1 mile last year into an undeveloped area. The net results stand at this writing: 6,766,840 revenue passengers per year, which is a 249 per cent increase over the fiscal year ended Jan. 31, 1922; average of 22 cars and 1,171,798 car-miles operated per year, representing an increase of 9 per cent.

TRAFFIC PROBLEM SEVERE

The staggering traffic problem confronting the Chicago Surface Lines may be appreciated when it is known that normally between 7 a.m. and 7 p.m. there are 570,000 rides per day into and out of the business districts provided by 17,000 cars. This represents 57.8 per cent of all passengers using surface vehicles in the area. Fifteen thousand vehicles enter or leave the business area (about 7/8 of a square mile) during the peak half hour, and 1,136 street cars must cross the district boundaries during the same period. Despite a constant increase in private vehicular traffic, the results obtained in speeding up the three main traffic arteries through the congested Loop district are indicated by the following figures:

	1924 M.P.H.	1926 M.P.H.	Increase Per Cent
Wabash Avenue.....	4.32	6.17	42.8
State Street.....	3.66	6.10	66.7
Clark Street.....	4.88	6.65	36.3

While analysis and revision of schedules have been largely responsible for these speed figures, there is another important factor to be mentioned, i.e., traffic direction by an expert force of company men who in the central district assist the police in moving traffic during the rush hours. These men are dressed in uniforms closely resembling those of the police. Augmenting this traffic control there is a liaison between the company traffic officers and dispatchers at the central offices which is maintained by street telephones. Further improvement in service was brought about by the company's anti-parking campaign and the subsequent regulation by the City Council, which revealed, incidentally, that automobiles had increased from 12,000 in 1910 to 341,000 in 1925. This increase brought 122,726 trips of vehicles to the central business district during a normal business day. The district is capable of accommodating only 157 parked vehicles at a time and there is parking room during a twelve-hour day for only 18,222 vehicles. A survey conducted by employees of various retail business concerns among 96,082 of their patrons showed that 1505, or 1.57 per cent, came in automobiles, which were parked at the curb.

As the result of sifting out the other causes of delays, parades and other pageants were ruled off certain busy streets, through the co-operation of the civic authorities. Front-end collectors, who are stationed at heavy transfer points during the peak loads, and the skip-stop system, authorized in 1918, are other contributions to speedy service.

Detroit Street Traffic Survey

Report reveals that city is less than 50 per cent efficient in the use of its streets. Only 19.1 per cent travel by private auto

DETROIT'S annual economic loss, due to traffic congestion and delay, is estimated as more than \$30,000,000. Detroit, in common with all large American cities, is less than 50 per cent efficient in the use of its streets. The recognition of the need for reducing traffic hazards and the economic losses due to traffic congestion and the possibility of making more efficient use of the highways prompted the city, through the Department of Police, to make a traffic survey.

The survey, which deals principally with private automobile traffic, contains some interesting information about general vehicular travel. A table listing the mode of transportation used by customers of 27 Detroit stores over a three-day period reveals that only 19.1 per cent use private autos, while 80.9 per cent resort to the street car and motor bus. Data on private auto traffic, the 19.1 per cent, comprise the bulk of the report.

The work includes alley traffic, street parking, garage and lot parking and business district traffic flow surveys, in addition to a study of economical vehicular speed.

The division on alley parking points out many unfavorable conditions, such as absence of street numbers, parking of private automobiles, storing rubbish or construction material in alleys and obstructive truck parking.

It was shown in the section covering street parking that many violations of parking regulations were being made.

INCREASING VEHICULAR SPEED

Under the subject of "Economical Vehicular Speed" appear data on the use of automatic traffic signals and suggestions for increasing vehicular speed. The report further states: "We believe that 'rush-hour' traffic should be given special preference by keeping open for moving vehicles the full width of pavement in the direction of the greatest traffic movement. Slow-moving vehicles obstruct traffic, diminish the number of vehicles that can pass a given point in a given time and increase the amount of passing of one vehicle by another, thus adding to confusion and danger. Certain vehicles, such as heavy trucks, which inherently proceed at slow speed, are required to travel close to the curb. This requirement is fairly well observed, but fails to solve the problem of interference with free movement caused by the presence of other slow-moving vehicles.

"Street cars using the natural highest speed lane and operating on a local stop service become slow-speed vehicles and, in view of the ordinance requiring other vehicles to stop with them, have a very definite retarding action on all other vehicular movements."

It was suggested that the system of operating street cars express and buses local be given a 30-day trial on some route. It is believed by the Commissioner of Safety that such a combined service would expedite materially the flow of all types of vehicular traffic on any street where trolley cars are operated.

Diagrams showing traffic movements in the downtown district were prepared for the traffic flow survey. It is the plan to use the chart in planning platoon type signals.

The intent of the report was to point out certain con-

ditions that exist and to suggest that those interested in a more efficient use of streets and alleys lend their assistance to that end.

The suggestions at the end of the report for bettering conditions included: Further modernization of the traffic signal system, publication of information on use of signals and streets, passing further ordinances and enforcing the present ones with respect to use of alleys and streets, prohibiting improper parking and giving the combination express-trolley car and local-bus service a trial.

In the foregoing suggestions, stress was laid on co-operative endeavor because "in the final analysis," according to the report, "regulatory statutes must depend on public support to produce quick and lasting results."

Washing Frames at Edinburgh and London

They are provided with inwardly swinging horizontal pipes so as to fit any type of car or bus. Other devices feature their design

WASHING frames for buses and cars are much more common in Europe than in the United States, despite the lower cost of labor abroad. A large railway or bus system in Europe without one or more of these washing frames is a rarity. The London General Omnibus Company has 44 garages and at least a number of them are fitted with two or three washing frames. Hence the principal interest in European washing machines is not so much in their use as in their design.

One of the accompanying illustrations shows the form used by the Edinburgh Corporation Tramways and forms part of the report at the Cleveland convention of the Engineering Association committee on motor bus garage design. A feature of this washing frame is the use of two hinged horizontal spray pipes on each side connected to the main water supply by flexible hose. These hinged spraying pipes can be swung inwardly toward the car or bus while in action, thus bringing the spray close to the sides of the vehicle. This permits the frame to be used with a great variety of equipment.

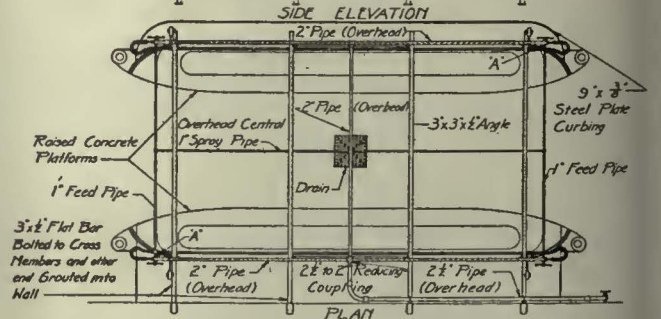
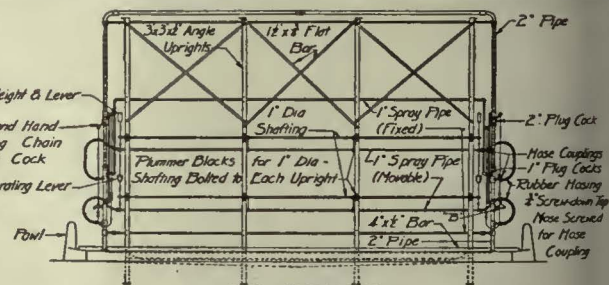
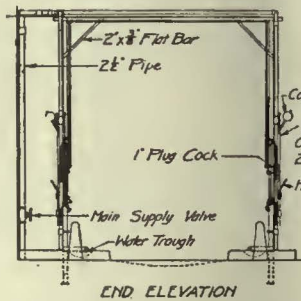
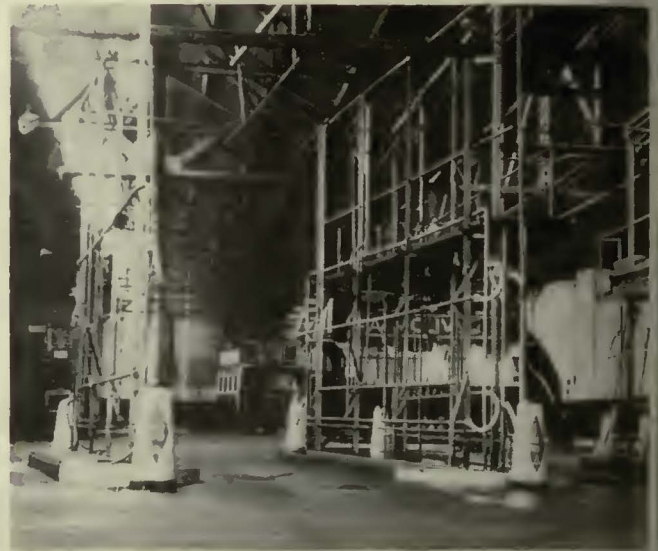
In this respect the frame is similar to the standard of the London General Omnibus Company, shown in an accompanying illustration. In both the lever arm is counterbalanced by weights, so that it is easy for the operator to set the swinging pipes at any position desired. In its use of swinging pipes the machine differs from that used for buses in Berlin and described in the issue of this paper for Sept. 3. In the Berlin example each side of the washing frame is separate and mounted on wheels. By this construction the two frames can be set at any distance apart desired and in any position. An account of still another type, that used by the Paris Surface Lines, was published on page 272 of the issue of this paper for Aug. 13, last.

The Edinburgh washing rack, to quote from the report of the committee on motor bus garage design, covers

approximately 495 sq.ft. of floor space. The extreme outside length is 29 ft. and the width between inside of island curbs is 7 ft. 9 in. These islands serve as the foundation for the frame of the machine. Rounded at the ends, they contain a trough 18 in. wide by 6 in. deep, which extends the whole length of each island.

Three men are required to operate this machine, one at either side, to manipulate the spray handles, and the third at the front end, to wash the bonnet and front part of the body. The time occupied in washing a bus is four minutes, as compared with twenty minutes under the old method, and the quantity of water used per bus has been reduced from 150 gal. to 100 gal. The water pressure is approximately 100 lb. per square inch.

The London washing frame is for a double-deck bus,



British washing racks with inwardly swinging horizontal spray pipes so as to fit any width of vehicle. The line drawing is of a rack used by the Edinburgh Corporation Tramways, the half-tone engraving of one used by the London General Omnibus Company

and there is a platform near the top on which the man who washes the roof stands, using a soft brush. The ends are protected by heavy concrete ports so that accidental sidwiping or other blows from buses will not injure the piping. The water pressure used in London is from 60 to 70 lb. per square inch.

Saving with One-Man Cars in Scranton

With completion of fifteen cars now being converted the Scranton Railway will be 100 per cent one-man equipped, with a marked reduction in operating cost

By C. G. KEEN

Railway Engineer General Engineering & Management Corporation, New York

WHEN the General Engineering & Management Corporation actively entered the street railway field early in 1925 there were numerous problems to solve, many of which have a general interest. Of major importance was the Scranton Railway, and as it was the largest property in the railway group acquired it deservedly received a large share of attention. An extensive track rebuilding program was at once inaugurated and studies were undertaken to effect savings in operating costs.

This company operated at that time about 100 passenger cars in normal daily service, over 103 miles of track, serving the city of Scranton and running to Moosic on the southwest and to Carbondale and Forest City on the northeast and including about 10 miles of track rented from the Scranton, Dunmore & Moosic Lake Railroad to Moosic Lake on the east. The entire system was run with two men per car. This seemed to be the logical place to make economies. A large part of the car equipment was obsolete, and while some cars were with rebuilding, it was decided to purchase at once ten new light-weight, double-truck, double-end, one-man, one-man cars. A careful review of the existing equipment was made and 35 cars were selected to be rebuilt and to be furnished with safety control at once.

The new cars were carefully designed, with no thought except the comfort of the passenger and safe and economical operation. These cars were described in *ELECTRIC RAILWAY JOURNAL* of Aug. 14, 1926.

Rehabilitation of the 35 old cars in 1925 was the first step of a general plan to furnish the entire system with cars that could be operated by one man with safety so as to obtain the resultant savings. The preliminary study showed about \$3,000 per year per car reduction in platform labor cost by one-man operation, assuming 52,000 car-miles run. The cost of the change would be about \$500 per car. The work of conversion was pushed vigorously and the cars were soon on the road with full safety devices and pneumatic door engine control. Line switches were installed and general repairs made.

The savings were at once apparent and the platform costs were reduced approximately as estimated. However, because of the installation of traffic signals in the central city, the schedule speeds were slowed down and the full savings were not realized. Nevertheless the program was prosecuted with vigor and in 1926 twelve more new cars were purchased. These were identical with those bought in 1925 and were described in *ELECTRIC RAILWAY JOURNAL* of Jan. 29, 1927. Twenty more cars were rebuilt. A brief account of the changes on ten of these appeared in the *JOURNAL* of Dec. 18, 1926.

With 22 new cars and 55 others converted to safety cars the average platform expense on the entire system was cut nearly 5 cents per car-mile, amounting in all to about \$30,000 per year. As the total cost of new cars and rebuilding of the old ones was about \$503,000, a good

return was shown on the investment. In the face of generally unsatisfactory business conditions, particularly in and around Scranton, this is a very satisfactory showing and is highly important.

At present fifteen cars are going through the shops, the changes on five costing \$1,500 each and on ten costing \$3,500 each. The cars in the latter class need considerable overhauling, but the greatest cause of the difference in cost is elimination of multiple-unit control and the substitution of hand controllers. This latter change was decided upon because of the expense of maintaining the multiple control with no corresponding benefit, as there are no cars now operated in trains in Scranton.

With the completion of these fifteen cars the city of Scranton will be 100 per cent one-man operated. This, in view of the traffic density, is remarkable and was not thought possible by many who had studied the situation previously.

The safety features of these cars are the standard adopted for all cars operated under the management of the General Engineering & Management Corporation. They permit the greatest flexibility of operation. C. A. Brooks, manager of railways for the General Engineering & Management Corporation, has been the prime mover in all of this work and has devoted a large part of his time to obtaining the economies mentioned. H. H. Dartt, vice-president and general manager of the Scranton Railway, is in direct charge of the construction and operation of this equipment.

Freight Accounting for 25 Depots Centralized

CENTRALIZED station accounting, by a systematized plan devised and installed by C. R. Mahan, comptroller Chicago, North Shore & Milwaukee Railroad, is reported by that company to be in successful operation at the present time in the office of the auditor of freight accounts at Highland Park, Ill.

The accounting activities for the 25 freight and merchandise dispatch deposits located on the North Shore Line are now cared for by the auditor of freight accounts and a staff of 22 employees at the Highland Park office. Approximately 50,000 waybills are handled through this office each month. The use of Powers accounting machines in the compilation of station accounts has proved particularly advantageous.

According to Mr. Mahan, author of the system, the principal advantages of the centralized station accounting plan are as follows:

Station freight accounting is completely divorced from the station and consolidated in a centralized department under the jurisdiction and supervision of the auditor of freight accounts.

The station agent is relieved of considerable detail work, thereby permitting him to give more time to the solicitation of business. The new system also eliminates the factor of accounting experience when selecting new agents or other freight station employees.

It provides a more adequate accounting control over the station accounts and reduces the work of a traveling auditor approximately 65 per cent. By use of the accounting machines in handling this work the number of employees usually required is reduced, as also is the possibility of error due to the human element. In addition the machines speed up accounting work and minimize the labor cost of securing freight statistics.

Public Serviceville, Louisiana
Has a Population of Twenty Thousand

It is the headquarters of the New Orleans Public Service Inc. in Louisiana. The headquarters of the New Orleans Public Service Inc. is located in the city of New Orleans, Louisiana. The company is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America.

Around The World Fifty Times Without a Breakdown!

A record of 50 complete revolutions was achieved by the New Orleans Public Service Inc. when on a special train of 100,000 miles (January 1917) it made 50 complete revolutions around the globe. The train was made up of the finest material and was under the most expert supervision. It is a record that will stand for all time.

New Orleans Public Service Inc.

Methuselah Could Ride a Lifetime in Perfect Safety

The New Orleans Public Service Inc. has established a record of handling 10,000,000 streetcar passengers in each one year of its existence. This is the highest safety record in the history of the industry.

New Orleans Public Service Inc.

The Safest Place on The Streets

—More than twenty thousand people were killed in 1917 on the streets and highways of this country by leaving vehicles.

—The streets are the most dangerous places in the world. It is a fact that is well known to all.

New Orleans Public Service Inc.

New Orleans Public Service Company Believes in Advertising

Advertising is the lifeblood of any business. It is the only way to reach the public and to build up a reputation. The New Orleans Public Service Company believes in advertising and has spent a large amount of money on it.

New Orleans Public Service Inc.

A New Service Helping To Build a Greater New Orleans

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is helping to build a greater New Orleans by providing a safe and efficient mode of transportation.

New Orleans Public Service Inc.

New Orleans Public Service Inc.

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is providing a safe and efficient mode of transportation for the people of New Orleans.

New Orleans Public Service Inc.

Winning Friends For New Orleans

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is winning friends for New Orleans by providing a safe and efficient mode of transportation.

New Orleans Public Service Inc.

A Forest is Under the Track

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is building a forest under the track to provide a safe and efficient mode of transportation.

New Orleans Public Service Inc.

New Orleans Public Service Inc.

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is providing a safe and efficient mode of transportation for the people of New Orleans.

New Orleans Public Service Inc.

Here is a skillful series of newspaper advertisements designed to plumb the civic minds.

These ads also tell a consecutive story of mass transportation and public service.

Transportation Builds School Houses and Homes

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is building school houses and homes for the people of New Orleans.

New Orleans Public Service Inc.

A City is Judged by the Appearance of its Street Cars

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is improving the appearance of its street cars to make them more attractive and efficient.

New Orleans Public Service Inc.

Lost in Traffic Congestion \$1,500,000,000

The New Orleans Public Service Inc. is a public utility and is one of the largest in the world. It is a member of the Public Service Company of America. The company is helping to reduce traffic congestion and save money for the people of New Orleans.

New Orleans Public Service Inc.

Public's State of Mind Controls Car Advertising

By J. C. Barnes

Director of Advertising New Orleans Public Service, Inc., New Orleans, La.

WITH any advertisement, or series of advertisements, concerning the operation of a public utility the character of the copy necessarily must be determined from the state of mind of the community toward the utility rendering the service. This is so even in merchandising copy. What is the feeling of the community toward the utility? Is there a just appreciation of the problems involved in the service? Or is the consciousness toward the utility merely dormant, the service being taken for granted? Or, again, is the feeling toward the utility one of open hostility? These are factors which must determine the character of the copy used in a series of institutional advertisements. Thus considerations were carefully analyzed in the preparation of this series of eleven advertisements which the New Orleans Public Service, Inc., is now running in the daily press. We had no hesitancy in departing from the beaten path of advertising rules in order to meet what we considered the needs of our local situation.

This series, as it obviously will be seen, was designed primarily to awaken a street railway consciousness in the city; to cause the public to appreciate more fully the difficulties that have to be surmounted in order to render dependable street railway service; to bring about a clear appreciation of the value of such service in the growth and development of the community. Only indirectly was there any strictly sales appeal made.

The first of the series shows the magnitude of the company serving the city with gas, electricity and a street railway. However, instead of presenting this in the form of dry statistics, we introduced the idea of a new city, Public Serviceville, La. In a state where there are comparatively few cities with a population of 20,000, the designation of a city hitherto unknown and having such a large population we felt would at once arrest attention. We have shown in this advertisement the number of employees and the amount received by these employees in salaries and pensions. But the keynote of the advertisement, the message we were striving to get over, is embodied in the paragraph, "This great Public Service family of 20,000, almost 5 per cent of the total population of the city, is united, not by bonds of kinship, but by ideals of public service, and these ideals are to give to the city of New Orleans, at all times, the highest degree of gas, street railway and electric service that it is possible to render."

Succeeding advertisements deal strictly with the street railway operation, the most important feature of which we considered dependability. We presented this first in

the copy captioned, "Around the World 50 Times Without a Breakdown," and were able to show in a rather startling manner the remarkable record that our company has been able to achieve in the dependability of the service. Here we make only a casual reference to the fact that the average fare paid by street car passengers in this city is considerably less than elsewhere. And it is made not so much to encourage riding the street cars as to emphasize the importance of the record for efficiency in operation.

We considered, after dependability, the next most important factor, safety, though mindful that many critics would reverse the order, and again we were able to present the record of our company in a somewhat dramatic fashion. Methuselah, a Biblical character known to practically every individual, is shown signaling a street car. There can be little doubt that the unusual contrast of this ancient figure on a modern street would arrest attention, and it was thought that the caption would arouse sufficient curiosity to inveigle one into reading the entire story. Again, in this advertisement we have studiously avoided presenting mere dry statistics.

The advertisement which followed, captioned "The Safest Place on the Streets," tells substantially the same story as the previous copy, with the exception that it shows the difficulty of handling congestion out on the streets, and while applicable to probably every city it was conceived largely with the local situation in view.

At the time the series was prepared there was nationwide discussion on the place of the bus in urban transportation. Copy in the advertisement, with the head "A New Service," was designed, first, to show our conception of the relationship that the bus should occupy in the transportation facilities as a whole, and, further, to apprise the community of the number and type of buses that our company has in service, which facts had not been presented adequately hitherto.

"Winning Friends for New Orleans," the next piece of copy, is strictly of the good-will type. Our company has always prided itself upon the courtesy of its car men, but we realize that local citizens think of this service as valuable only to the citizens of New Orleans. We have presented in the text another angle, which it was felt should cause a better appreciation of the value to the community of the courtesy of our car men.

While in the text of "A Forest Is Under the Track" we have had to deal to a large extent with figures, we believe that they have been handled in such a way as to be readable. This copy was written with the sole

idea of presenting the great difficulties encountered in operating a mass system of transportation on the congested streets of a great metropolis.

Analysis of the next public talk, "Transportation Builds School Houses and Homes," reveals that we have presented a value of street railway service, realized by all street railway operators and perhaps individuals actually engaged in the real estate business, but not generally appreciated by the average individual. The copy shows, too, the amount paid in taxes, without making any reference to the fact that a municipally owned utility pays no taxes, as it was thought that any direct reference to this fact might arouse a suspicion of some political issue in the offing, and thus tend to destroy the good-will value of this statement.

Little explanation is needed in regard to the text of "The City Is Judged by the Appearance of Its Street Cars." This company has always prided itself on the appearance of its street cars, but, of course, there being no local basis for contrast, the appearance of the street cars was taken as a matter of course. It was to awaken a realization of the influence that well-kept cars have on visitors, as well as the value of attractive street cars as they affect the general appearance of the city, that this copy was prepared. It should be noted that in practically all of these advertisements we reiterate our excellent records in safety and dependability.

"You Don't Deliver Your Own Mail" is perhaps nearer directly sales copy than any other advertisement carried in the series. It was written, however, first to reveal the high percentage of individuals who use street cars as contrasted with other means of travel, and, next, to awaken a consciousness of a mass system of transportation, just as the electric system is a mass system of power, and should be so considered.

The purpose of the last of the series, which is headed "Lost in Traffic Congestion \$1,500,000,000," was to apprise the community of the seriousness of traffic congestion, with the certainty that whatever should be done to relieve such congestion the street cars would be shown preference, and that whatever limitation was imposed upon the parking of automotive vehicles in the business section of the city would necessarily operate to the advantage of the street railway.

Allentown Has a Trolley "Greeter"

**Employee of the Lehigh Valley Transit Company
directs incoming railroad passengers to the
proper cars for various destinations**

HAVE you a "greeter" in your home town? Allentown has. Edward Greenawald, employed for 23 years by the Lehigh Valley Transit Company, has been given the position to welcome strangers at the two railroad stations in the town. Travelers, heretofore ignorant of the routes and destination names on the street car fronts, have been jumping in the taxicabs as the easiest thing to do. Now they ask the kind and courteous man standing there with the blue uniform and white cap which car they shall take. Thousands of dollars, the result of investigation, have been added to the coffers of the transit company since this new system has been in effect. E. C. Spring, general superintendent, said

that he was skeptical at the beginning and thought that nothing short of a crew of guides could ever get people into the cars.

On his way back to the station from the offices of the company, the inquiring reporter asked Mr. Greenawald a few questions:

"What time do you start, and what are your hours?"

"I get here at 7:30 in the morning," he replied. "I meet all the principal trains on both roads. As the passengers debark, I call to their attention that such and such a car is waiting outside. It is also my duty to learn if any trains are late; when I do, I hold the trolley at the station so that no one has to wait for his car. People appreciate this service very much."

"How has the taxi trade been recently?" was another question.

"Taxis are not carrying the passengers they used to.



Edward Greenawald, Allentown "greeter," assisting street car passengers

The taxi station over there," he pointed to the plaza where the cabs parked, "used to be filled. Now you see only two or three."

AIDS AS TRAFFIC OFFICER

Mr. Greenawald's job, however, is not only this. As representative of the transit company, he assists in keeping schedules by directing trolleys across the railroad tracks. There is always a halt to permit the conductor to cross the tracks and signal his motorman to proceed safely. With the inspector there, he gives the signal and many seconds are saved.

He must be an information bureau as well. Very often people want to know how to get to a small, nearby country town; how to get to a certain street number; ask where Larry "Whatsisname" is living; what time does the Bethlehem car pass; when will the Muhlenberg car reach Sixteenth and Hamilton Streets, and hundreds of other questions. Not only must he know Allentown's streets, buildings and people, he must be able to digest railroad time-tables and reel them off in a wink. He must help ladies on the trolleys. He must call off the names of the trolley destinations as the trains come in. He must smile at the little ones, and at the big ones, too. He must be on duty in fair weather and foul. He must hold cars for late trains. He must direct them across the railroads. He must be a human encyclopedia of everything that pertains to or is part of the Lehigh Valley Transit Company, with its many routes and its wide-flung system.

Maintenance Methods *and* Devices

Small Impregnating Tanks Favored

SMALL impregnating tanks are used by the London County Council Tramways, London, England, to supplement the one large impregnating tank with which its shop is equipped. The management, which is an extensive user of impregnation in motor repairs, believes this plan is preferable to the use of a few large tanks. There are fifteen small tanks, each of which will hold an armature. They are served by an overhead crane. It is the practice to leave an armature in one of these tanks for about six hours.



London County Council Tramways has fifteen impregnating tanks, each of which will hold an armature

Railroad Crossing Derail for One-Man Cars

FIVE railroads are crossed at grade by the tracks of the Cleburne interurban division of the Northern Texas Traction Company, Fort Worth, Tex. At the time the interurban line was built the owners agreed to maintain derail switches on both sides of each railroad crossing, these derails to be kept open except when interurban cars were actually crossing the track.

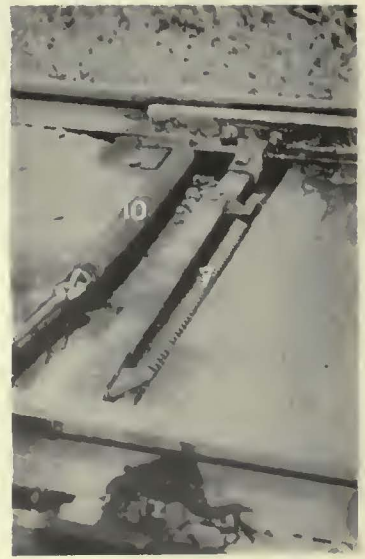
An arrangement of ordinary hand-operated derail switches served very well as long as the cars were operated by two men, but when one-man operation was begun the problem of operating the derail switches immedi-

ately presented itself. Full automatic operation, the company says in its 1927 Coffin brief, did not seem to be satisfactory as it did not require the operator to get out of his car and look up and down the track for an approaching train. Finally the company decided to use a derail which it developed itself. It consists of an ordinary hand-operated derail switch with an electric trip to open the derail after the car has passed. The details of the switch follow:

When the interurban car is approaching the railroad crossing the

switch point is open, as shown in the first illustration. Therefore, the operator has to bring his car to a full stop, get out and throw the switch lever so as to line up the switch point. Reference will now be made to the second view. When the switch point is lined up properly, a roller, 8, underneath latch 6 engages in a notch in plate 3 by the tension of spring 1. Plate 3 is bolted to the switch throw-rod. Latch 6 is pivoted at the point 2.

The car then proceeds to the contactor, which is mounted on the trolley wire 80 ft. beyond the switch



Northern Texas Traction develops derail for railroad crossings for use with one-man cars

point, as shown at 9 in the first view. On reaching the contactor, the trolley wheel or slide on the car completes a circuit through the magnet coil 5 in the second view. The plunger, 4, in this coil then trips latch 6. The switch point then comes to an open position through the action of spring 10 in the third view.

Cars coming through the switch point in the opposite direction cannot latch or keep the point lined up after passing it for two reasons: The first is that when the manually operated switch stand returns to the open position the handle automatically drops into a slot. The second reason is that as the car comes through the point, spring 7 acts in the ordinary way to return the point to the open position. The slot in the usual semaphore switch stand that holds the operating handle in closed position is filled up.

There are two of these equipments at each railway crossing and the company has had ten in service for some time with very satisfactory results.

Bearing and Gear Case

Maintenance in Birmingham

SEVERAL ingenious maintenance methods of the Birmingham Electric Company are given in the 1927 Coffin Prize brief submitted by that company. Some of these have already been described in the Maintenance Data pages of other issues. Brief notes of some others follow:

Bronze bearings are now used for armature and axle bearings and are tinned by a rather novel device. After the bearings are heated in the gas furnace they are placed in a jig while hot, the tinning being applied by spinning the bearing around. This assures a smooth finish and even application of the tin to the interior surface of the bearing.

In the renewal of axle bearings it was quite frequently found that the axles were worn, and as it was customary to carry in stock bearings bored for a standard axle, they would not fit the worn axle. To overcome this trouble, axle bearings are only finished on the outside and rough-bored on the inside. A specially designed chuck was provided, so that now axle bearings are fitted to the individual axle to which they are applied. This has increased the life of the axle bearings 15 per cent and greatly reduced the noise of the car.

To overcome trouble in keeping gear cases on G.E.-57 and 67 motors tight, a 2½-in. x ⅝-in. wrought-iron

Loose armature "bands" render discordant music. Keep them keyed up tight and in tune.

strap was welded to the top of the gear case and the motor frame. This converted the type of support to a three-point suspension instead of two. This has reduced the maintenance of the gear cases on these types of motor by at least 50 per cent.

Much of the yarn waste used in carhouses for car journal packing is now reclaimed. The oiled waste is first heated to a temperature close to boiling, the mass being stirred meanwhile to remove all dirt. The reclaimed waste is stored in metal containers and the oil is piped to underground tanks. This practice has reduced the oil cost one-half and the waste annual consumption from 14,000 lb. to 5,000 lb.

New Equipment Available

Improvements in Splice and Dead End

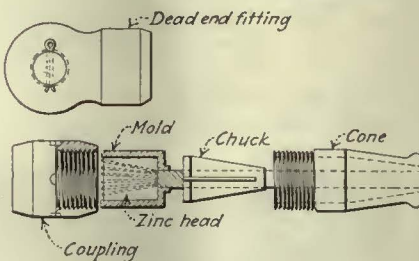
STRENGTH and ease of attaching are claimed for a new cable splice and dead end recently introduced by the Ohio Brass Company, Mansfield, Ohio. The cable splice consists of two cones and two chucks connected by a coupling, one threaded right

slipped over the cable, the ends of the strands are spread and cleaned with emery cloth and tinned by dipping into molten zinc, with a flux of pure sal ammoniac. A mold is then clamped to the end of the cable and a zinc head is made which holds the ends of the strands and makes a positive electrical contact.

The device is made of high-strength, smoke-resisting bronze; it is more easily and quickly assembled because of fewer parts and because wrench surface on the cones and on the coupling is provided. Both the dead end and the splice are made in sizes to fit all cables from ½ in. to 1 in. diameter.



New cable splice



New dead end device

hand, the other left, with space provided for tightening with a spanner wrench.

The dead end is made up of a cone and a chuck with a clevis for connecting to dead end insulators. A zinc head molded on the end of the cable bears against the chuck and the strain on the cable pulls the chuck into the cone, compressing it on the cable and holding it in place firmly. The gripping action of the chuck increases with the tension. All strands of the cable bear their proportionate share of the load, because after the cone and the chuck are

Combination Universal Saw and 8-In. Jointer

BY COMBINING a motor-on-arbor saw with an 8-in. jointer the Gallmeyer & Livingston Company, Grand Rapids, Mich., is offering a combination tool to the trade. Important construction and operating features of both machines are maintained. There is nothing to lock or unlock when changing from operating one machine to the other. When used as a jointer the saw is dropped to its lowest position and the slip coupling is moved to engage the coupling on the jointer.

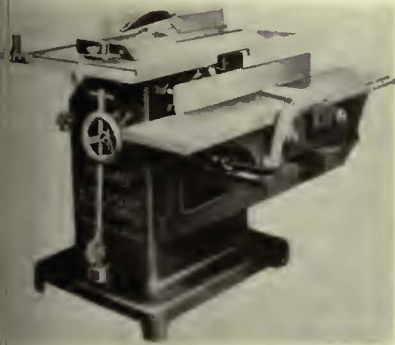
The motor develops sufficient power to rip 2½-in. stock at a satisfactory speed. The motor-on-arbor construction makes it possible to eliminate belts, gears or flexible couplings and provides a most efficient and positive drive.

The machine is mounted on a portable truck type base. Two rollers at the back and two stationary feet at the front of the base provide a firm setting on the floor when the machine is in operation. By pulling the handle forward to a position for moving

th machine a cam is raised, which in turn automatically lifts the feet from the floor and brings the weight of the machine on a third roller which is carried on a swivel bearing moving with the handle. This makes a convenient means of moving the machine from place to place as occasion demands.

The jointer tables are adjustable in height by means of small hand wheels under the ends. The machine will handle work up to 8 in. wide. The adjustment of the front table will allow a depth of cut to $\frac{1}{2}$ in. and a rabbeting groove in the rear table allows the cutting of rabbets up to the depth.

The fence can be set at any desired position on the front table. It is adjustable from any angle from 90 deg. to 45 deg. The 30-in. x 34-in. saw table is properly machined and can be tilted to any angle up to 45 deg. and instantly locked at the desired setting. It is an iron casting, stiff,



Motor-on-arbor type of universal saw and 8-in. jointer

will ribbed and similar to that supplied on high-grade machines. A dial with graduations and a pointer indicate the exact position of the table at all times. A stop is provided to facilitate a quick and accurate return to the horizontal position. A cross-cut gage can be used on either side of the saw, two slots in the table, one on either side, being arranged for this purpose. The ripping gage can also be used on either side of the saw. The tightening of the lever-head screw locks the ripping gage in position and lines it up automatically with the saw.

A saw guard protects the operator and fits down over the saw. It can be set instantly to allow any thickness of stock to be cut. A splitter guard is also part of the safety equipment. It keeps the stock from pinching the saw. A saw 12 in. in diameter is used which may be raised and lowered from flush with the table to high enough to cut $2\frac{1}{2}$ -in stock.

Temperature Compensation Features Watt-Hour Meter



Portable watt-hour meter with temperature compensation features

SEVERAL advantages are claimed for a new type OB portable standard watt-hour meter which has recently been placed on the market by the Westinghouse Electric & Manufacturing Company. The outstanding improvement is the compensation for temperature errors at both unity power factor and low power factor, which is inherently permanent for both the electromagnets and the permanent magnets and does not depend on the movement of mechanical parts with the variation in temperature.

Superior accuracy is obtained along with a decrease in size and weight. The micrometer adjustments have been simplified and the electromagnets are of the one-piece OB type. A

zero reset is provided by which both pointers can be adjusted. Potential settings are changed by means of a small switch, and three current binding posts are used, so that the meter may be connected for either 1 or 10-amp. capacity.

New Automatic Non-Electrical Turnstile

“COINPASSOR” is the trade name given to the new automatic coin-controlled turnstile recently developed and put on the market by the Perey Manufacturing Company, Inc., New York, N. Y. The machine is non-electrical and therefore requires no wiring installation.

The important operating principle is the use which it makes of the coin or token. Instead of using the coin to operate some part of the mechanism, the “Coinpassor” makes the coin a part of the mechanism which the patron himself operates in passing through. The coin plays only a passive part in the operation of the turnstile, yet without the coin the mechanism is, in effect, incomplete and cannot operate.

The Brooklyn-Manhattan Transit Corporation, operating subways and elevated railways in New York City and Brooklyn, has given it a thorough trial, having installed 25 of them in its busiest stations, and reports that they have stood up satisfactorily with only routine attention. The machines have also been used by the Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey.



Battery of Perey non-electrical turnstiles installed in B.-M. T. subway station

Association Activities

Problems of Commissioners Treated in Committee Reports

MOTOR vehicle transportation, public ownership and operation, grade crossings and public relations were the principal subjects covered by committees of the National Association of Railroad and Utilities Commissioners at their convention held at Dallas, Tex., Oct. 17 to 21. Each report covered an important phase of regulation of public utilities, bringing enlightenment on some particular problem of the commissioners.

MOTOR VEHICLE REGULATION

The report of the motor vehicle transportation committee stated that if regulation is to accomplish the best possible results it should be all inclusive. That is, all classes of operations must come under the purview of the law if it is to be made really effective and prevent discrimination, both in the matter of rates and charges and as between the various operators. It is quite obvious if the man operating between fixed termini and upon regular schedule, and who under these conditions must of necessity file tariffs and adhere thereto, is to be faced with the competition of unlicensed and unbridled operators who would take from him only the cream of the business paying the most profitable returns, that he will be in a very unprofitable condition.

The opposition to regulation evidenced on the part of the public in its early stages has largely disappeared. The public has come to a realization of the benefits of proper regulation, and that realization is reflected in the activities of enforcement officers.

Inability to accumulate accurate data over a considerable period of time reflecting the results of the operation of the motor vehicle in the public service is a handicap to regulatory authority in reaching scientific conclusions. The explanation of this is that apparently many operators have had little or no business training, and their volume of business is too small to warrant the expenses incident to the employment of skilled clerical forces. Another explanation is found in the fact that the federal government has not yet assumed supervision, and also that there has not always been helpful co-operation on the part of state and county peace officers in the strict enforcement of state laws, which, in the early stages of regulation, were not always popular.

Another of the difficulties confronting proper regulation is the activity of the fellow engaged in "private-contract" operations. Even some of those operat-

ing under permits between fixed termini and on regular schedules have asserted the right to handle this class of business. It is difficult to determine the dividing line between the common carrier and the man engaged under private contract by motor vehicle.

PUBLIC OWNERSHIP

Public operation of public utilities, asserted the public ownership and operation committee report, cuts deeply at the heart of our American system of business and government. Our system of private ownership and operation has been brought about by evolution based on ideas which permeated our whole life and methods of thought. In this country the development and conduct of our industries was wisely left to the initiative of private citizens, and our conception of the relation of government to business has been in the main the simple one that government existed merely to prevent the rights of activities of one man from encroaching upon the equal rights of another.

General management and supervision are found to suffer with public administration, and the period of service of public employees is generally brief, due to the fortunes of politics. The

reward of labor is generally less in public employ, and public officials too often find that they are bound by laws or practices that do not permit of the discretionary power that may be exercised in private employment. As a general thing, utilities owned and operated by the public furnish inferior service to that furnished by privately owned and operated utilities. They are on a lower level generally than the privately owned corporations, and as a rule they are slow in responding to new discoveries and new methods and often fail to supervise their equipment while discriminatory rates are as flagrant as they were prior to regulations in private plants.

All privately owned public utilities begin with systematic engineering plans of construction work, and there arise the first economy in favor of private operations. In organizing the staff to design and build, merit and efficiency alone are considered, and each man is selected and each move is made to secure the largest, quickest and safest return for the money expended. Political considerations do not enter.

Throughout the business world the best service is rendered when there is hope of reward, and the best commodity is produced when there is hope of profit. The losses due to extravagance and misdirected efforts of public operations of utilities will represent enormous dividends on properly applied capital and generally a plant can be built and operated at less cost by private capital than by public funds. All of these things, we believe, go to make public operations of public utilities undesirable.

Not agreeing with the views of the remainder of the committee on public ownership and operation, Joseph B. Eastman prepared a separate statement. He explained that these industries are very properly called, not private, but public utilities, and that public ownership and operation of utilities would not mean an entry by the government into the field of private business. Ownership and operation are different, he stated, and of the two operation is the more debatable. Public regulation is very necessary for private enterprise, he added.

PUBLIC RELATIONS

The committee on public relations in its report made three recommendations for the establishment of proper relations in the field of public utility service:

1. That the different utility companies faithfully and courteously fulfill all their assumed obligations to serve the public and consistently inform the public as a co-partner in business on all matters.

2. That the public, as a co-partner in the utility industry, should be enlightened by educational programs in schools

COMING MEETINGS

OF

Electric Railway and Allied Associations

Nov. 2-3—Iowa Electric Railway Association, operating and maintenance sections, annual convention, Blackhawk Hotel, Davenport, Iowa.

Nov. 4—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 33 West 39th Street, New York, N. Y.

Nov. 4—American Institute Electrical Engineers, New York Section, Engineering Societies Building, New York City.

Nov. 17-18—American Society Mechanical Engineers, annual meeting, Engineering Societies Building, 29 West 39th Street, New York, N. Y.

Nov. 17-18—Personnel Research Federation, Accident Reduction section, 40 West 40th Street, New York, N. Y.

Jan. 26-27—Central Electric Railway Association, Cincinnati, Ohio.

by the public press, by lectures, and by general authentic publicity information on the fundamental principles pertaining to utility companies, their organization, operation, service, and regulation, and particularly as to the vital importance of financially sound utility companies and the individual and public importance of the service they render.

3. That regulatory commissions: (a) make every reasonable effort to impress upon utility companies coming under their jurisdiction the necessity of good public relations and their duty in maintaining such relations, to keep their patrons honestly informed on all matters of legitimate personal interest in connection with their operation. (b) Give to the public press all information of public interest pertaining to their duties and activities as regulatory bodies. (c) Co-operate as far as possible with the educational institutions of the state in an effort to establish a carefully prepared study of public utilities, public utility companies, and public utility regulation, in the public schools and colleges. (d) Conjoin with other commissions in establishing standard rules of practice and procedure wherever practical, and in co-ordinating the regulator functions of the different state and federal commissions.

GRADE CROSSINGS

The safety of travel at grade crossings measured by the mental attitude of the travelers was the conclusion of a committee on grade crossings and trespassing on railroads. The committee recommended that educational methods be employed to correct the mental attitude of the public and to promote observance of safety rules. It also recommended that grade crossings be eliminated wherever possible.

Iowa Association Announces Program

REDUCING operating costs of electric railway transportation without impairment of service will be the theme of the annual convention of the operators section, Iowa Electric Railway Association, which will be held at the Blackhawk Hotel, Davenport, Iowa, on Nov. 2-3. The meetings will be led by chairman John Sutherland. Following the program:

Wednesday Morning, Nov. 2

Welcome from Davenport, by Louis E. Oddvig, Mayor.
"Some of the Problems Confronting the Electric Railways of Today and How They Have Been Met at Rockford, Ill.," by A. P. Lewis, general superintendent Rockford & Interurban Railway and Rockford City Traction Company.
"Stop Practices and Elimination of Equipment Failures," by Henry Cordell, waste mechanic Chicago, North Shore & Milwaukee Railroad.

Wednesday Afternoon

A tour of inspection of railway properties in the Tri-Cities, including the repairs in Rock Island, arranged through the courtesy of the Tri-City Railway.

Wednesday Evening

Annual convention banquet.

Thursday Morning

"Making the Most of Motor Coach Popularity in Bringing Back Riders," by D. D. Bentzinger, assistant to general manager Iowa Southern Utilities Company, Centerville, Iowa.

"The Importance of Freight Business in Building Interurban Revenues," by C. F. Doge, general superintendent Clinton, Davenport & Muscatine Railway.

"Co-ordination of Motor Coaches and Street Cars and Operation and Maintenance of Both," by A. H. Smith, superintendent Dubuque Electric Company.

Thursday Afternoon

"Track Construction and Maintenance," by W. L. Wilson, civil engineer Des Moines City Railway.

"The Automatic Treadle Door and Its Relation to the Modern Car," by R. S. Frehse, sales engineer National Pneumatic Company.

"The Gas-Electric Drive for Motor Coach Operation," by W. A. Clough, engineer General Electric Company.

A.I.E.E. to Discuss City Growth

"PREDICTING the Future for New York" is the subject for the next meeting of the New York Section of the A.I.E.E., to be held on Nov. 4. The following papers will be presented:

"Probable Growth of New York City and Distribution of Population," by E. P. Goodrich, consulting engineer on city planning for the Sage Foundation.

"Architectural Requirements and Building Service," by R. H. Shreve, president New York Building Congress.

"Suburban Transportation," by L. S. Miller, president New York, Westchester & Boston Railway.

"Urban Transportation," by C. E. Smith, consulting engineer.

"Telephone Service," by J. S. McCullough, president New York Telephone Company.

"Light and Power Service," by J. W. Lieb, vice-president and general manager New York Edison Company.

American Association News

Engineers' Standing Committees Announced

STANDING committees of the Engineering Association on power, purchases and stores, rolling stock, and way and structures have been completed. These are the continuing committees which have charge of the activities of the four principal divisions of the association's committee work. The personnel follows:

POWER

W. E. BRYAN, superintendent of power United Railways of St. Louis, St. Louis, Mo., chairman.

W. H. BASSETT, Waterbury, Conn.
L. W. BIRCH, Mansfield, Ohio.
C. A. BUTCHER, East Pittsburgh, Pa.
M. W. COOKE, Pittsburgh, Pa.
H. A. KIDDER, New York, N. Y.
JOHN LEISENRING, Springfield, Ill.
J. F. NEILD, Toronto, Ont., Canada.
F. W. PETERS, Schenectady, N. Y.
W. J. QUINN, New York, N. Y.
D. L. SMITH, Chicago, Ill.
L. J. TURLEY, Los Angeles, Cal.

PURCHASES AND STORES

JOHN Y. BAYLISS, director of purchases and supplies Virginia Electric & Power Company, Richmond, Va., chairman.

A. S. DUNCAN, East Pittsburgh, Pa.
A. L. FISHER, Cincinnati, Ohio.
J. FLEMING, Washington, D. C.
B. W. FORKNER, Mansfield, Ohio.
A. E. HATTON, Pittsburgh, Pa.
F. A. JORDAN, Atlanta, Ga.
E. A. MURPHY, Indianapolis, Ind.
A. A. ORDWAY, Boston, Mass.
W. E. SCOTT, Philadelphia, Pa.
C. THORBURN, Los Angeles, Cal.
W. J. WALKER, Schenectady, N. Y.

ROLLING STOCK

A. T. CLARK, superintendent rolling stock and shops United Railways &

Electric Company of Baltimore, Baltimore, Md., chairman.

R. S. BULL, superintendent of equipment Pittsburgh Railways, Pittsburgh, Pa., vice-chairman.

V. W. BERRY, Richmond, Va.

C. BETHEL, East Pittsburgh, Pa.

W. C. BOLT, Chelsea, Mass.

J. M. BOSEBURY, Springfield, Ill.

J. A. BROOKS, Philadelphia, Pa.

M. R. HANNA, Schenectady, N. Y.

J. S. MCWHIRTER, New York, N. Y.

A. D. MCWHORTER, Memphis, Tenn.

T. H. NICHOLL, Anderson, Ind.

R. B. SMYTH, Boston, Mass.

WAY AND STRUCTURES

H. H. GEORGE, assistant to chief engineer Public Service Production Company, Newark, N. J., chairman.

E. M. T. RYDER, way engineer Third Avenue Railway System, New York, N. Y., vice-chairman.

C. A. ALDEN, Steelton, Pa.

C. H. CLARK, Cleveland, Ohio.

E. B. ENTWISLE, Johnstown, Pa.

C. L. HAWKINS, St. Louis, Mo.

W. G. HULBERT, Easton, Pa.

J. R. MCKAY, Fort Wayne, Ind.

C. A. SMITH, Atlanta, Ga.

A. T. SPENCER, Montreal, Quebec, Canada.

H. M. STEWARD, Boston, Mass.

J. H. SUNDMAKER, Cincinnati, Ohio.

F. B. WALKER, Boston, Mass.

"Met" Section Meetings Announced

MEETINGS for the current season of the Metropolitan Section, A.E.R.A., are scheduled as follows: Nov. 4 and Dec. 2, 1927; Jan. 6, Feb. 3, March 2, April 6, and May 4, 1928. The hour and place of each meeting will be announced as arrangements are completed.

News of the Industry

Piedmont Renews Its Application

Charles Evans Hughes has been engaged as counsel by the Piedmont & Northern Railway in its effort to get permission from the Interstate Commerce Commission to extend these lines.

The road filed exceptions with the commission on Oct. 25 to a proposed report by Examiner Haskell Davis refusing to permit the extensions on the ground, among other things, that they would parallel for a long distance the Southern Railway and are not needed. Other exceptions were filed by Governor Richards of South Carolina and several municipalities and civic organizations which favor the extensions.

The Piedmont & Northern claims that its original purpose was to extend its lines as an interurban electric road but that World War conditions interfered with its program.

The Southern Railway, in earlier proceedings, declared if the application is granted its annual earnings will be lessened by \$10,000,000. Other steam roads aligned against the granting of the application of the electric railway are the Seaboard Air Line, Atlantic Coast Line and the Clinchfield.

Ten Cents in Beacon

An increase in fare in two operating zones from 7 cents to 10 cents with three tickets for 25 cents was permitted the Fishkill Electric Railway, Beacon, N. Y., by the Public Service Commission in an order dated Oct. 20. The company was also authorized to increase its 54-trip \$5.40 commutation ticket rate to \$6. There will be no change in school children's tickets.

The value of the property used in giving service was placed at \$246,719. After payment of interest charges and amortization there would be available \$5,885 for dividends and extraordinary expenses. Commissioner Van Namee's memorandum stated that the latter amount would hardly be realized and that it was apparent that any increase in revenue which might be obtained from the new rate would not suffice for a reasonable return upon the property used in giving service.

The railway has been in operation since 1892.

Columbians Awakened to Need of Better Transportation

Sentiment which scores the 10-cent jitney and a crippled bus system in Columbia, S. C., is rapidly crystallizing in favor of the street car which deserted the streets of the city last March. Now in the hands of the Supreme Court is the action of the Attorney-General of

the state seeking a mandamus to enforce the resumption of street car service. Railway service was formerly supplied by the Columbia Railway, Gas & Electric Company.

In a recent editorial, the leading daily of Columbia, the *State*, takes the position that unless better transportation be provided growth will be hampered and even very seriously retarded. Where is there a town of 100,000 inhabitants

without railway service, says this writer who states that it is almost inconceivable that a town could grow to such size under the heavy handicap imposed by deprivation of electric railway service. Bungling over the "transportation situation" is charged with a net result that cars are not in operation, buses and jitneys are not prospering and the public is dissatisfied. "Think it over, gentlemen—all of you."

Thomas N. McCarter Honored

Employees of New Jersey company surprise their president on occasion of the 60th anniversary of his birthday. Stock-selling campaign huge success



Thomas N. McCarter

ABOUT 1,000 employees of the Public Service Corporation of New Jersey assembled in the auditorium of the Newark Terminal Building on the morning of Oct. 20 to participate in the ceremonies attendant on the awarding of trophies and prizes in connection with the recent 6 per cent cumulative preferred stock campaign, in which 115,226 shares were sold to 15,492 subscribers.

At the conclusion of the trophy ceremonies, the meeting was turned into a birthday party in honor of the 60th birthday anniversary of President Thomas N. McCarter. A huge bunch of American beauty roses was presented to the president by John Craig, Rutherford, one of the oldest employees in any of the companies. Mr. Craig is 69 years old and has a service record of 35 years. He is employed at the Kearney electric generating station.

As the president rose to speak, the chair in which he was seated during the presentations was transformed to represent a huge birthday cake. Sixty large electric globes were set on a white table with the Public Service emblem in the background.

Six grand prizes and six trophies presented by the president and vice presidents, were awarded for the large number of shares sold and for the greatest number of subscribers to the stock.

At the conclusion of the presentation of these awards President McCarter thanked the whole Public Service organization for its splendid work in the campaign.

The grand prize winners were: First, \$150, William T. Blackwell, Newark general lighting representative; second, \$125, Timothy J. Fields, Paterson, instructor, railway; third, \$100, A. Hebbe, foreman, Newark Railway Shops; fourth, \$75, Miss Annie Morris, combination representative Burlington commercial office; fifth, \$50, George S. Curtis, Paterson, Passaic Division superintendent of electric distribution; sixth, \$25, Walter Johnson, assistant cashier, Trenton commercial office.

The trophies were silver cups and were awarded as follows: The president's trophy to the Southern Division Vice-President R. R. Young, in charge of sales, presented his trophy to the commercial department, Southern Division; Vice-President Edgar Allegaert, the electric department, to the Essex Division; Vice-President John Clark of the gas department, to the Bergen Division; Vice-President Matthew R. Boylan of the railway transportation companies, to the Southern Division; Vice-President N. Carle of the Production Company, the electrical engineering department; Vice-President P. S. Young, in charge of finance, to the general office group.

Draft of Indeterminate Permit Bill Presented

Let of traction enabling bills is received by Chicago City Council sub-committee. Realtors condemn indeterminate permit plan of companies. Municipal ownership advocates active

COMPLETING the work of preparing five legislative bills to be used as a basis for settling Chicago's traction problem, James Breen, assistant corporation counsel, has turned over to the City Council's sub-committee on local transportation a tentative draft of a new indeterminate permit bill. Four bills dealing with subway construction, consolidation, a local transit commission and repeal of the twenty-year limit on electric railway franchises have previously been accepted and approved by the sub-committee.

As interpreted by the city attorney, the indeterminate measure, which is regarded by the companies as the most valuable of all to the solution of the problem, allows the city the option of granting either a fixed-term franchise or one without time limit. The bill introduced into the Legislature last spring by the companies provided for an indeterminate franchise only.

A final meeting of the sub-committee to approve and recommend to the full committee on local transportation the entire set of bills will be held on Nov. 2.

Sharp criticism of the indeterminate plan as proposed by the companies was voiced during the week ended Oct. 22 by several speakers at a meeting of the Cook County Real Estate Board. Edward W. Bemis, consulting engineer, urged the realtors to support either the Lisman or the Detroit purchase plan as the only practical measures which have so far been presented to the City Council. This proposal to grant indeterminate permits, he contended, would give the present companies complete and perpetual control of the city's transit facilities.

Although he had no specific scheme to submit, Carl D. Thompson, secretary of the Public Ownership League of America, who was another speaker, suggested that acceptance of the plan presented by executives of the surface and elevated line systems would absolutely preclude any chance of the city to own its local transportation systems.

Under the Lisman ordinance, now pending in the City Council and outlined previously in the ELECTRIC RAILWAY JOURNAL, the City Council would give to the New York banking syndicate headed by Frederick J. Lisman a railway franchise for twenty years and renewal for ten years more, after which the entire surface lines system would be turned over to the city for \$1. The Detroit purchase plan was proposed to the City Council several months ago as means of negotiating purchase of the car lines by the city and is based on methods said to be

successfully employed by the city of Detroit.

Local municipal ownership advocates, headed by Attorney Henry M. Ashton, have begun circulating a petition asking for a referendum next April on the question of supplanting the present private railway operations with a large system of municipally owned and operated motor coaches. If they succeed in getting the necessary 125,000 signatures, or 25 per cent of all registered, the following questions will be placed upon the ballot at the spring election:

1. Shall the city of Chicago proceed at once to motorize its entire surface lines transportation by purchasing 4,400 pneumatic-tired buses and equipment out of the

\$55,000,000 now in the city traction fund?

2. Shall the city of Chicago proceed to operate buses?

3. Shall the city of Chicago refuse to grant any permit or franchise giving the Chicago Surface Lines or any other private corporation the right to operate street cars in the streets of Chicago?

Coincident with the announcement of the municipal ownership petition, Corporation Counsel Samuel Ettleson handed down a rule which again defeats proposals to borrow money from the city traction fund, a sum which has been accumulated by street car riders during the period of the twenty-year franchise granted to the Chicago Surface Lines in 1907.

The decision was rendered in connection with the request of the City Comptroller to be allowed to borrow money from this fund to tide the city government over until this year's taxes are received and to give city bonds as security. Mr. Ettleson held, however, that the city might sell bonds to the traction fund up to the \$15,000,000 maximum allowed by the traction fund laws.

McGraw-Hill and A. W. Shaw Companies Form Subsidiary

Four national circulation industrial publications affected by publishing plan which will combine them into two monthly papers

INCORPORATION of a subsidiary to publish four long-established national circulation industrial publications just acquired was announced on Oct. 26 by the McGraw-Hill Publishing Company, Inc., New York, and the A. W. Shaw Company, Chicago. The subsidiary is the McGraw-Shaw Company and the papers affected are *Factory*, *Industrial Management*, *Industry Illustrated* and *Industrial Engineering*. Under the announced publishing plan, the first two papers will be combined as *Factory and Industrial Management*, starting with the January issue. The third paper will be consolidated with *Industrial Engineering*, a McGraw-Hill publication, starting with the December issue.

Facts underlying the formation of the subsidiary were outlined in a statement by James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., and in a letter sent to advertisers in the affected papers by A. P. Gumaer, as manager of *Industrial Engineering*, with which is consolidated *Industry Illustrated*, and by James O. Peck, as manager of *Factory and Industrial Management*.

The statement by Mr. McGraw stressed the fact that the arrangement by which the two parent companies control jointly a subsidiary publishing important publications devoted to industry is in no sense or degree a merger of the McGraw-Hill and Shaw groups of journals. He pointed out that the two companies have effected

a separate subsidiary organization to serve more adequately in a publishing way those manufacturers whose broad marketing problems extend throughout the range of industry.

LETTER GIVES FACTS

The letter from the two publication managers gives the details of the reasons for the latest announced development in the field of business paper publishing.

The communication addressed to advertisers says:

Believing that you will be greatly interested in a publishing move for better marketing we want you to know of plans to intensify the service value of several papers with which you are familiar—*Factory*, *Industrial Management*, *Industrial Engineering* and *Industry Illustrated*.

Two consolidations have been made and plans are being put into effect to add materially to the strength of their editorial, circulation and advertising functions.

To carry out this program, the McGraw-Hill Publishing Company, Inc., and the A. W. Shaw Company have formed a subsidiary publishing company known as the McGraw-Shaw Company. No change has been made, however, in the corporate status of the parent companies. *Factory*, heretofore published by the A. W. Shaw Company, and *Industrial Management*, recently acquired by the McGraw-Hill Publishing Company, will appear in January as one publication under the name of *Factory and Industrial Management*.

Industrial Engineering, heretofore published by the McGraw-Hill Publishing

Company, and *Industry Illustrated*, recently acquired, will appear in December under the name *Industrial Engineering*, with which is consolidated *Industry Illustrated*.

While these consolidated publications will retain their original fields it is the aim of the McGraw-Shaw Company, through far-sighted industrial journalism, to keep a step ahead of the changing production needs of industry, whether those needs are influenced by management, finance, engineering, production or marketing.

Factory and Industrial Management will serve the top production executives in problems of production management and policy. *Industrial Engineering*, with which

is consolidated *Industry Illustrated*, will deal with all phases of plant services—mechanical, electrical, or otherwise—through which production is attained.

The letter concludes:

Seldom have publishers had the opportunity to offer a more tangible service to industry or to individual manufacturers. Details of the plan will show how manufacturers can do a more economical and efficient job of advertising and selling.

James H. McGraw is chairman of the board of the McGraw-Shaw Company. A. W. Shaw is president.

Holyoke Decision Significant

Massachusetts regulatory body insists railway shall be permitted to charge rates which under reasonably prudent and economical management will yield a fair return

UNUSUAL interest attaches to the decision by the Massachusetts Department of Public Utilities to permit the Holyoke Street Railway to increase its rate of fares. The schedule is a modification of the one the company filed, but is intended to enable the company to maintain the quotation of its stock at par. The commission filed a long decision which outlines the financial policy to be followed in Massachusetts in regard to railway fares.

The matter can be understood intelligently only by the recital of some of the recent events in connection with the case. On Aug. 1, 1927, the company filed tariffs with the commission to become effective on Aug. 31. These tariffs were intended to provide for an increase in the regular rates of cash fares from 6 cents to 10 cents, with a provision for the sale of four tickets for 30 cents, good for a ride in any one fare zone. They also provide for certain overlaps, for a ride from any part of the central zone, called Section A, to any other part, by the use of transfers when necessary, upon the payment of a 10-cent cash fare, for special tickets between various parts of the system when sold in strips varying from four to five, and for an increase in pupils' tickets from 3 cents to 5 cents when sold in strips of ten.

The date the rates were to go into effect was suspended from time to time, the last suspension being until Oct. 22.

In view of the public interest and discussion which has taken place in this matter, the commission prefaced its consideration of the subject with a few fundamental principles sometimes lost to sight in the heat of advocacy. In this connection the state body said:

General Laws of Massachusetts, Chapter 159, section 14, requires this department, before it sets aside rates fixed by a carrier, to determine that the same are unjust and unreasonable, and also requires that, if the department shall be of such opinion, it shall determine the just and reasonable rates to be charged for the service to be performed. Where the question

involved is not one of specific rates, but as here, of the whole rate structure of the company, this department is bound to follow the interpretation which has been given to this and similar statutes by the courts of this Commonwealth. There can be no doubt that this statute, which of course is mandatory upon us, interpreted in the light of these decisions, obliges us to permit the carrier to charge such rates as will give it a fair return upon the capital employed in the undertaking. We must perforce, therefore, approach this question in that view of the law. Apart from any question of law, we think it obvious that a public utility ought to be allowed rates under which reasonably prudent and economical management will yield a return upon the capital employed in the enterprise sufficient to enable it to sell its shares of stock.

Under the laws of the Commonwealth a street railway is obliged to sell its stock at par or not at all. Any policy, therefore, which results in a failure to maintain the value of its stock at par cripples its ability to meet the needs of the community, impairs its credit and, if long continued, results in financial disaster to the company and great inconvenience to the public. So long as the dividends paid on the capital stock of the company are only such as are necessary under prudent management to maintain the credit of the company and its ability to obtain new capital needed in its development, the interests of the company and its passengers are substantially identical. Adequate service cannot be given unless the passengers pay that which is necessary to provide the same.

The capital of the company consists of \$1,342,000 of common stock, on which a premium of \$276,160 was paid into the treasury of the company. The request of the company was that it be permitted to charge rates sufficient to yield a return of 6 per cent upon its investment. During the last seven years the company paid dividends of 6 per cent on its capital stock. This really was equivalent to only 4.98 per cent on the stock and premiums. In the last two years, at least, the company did not, in the opinion of the commission, make sufficient provision for depreciation, an operating expense necessary and proper to be charged against earnings. While

the railway paid a dividend of 6 per cent in 1926, it actually earned only 4.17 per cent on its stock and premiums. For the first six months of this year its passenger revenue was \$24,000 less than for the similar period last year, and up to the present no dividend has been paid this year. Its passenger revenue in 1926 was \$188,000 less than in 1920 and 3,000,000 fewer passengers were carried in 1926 than in 1920, in spite of the fact that in the year 1926 the company operated 112,000 more passenger car-miles and 11,500 more passenger car-hours than in 1920. If there had been no falling off in the number of passengers carried in 1926, as contrasted with 1920, the company would have received additional revenue under its existing fares equivalent to the proposed increases. It was generally conceded by all at the hearings that the company had been and is giving good service to its patrons and that it has been and is well managed.

The company contended that to earn a net return of 6 per cent on its invested capital, on the basis of last year's earnings and of the first six months of this year, it would need \$207,646 additional gross revenue. Based on its own experience and that of other companies, it estimated that the proposed schedule would yield an additional revenue of about \$173,006. No reliable evidence was offered to refute this estimate, and, based on the experience of other railways that have increased their fares, the commission did not think that this estimate was excessive. To the contention by Holyoke people of discrimination against them, the commission said:

We feel that the company should permit passengers to ride from any part of Section H to any part of Section G, and vice versa, upon the payment of a 10-cent cash fare, issuing transfers therefor, and thus place riders in Chicopee substantially upon a parity with riders in Holyoke. If this should be done, we believe that there would not be any unfair or unjust discrimination.

In concluding its decision the commission said:

The proposed schedule provides for the sale of pupils' tickets in strips of ten for 50 cents, each ticket good for one ride in each fare zone. This requires pupils to pay 5 cents for a ride which costs regular patrons 7½ cents. We are of the opinion that pupils' tickets should be issued in strips of ten for 38 cents, to be sold in the manner prescribed in the schedule, each ticket to be good for one ride in each zone or section where a 7½-cent ticket enables a passenger to ride and that pupils' tickets should be sold in strips of ten for 50 cents, each ticket to be good for one ride between points where a 10-cent ticket or a 10-cent cash fare enables a passenger to ride.

When the tariff is amended in accordance with the changes above set forth, we think it should be allowed to go into effect. Accordingly, it is ordered that the tariff filed by the Holyoke Street Railway on Aug. 1, 1927, be canceled, with leave to the company to file an amended tariff carrying out the changes above outlined, and, upon such an amended tariff being filed, it shall become effective forthwith.

Action on Omaha Franchise on Oct. 31

The City Council of Omaha, Neb., has finished its consideration of the draft of the new franchise for the Omaha & Council Bluffs Street Railway and will take final action on it on Oct. 31. In the meanwhile the officers and all attorneys for the company are considering the draft, with the expectation of entering objections to several of its provisions. As the draft now stands it calls for a special election on Jan. 10, 1928. In this draft the Council has no right to meet the various objections urged by voters at the election where the company's draft was defeated last year.

One Dollar Weekly Pass for St. Petersburg

Weekly passes on the line of the Municipal Railways, St. Petersburg, Fla., will be put in force about Nov. 1. The passes will sell for \$1. While the pass will be accepted on all railway lines in the city, it cannot be used on the buses. It was also made clear that passes could not be used by school children as the city gave these patrons the benefit of a 5-cent fare with transfer privileges from car to bus or from bus to car. The weekly pass was decided upon especially for those who live in the outlying districts and who use the cars regularly in going to and from their work. Persons making four trips a day on the street car will be able to save 60 cents a week by using the pass. Regular fares for seven days on four trips a day would amount to \$1.96.

Franchises Sought by Key System

The Key System Transit Company, Oakland, Cal., has applied to the City Council of Richmond for 50-year franchises for all its lines in Richmond. Application followed a recent agreement that the company would maintain local car service if the long-term franchises were authorized. Several franchise contracts are near expiration.

Electrification Planned of Reading Suburban Lines

Plans are being prepared, it is said, for the electrification of suburban lines on the Reading Railroad, Philadelphia. Work will start on the Chestnut Hill branch next year and the work will be completed in about two years. Electrification of the lines to Glenside and Langhorne will probably follow and the cost of electrifying the three lines will be \$10,000,000 to \$12,000,000. Electrifying the Chestnut Hill branch will cost between \$4,000,000 and \$5,000,000, including the company's share of the cost of removing a number of grade crossings. Included in cost is the expense of electrifying the Reading Terminal at Twelfth and Market Streets in Philadelphia.

The company has placed orders for 35,500 tons of 130-lb. steel rails for 1928 delivery, which is about the same as last year, when 36,000 tons were ordered for 1927 road work. It is well supplied with steam equipment and no additions are contemplated.

As Things Are and as They Were in Altoona

Progress week in Altoona, Pa., which opened Oct. 25, is being participated in by the Altoona & Logan Valley Electric Railway, through a display arranged by the Altoona Chamber of Commerce. Large windows in the center of the business district were given over to the railway and in them is pictured a likeness of the newest in rolling stock owned by the company, together with the "standard" cars of 1900 and a picture of the first car ever operated in Altoona, a horse-drawn one.

Artistic Effect Important Consideration in Jamestown

The color scheme for cars most popular in the voting contest has been adopted by the Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y. When the company purchased six new cars it asked the citizens to select the color for the equipment. The suggestion was first advanced by one of the company's department heads, who proposed that the cars be painted the colors of the city's three junior high schools, with a voting contest to choose the most popular combination.

Three cars were painted desert sand, deep cream, pyramid gray and fire red for Lincoln Junior high school; azure blue, deep cream, sage green, blue and fire red for Washington Junior high school, and pigskin, romany maroon, deep cream, fire red and gray for Jefferson Junior high school. The cars bore the pennant of the school represented. After a three-day contest, the Lincoln Junior high school combination, with a total of 463 votes, received the highest number of the 804 cast.

W. H. Pickard, traffic manager, said that the number of votes cast showed that the people were really interested in how the cars were painted, so that when the order for the new cars was placed the desired color scheme was adopted with slight modifications.

Ohio Fare Increase Turned Down

Stark County Commissioners rejected the request of the Northern Ohio Power & Light Company to increase the fare between Canton and Massillon, Ohio, from 15 cents to 25 cents. Other pleas for increased passenger rates were also turned down. As a result of the denial H. D. Berkaw, company superintendent, said that the case would be taken to the Public Utilities Commission. In its petition the company claimed that the present fare did not meet the operating expenses of the 8-mile line, which recently had been double-tracked.

School and Shut-in Children Have Own Car in San Francisco

Operation of a new parlor car for the use of children, principally for educational purposes, without charge, and also for the unprivileged and shut-in children, has been announced by Samuel Kahn, president of the Market Street Railway, San Francisco, Cal. The car is finished in white enamel, trimmed with gold, and fitted with all the latest safety appliances. The end sections boast of the latest type leather-upholstered seats. Thick carpet covers the floor of the center section, which has plush-cushioned wicker chairs and heavy plush window drapes.

Many trips are already scheduled to take technical classes of the San Francisco public and parochial schools to the company's car-building plant, the car operators' training room and one of the latest substations. T. A. Bragg, in charge of employment and training for the company, is acting as guide to the school classes. Technically trained men explain the mechanical and electrical processes in the various departments as the classes watch the inside workings of the big machines necessary to successful railway operation.

When schedules will permit, the car is to be devoted to unprivileged and shut-in children who need to get around and without some such service as this might not have an opportunity.

Louisville Carhouse Is Victim of Bandits

Masked bandits invaded the carhouse of the Louisville Railway, Louisville, Ky., on Oct. 16 and escaped with \$1,300 in cash and \$200 in car checks after forcing four employees to lie prone on the floor. Employees claim that the robbers had timed their visit, and had also learned just where the money was kept. However, a large safe containing \$1,500 and boxes holding 84 coin containers from street cars, not yet emptied, were ignored.

Public Utility Courses in Illinois University Work

The School of Commerce of Northwestern University is conducting afternoon and evening courses in public utilities in Wieboldt Hall, Chicago, during the 1927-28 semester. These emphasize the economic, financial, legal and managerial principles in effective operation and management. This curriculum was established in recognition of the ever-increasing importance of the functions performed in modern industrial society by public utilities.

The University of Illinois is also offering a course in Economics of Public Utilities, through its College of Commerce and Business Administration. The courses on operation of public utilities, management of public utilities, public utility administration and other phases are open to graduates as well as advanced undergraduates.

W. D. Mahon Warns of Dangers in Highly Competitive Business

The danger in bus and private automobile competition should arouse electric railway managements to the necessity of improving their services, in the opinion of W. D. Mahon, president of the Amalgamated Association. In a recent statement on present-day conditions he is reported to have said:

In the first place it would pay stockholders in these properties to reflect that the chief problems of management in the past have had to do with politics, economical operation and rate making. The business has been characterized by monopolistic conditions. "Ride the cars or stay at home," represented the laconic attitude toward development of business. Management must be jarred out of this state of mind if the street car industry is to prosper.

There will always be a use for street cars and a use for buses. Henry Ford once said, in discussing the street car problem, that nothing that ever came into the world and proved its usefulness had ever gone out of it. This union includes bus drivers as well as street car operatives, so it cannot be charged that our views are inspired by selfish interests.

The need of the moment is for intelligent efforts to improve street car service. Better cars should be provided. Comfort and speed should be sought. Plenty of new business remains to be developed. Automobile owners—many thousands of them—can be won back to street car riding if it is made more comfortable and more expeditious. The expense of motoring and the difficulties of parking would cause owners of cars to ride the trolley to business if they had not learned to despise the creeping rattlers that many companies operate.

One-Man Cars in Smaller Streets of Montreal

By decision of the City Council the way has been left open for the continued use of one-man trams in Montreal, Canada, in the smaller streets of the city, but not in the large thoroughfares. The question came before the Aldermen in the form of a report submitted by a committee suggesting that the use of these cars be prohibited in Montreal. A minority report recommended that the cars be given further trial. After a debate the Council decided the public interest would be best served by not taking a decisive stand against these tram vehicles in all city streets, and a motion was accepted in that sense.

Fatal Accident on Indiana Interurban

Eighteen persons were reported as injured on Oct. 14 when a car of the Union Traction Company of Indiana, Anderson, Ind., struck a truck trailer carrying a score of persons to a lodge dance at Emerson Avenue and the Honeybee line on the outskirts of the city of Indianapolis. A separate investigation of the accident has been ordered by the Indiana Public Service Commis-

sion. The conductor and motorman of the interurban, both of whom were injured and sent to the hospital, have been placed under arrest and released on \$2,500 bond. The driver of the truck, who was not injured, also was placed under arrest and held under a similar bond. The truck had passed over the track, but the trailer was squarely in the middle of the interurban line when the inbound car collided with it.

Resumption of New Jersey Line Sought

Residents of National Park, N. J., have presented a petition to the Borough Council demanding resumption of railway service from there to Camden and Woodbury, discontinued some time ago because of the building of a bridge over Big Timber Creek. The line is operated by the Public Service Railway.

Foreign News

Good Year for Brazilian Traction

Net earnings of the Brazilian Traction, Light & Power Company for the year ended Dec. 31, 1926, totaled \$12,278,654, compared with \$8,848,594 the previous year. Comparison of the balance sheet with the figures of previous years showed remarkable growth. In 1922 the property account stood at \$94,301,954. In 1926 it stood at \$140,701,014. In 1922 total assets were \$250,685,074. In 1926 this item stood at \$286,104,734. Total assets have not grown as rapidly as property account. The reason lies in the policy of writing off large amounts for depreciation. Reserves which were \$52,481,431 in 1922 have grown to \$83,896,762. The Brazilian Company itself has no funded debt, the items which total \$67,692,707 being the bonds of subsidiaries such as the Rio Tramways and São Paulo Electric Company. Sir Alexander MacKenzie, president of Brazilian and subsidiary companies, says in his report that Rio de Janeiro and São Paulo, the two principal cities which the company serves with transportation, electricity for heat and for power, have become the two principal industrial centers of South America, largely by reason of their abundance of cheap power and other modern facilities.

Proposed Co-ordination of London Passenger Services

The Automobile Association is carefully studying the proposed extension of the present London Traffic Combine to include under one management all the passenger services of the metropolis, including railways, omnibuses and tramway systems.

Considerable publicity has already been given to the advantages of the scheme as viewed from the standpoint of those whose interests are directly concerned in the furtherance of this project, but the Automobile Association takes the view that there is another angle from which these proposals have yet to be carefully analyzed.

In the absence of full particulars of this new "grouping" scheme, it is obviously impossible to express any definite opinions, but should a legislation be introduced to give effect to the scheme as at present outlined, the Automobile

Association will thoroughly examine the proposals and, through the medium of the motor legislation committee, take such action as may be necessary to safeguard the interests of the owners of private motor vehicles.

New Swiss Electrically Operated Cable Railway

Work has commenced on the construction of a new electrically operated cable railway between Lake Traub and Gerschnialp, near Engelberg, Switzerland. The line is being constructed on the Bleichert system. The difference in altitude between the upper and lower stations is about 6,560 ft., which it is expected will be covered in ten minutes.

Electrification Extended by Mexican Railway

Officials of the Mexican Railway, Ltd., have completed arrangements for the extension of the electric zone now operating over the Maltrata Incline eastward to Paso del Macho, a distance of about 22 miles. The most difficult portion of this grade section was converted to electrical operation in the latter part of 1924, and during the past year an additional 17 miles, fed from the single original substation, was placed in service.

Extension now under way will require an additional substation, which will be located at Portrero, a short distance east of Cordoba. Equipment for this extension will be supplied by the International General Electric Company. It includes line material and bonding and a complete 3,000-kw. substation, to contain two 1,500-kw., 3,000-volt synchronous motor-generator sets with transformers, switchboards and switching equipment. This station will be a duplicate of the present substation except in capacity.

When this extension is completed there will be a total of about 70 miles of electrified track running through the severest grade section of the line between Mexico City and Vera Cruz. Grades run as high as 5.25 per cent maximum, with an average of 4.7 per cent for about 25 miles. The remainder of the electric

one ranges from 2 to 3 per cent. All trains on these grades will be handled with regenerative electric braking and it is expected that the same 150-ton locomotives used on the original electric line will be used on the extension.

Power is to be supplied over a new transmission line from the Toxpango power plant of the Puebla Tramway, Light & Power Company, giving a reliability of service equal to that now being obtained by the original station at Altrata.

The overhead line will be supported entirely by steel structures fabricated from used rails which the company has on hand. Due to the circuitous route followed by the railway tracks, the 70 miles will be fed from two substations. The motive power for the electric zone includes ten locomotives of the six-axle type, with a normal hourly rating of 2,700 hp. These have been in service since 1924.

Coventry Shows Profit on Buses

The annual report of the Tramways and Motor Omnibus Department of the City of Coventry, England, for the year ended March 31, 1927, shows a net profit of £5,226, after interest and sinking fund payments on tramways, and a net profit of £9,851 for the bus system. The railway operating revenues for the year ended March 31, 1927, for the tramways were £97,256, and for the bus system £43,030.

Automatic Substations for Cape Town Suburban Railway

When the electrification now in progress on the Cape Town Suburban Railway is completed it will be the first one in South Africa to have all its substation equipment automatically operated and remote-controlled. The line runs from Cape Town to Simonstown, a distance of about 30 miles. It will have six substations, each of which will contain one or more pairs of 1,000-kw. rotary converters by which three-phase current at 33,000 or 12,000 volts from the Salt River power station will be converted to 1,500 volts direct current for operation.

The load dispatcher located at the central station will be able to start or stop the rotary converters at any of the substations and will be assured by means of visual indications that the machines have done what he wishes and are working properly. For this purpose, all-relay tandem supervisory system of power control of the General Electric Company of England has been adopted.

The twelve pairs of rotary converter sets, with automatic starting equipment, high-speed circuit breakers, etc., are being made at the company's Witton Engineering Works, Birmingham. Supervisory control equipment, usually a telephone engineering job, is being supplied by the Peel Connor Telephone Works, Coventry.

Recent Bus Developments

Bus Purchase Approved

Indiana court sanctions plan of Indianapolis Street Railway to take over Peoples Motor Bus

Judge Harry O. Chamberlin in the Circuit Court in Indianapolis on Oct. 25 ordered the Indiana Public Service Commission to approve and authorize the purchase of the stock of the Peoples Motor Coach Company by the Indianapolis Street Railway for \$500,000. The court also ordered the commission to approve the issue of \$500,000 of securities, paying 8 per cent interest, to finance the purchase.

Incidentally the decision is the first of its kind in the state under a law passed by the last Legislature, which gives the right of appeal to the Circuit Court from decisions of the Public Service Commission. It seems unlikely the decision will be subjected to a test which would also serve to try out the validity of the law.

The ruling ends a controversy begun last April 16 by the railway during which the Public Service Commission twice refused to approve the bus company sale. The last refusal was appealed to the Circuit Court. Given an opportunity to change its stand after the hearing before the Circuit Court, provided by law, the commission a third time refused to sanction the purchase.

According to Robert I. Todd, president of the railway, the co-ordination of the transportation system in the city will mean better service. The bus lines, he declared, will be continued and enlarged, with bus service direct from outlying districts now served by railway feeder lines. Except in one or two cases where it is impossible, feeder lines will run to the downtown district instead of ending at the terminal of some car line as at present.

Cost of bus transfers will be reduced from 3 to 2 cents and it will be possible to transfer from a bus to a car line or vice versa.

The Public Service Commission objected to the purchase on the grounds that \$500,000 was an excessive price to pay for the bus company and the 8 per cent interest rate was too high.

Informing the Public on Cars and Buses

The advantages of the street car and bus in one system are told by Thomas N. McCarter, president of the Public Service Corporation of New Jersey, in the Oct. 15 issue of *Forbes*. He makes it plain that the bus has achieved for itself a permanent place in the local transportation field, that its use is increasing rapidly and that it is popular with the traveling public.

In the same issue William A. McGarry tells the story of Joseph H. Alex-

ander and his "give the car rider what he wants." Mr. Alexander is president of the Cleveland Railway, Cleveland, Ohio.

Taxicabs Restrained at Brockton Fair

On the petition of the Eastern Massachusetts Street Railway, Boston, Mass., the Suffolk County Superior Court has granted an injunction to restrain the Blue Ribbon Garage, Inc., of Brockton, from operating five taxicabs for five days during the Brockton fair between the railroad station and the fair grounds. The court finds that the garage cannot compete with a railway without complying first with the state laws as to license and the filing of bonds with the Public Utilities Department.

Buses Run Over Rail Route in Salt Lake City

Permission to discontinue railway service on its Holliday line, below 33d South Street, in Salt Lake City, Utah, and to substitute bus service has been granted the Utah Light & Traction Company by the Public Utilities Commission of Utah. The bus line will be operated over the same route and with the same frequency as the street cars are run at present, and the fares will remain the same. The order of the commission granting the applications of the company provides that a suitable comfortable and convenient passenger depot be provided by the company at or near its terminal at the intersection of 33d South Street and Highland Drive.

Reduced Tickets in Worcester to Induce Riding

Operating officers of the Worcester Consolidated Street Railway, Worcester, Mass., announce that the reason for the adoption of the reduced rate tickets by the company on some of the suburban motor coach lines which it operates is an effort to induce riding in the company's motor cars rather than in the family car. The reduction in rates is expected to encourage more general use of the motor coaches that ply between Worcester and the suburban towns.

The lines affected by the reduced rates include Worcester to Northboro, Marlboro line, Worcester and Shrewsbury and the Worcester, West Bolyston, Oakdale and Clinton route. The purchase of reduced rate tickets enables passengers on these lines to save about 20 per cent in fares. The fare unit for those who do not use the tickets is 10 cents for each zone.

Fares a Factor on New Bus Line in District of Columbia

During a public hearing on an application of the Capital Traction Company, Washington, D. C., for authority to establish a new 25-cent de luxe motor coach line, operating from Cleveland Park to the heart of the business area, it was intimated that the railways of the district are planning to seek an increase in fare. William F. Ham, president of the Washington Railway & Electric Company, who appeared before the commission to oppose the creation of the new line, pointed out that the public desired better service, regardless of cost, but that the rate of fare now was too low to enable the companies to give better service. Mr. Ham's chief objection to the establishment of the new line was that it would compete with the Washington Railway & Electric Company's bus line in Cleveland Park. He said that that line had suffered a loss of \$38,000 since its establishment.

Partial Substitution by Bus in Green Bay

Bus service will be substituted for railway service on the Mather Street car line in Green Bay, Wis., and for the interurban service on the line between the city of Green Bay and the village of Duck Creek about Nov. 1. The City Council of Green Bay recently granted the Wisconsin Public Service Corporation this permission for an eight months trial period. The company is positive that the patrons of these lines will be converted to the bus service during the trial and have purchased three Yellow Cab company buses at an expense of about \$30,000.

Substitution in Troy

The Public Service Commission of New York on Oct. 11 approved the declaration of abandonment by the United Traction Company of that part of its railway line in Troy in Fifteenth Street between Hoosick and Congress Streets and also granted a certificate of convenience and necessity to the Capitol District Transportation Company, Inc., for the operation of a bus line in that part of Troy where the railway service is to be abandoned.

Muncie Operators Win Long Battle

Muncie, Ind., bus operators recently won a long legal battle with the Union Traction Company of Indiana when the Supreme Court of Indiana denied the petition for a rehearing asked by the railway company and made permanent an order restraining the Circuit Court at Anderson, Ind., from imposing fines on the bus operators for contempt.

The railway company, independent bus lines and the city have been in a three-cornered legal fight in numerous

courts for nearly three years, the fight being filled with injunctions of assorted kinds, court decisions, ordinances, public service commission orders and certificates, with the net result that the public passenger vehicles of all those involved have continued to operate in spite of all commands and counter-commands, and the further result that more buses are on the streets than are needed to care for the patrons.

New Rockford Company Would Oust Bus Concern

The Elgin, Belvidere & Rockford Railroad, Rockford, Ill., which has been granted a permit to operate bus lines between South Beloit and Elgin, Ill., is expected to take legal action seeking revocation of the permit held by the Royal Rapid Transit Company, which operates buses over the same route. The case will be followed with interest by traction line heads and bus operators throughout Illinois as a precedent for future relationship between traction and bus interests. The Illinois Supreme Court in a recent Joliet case indicated that traction or steam lines in any territory have first call upon the right to establish bus services in their territory and that coach lines are not favored in the field until the established companies relinquish their claim to bus service.

Anderson Company Appeals Bus Permit

Formal notice that an appeal will be taken from a recent order of the Indiana Public Service Commission granting a certificate of public convenience and necessity for an Indianapolis-Elwood bus line to Ovid N. Hesler of Elwood has been filed with the commission by Arthur W. Brady, receiver for the Union Traction Company at Anderson. The appeal will be made to the Circuit Court at Anderson.

Bus Replaces Stub Line

The Portland Electric Power Company, Portland, Ore., has installed one of its standard buses to take the place of the stub line that ran east from 82d Street and Sandy Boulevard to Park Rose. The railroad was constructed about nineteen years ago by a real estate firm to help develop its land holdings, and the realtors have operated it up to the present time. It was recently decided by the County Commissioners that Sandy Boulevard should be widened east of 82d Street; this necessitated either the paving of the right-of-way or abandoning the whole proposition. The paving and maintenance would be too great, so it decided to turn it over to the Portland Electric Power Company, which will remove the tracks and maintain the bus service. The rate of fare is the same as before, except that employees' tickets will be good on this bus the same as in other parts of the city.

Purchase of West Virginia Lines Announced

Bus lines between Morgantown and Uniontown and Morgantown and Laurel Iron Works, on Lake Lynn, were purchased by the Monongahela Transport Company, subsidiary of the Monongahela West Penn Public Service Company, on Oct. 4. The lines were purchased from Frankhouser and Clark, Morgantown men, who have operated them for some time, and the purchase included considerable equipment, which will be added to the company's garage facilities. Operation of the lines will be under the supervision of Bailey A. Hupp, superintendent of the subsidiary company.

Buses May Replace Cars on Line in Toledo

The Toledo, Ohio, City Council voted to remove the entire tracks on Indiana Avenue between Washington Street and Brown Avenue except the downtown loop—following a four-year fight on the matter, during which time sentiment of property owners and car riders changed considerably. The removal of the tracks will make possible the repaving of the street.

The plan is regarded favorably by the Community Traction Company, as it removes an old parallel line in a territory adequately served by other lines. However, the railway company may put on auxiliary bus service in the district if it is required.

Lawton-Fort Sill Railway Gives Up in Favor of Buses

The Lawton-Fort Sill Street Railway, built in 1914 to connect Fort Sill and Lawton, Okla., ceased operation on Oct. 15. The project will be abandoned until the system is refinanced from fresh capital, it was said. Bus lines running between Lawton and the military post will succeed the cars. During the war the railway carried capacity loads of soldiers. Of late years the cars have been patronized only by a few. The line has not been able to earn a return for its owners for several years.

ORANGE LINES REPORTED SOLD.—The Orange Coach Company, operator of nine buses between Maplewood, N. J., and New York City, is reported to have been sold to the Public Service Transportation Company, Newark, a subsidiary of the Public Service Corporation of New Jersey.

TO EXTEND SERVICE TO BEACH.—The Connecticut Public Utilities Commission has ordered the Connecticut Company to supply bus service to the residents of Sound Beach. To accomplish this the company will have to extend its bus line from Laddin's Rock Corner to Adam's Corner. It was recently granted permission to discontinue railway service in this section.

Financial and Corporate

Partial Abandonment in Loop Authorized

Permission to abandon its rails and service for four blocks in the loop to the Burlington and Union Pacific passenger station in Lincoln, Neb., was granted the Lincoln Traction Company recently by the Nebraska Railway Commission. Although the company had asked for complete abandonment of the loop the commission held that as the present type of bus was impractical to handle travelers with hand baggage the company would have to continue to send a shuttle car and one of the Summer cars there on a ten-minute service. It was because of a large expenditure needed to bring the cars and paving to grades to correspond to those of the railroad station being completed that the company sought this abandonment.

Jitney Elimination a Factor in Increased Revenues in Savannah

Receipts of the transportation department of the Savannah Electric & Power Company, Savannah, Ga., for the year ended Dec. 31, 1926, were \$813,500. Revenue from both railway and bus operations increased 20.6 per cent. Approximately two-thirds of this was the result of the elimination of jitneys, which ceased operation on Jan. 1, 1926. This was the opinion of Howard C. Fils, president of the company, expressed in his annual report to the stockholders. The balance of the increase could be attributed to the growth of the community.

Operating statistics for 1926 compared with 1925 showed 113 passenger cars in service in 1926, and the same number in 1925; miles of track 62.6 in 1926, and 63.7 in 1925. Buses operated last year numbered four against three in 1925. There were 11,861,659 passengers carried in 1926 against 9,845,761 in 1925. No separate statement covering railway operation in detail was obtained in the announcement to the press on which this account is based.

First Kansas City Dividend

The Kansas City Public Service Company, Kansas City, Mo., has declared an initial dividend of \$1.75 a share on series A preferred stock. Voting trustees have fixed Oct. 31 as the record date for certificate holders entitled to the dividend, which will be distributed on Nov. 10.

Save Hocker Line from Junkpile

The Hocker line, known officially as the Kansas City, Lawrence & Topeka Electric Railroad, has been saved from the junkpile. At a meeting of 66 residents of communities along the line, in the Shawnee rural high school in Merriam, Kan., Oct. 20, it was agreed that the residents would raise \$35,000 by Jan. 5, 1928, to purchase the road from the Sonken-Galamba corporation. In addition to the payment of \$35,000, the Sonken-Galamba interests will accept \$1,000 in stock in the line. Service, which was suspended on July 31, will be resumed within 60 days.

Committees have been named to raise funds for purchasing the line. Subscriptions will be taken from residents of Shawnee, Merriam, Rosedale, South Park and other communities bordering the Hocker line. Articles of incorporation will be filed at the state Capitol at Topeka for the formation of a stock company with the raising of money for the purchase of the controlling interest in the line. It was planned during the meeting to vote a subsidy of township

bonds to repay the subscription raised to purchase the electric line. In case it does not pay for its operation the plan is to place bonds on the market and induce outside capital to finance the road's operation.

The Kansas City Public Service Company will operate the Hocker line for residents at 25 cents per car-mile. The agreement to be made with the Kansas City Public Service Company is termed a sympathetic one in order to allow residents a tram outlet to Kansas City and at the same time to act as a feeder to local city lines of the Kansas City Public Service Company.

Interborough Surplus \$9,362,346

Earnings statement for year ended June 30 shows increase in gross revenue and operating expenses with drop in net corporate income

GROSS operating revenue of the Interborough Rapid Transit Company, New York, N. Y., for the year ended June 30, 1927, was \$63,316,088, compared with \$61,708,814 last year, a gain of \$1,607,273, the result of a gain on the subway division of \$1,152,761, and a gain on the Manhattan railway division of \$454,512. The gain in the revenue from the transportation of passengers was \$2,158,080 and the loss in the other street railway operating revenue \$550,807, principally from advertising, which shows a decrease of \$597,191.

Operating expenses with maintenance and depreciation included on the basis of contractual provisions were \$35,575,666, compared with \$33,540,813 last year, an increase of \$2,034,853, the re-

sult of an increase of \$1,207,890 on the subway division and an increase of \$826,963 on the Manhattan railway division.

The net operating revenue was \$27,740,422, compared with \$28,168,001 last year, a decrease of \$427,579, the result of a loss on the subway division of \$55,129 and a loss on the Manhattan railway division of \$372,450.

The total amount of taxes was \$3,506,823, compared with \$3,350,783 last year, an increase of \$156,040; the subway division shows an increase of \$162,323, while the Manhattan railway division shows a decrease of \$6,283, or 0.26 per cent.

Income from operation was \$24,233,600, compared with \$24,817,219 last year, or a decrease of \$583,619, the result of a loss on the subway division of \$217,452, and a loss on the Manhattan railway division of \$366,167.

Non-operating income was \$257,176, against \$276,980 last year, a decrease of \$19,804, the result of a decrease on the subway division of \$10,278, and a decrease on the Manhattan railway division of \$9,526.

Gross income was \$24,490,775, compared with \$25,094,198 last year, a decrease of \$603,423, the result of a loss on the subway division of \$227,730, and a loss on the Manhattan railway division of \$375,693.

Income deductions were \$21,540,066, compared with \$21,669,158 last year, a decrease of \$129,092.

The net corporate income was \$2,950,709, compared with \$3,425,040 last year, a decrease of \$474,331.

Some \$11,657,966 was spent during the year for maintaining the railroads, power plants and the rolling stock. This amount was \$1,479,821 in excess of the contractual provisions and when de-

COMPARATIVE INCOME ACCOUNT OF INTERBOROUGH RAPID TRANSIT COMPANY

Year Ended June 30	1927	1926
Gross operating revenue...	\$63,316,087	\$61,708,814
Operating expenses.....	35,575,665	33,540,812
Net operating revenue..	\$27,740,422	\$28,168,001
Taxes.....	3,506,822	3,350,782
Income from operation..	\$24,233,599	\$24,817,218
Non-operating income....	257,175	276,979
Gross income.....	\$24,490,775	\$25,094,198
Income deductions.....	21,540,066	21,669,158
Net corporate income...	\$2,950,708	\$3,425,040
Add:		
Surplus at beginning of year.....	\$4,968,768	\$1,529,863
Profit and loss account— —net changes during the year*.....	1,442,868	13,865
Totals.....	\$6,411,637	\$1,543,728
Surplus at end of year. †	\$9,362,346	\$4,968,768

* Due principally to adjustment of subway division federal income tax accruals for years 1917 and 1918.

† Stated exclusive of accruals under Contract No. 3 and related certificates payable from future earnings and exclusive of expenditures for maintenance in excess of contractual provisions.

ducted from the net corporate income leaves a balance for the year of \$1,470,888, compared with \$2,443,695 the previous year.

The number of passengers carried was 1,173,646,256, compared with 1,130,484,647 last year, an increase of 43,161,609,, the result of a gain on the subway division of 30,346,523 and a gain on the Manhattan railway division of 12,815,086.

The cost of transportation, which includes the cost of power station coal during the year, was \$1,495,720 more than the previous year. Of that amount \$967,876 is incident to the strike of July, 1926, leaving an increase in the ordinary transportation expenses of only \$527,844 for the year, notwithstanding the operation of 3,553,834 additional car-miles and an increase of 5 per cent in wages effective April 1, 1927.

A net expenditure of \$1,425,160 was made during the year for additions, betterments and replacements. This amount includes the company's contribution toward construction and equipment under Contract No. 3 and the related certificates, as well as additions thereto.

The system is made up of 388 miles of single track, of which 249 is subway division, built under Contract Nos. 1 and 2, extension to 148th Street, and Contract No. 3, and 138 comprises the total Manhattan division.

The comparative income account for the years ended June 30, 1927, and 1926, is shown on page 841.

Abandonment of California Branch Line Authorized

Permission has been granted by the Railroad Commission to the Key System Transit Company, Oakland, Cal., to abandon operation of its San Lorenzo branch line between the junction of said branch line with the Oakland-Hayward line and San Lorenzo junction. The applicant showed that the earnings of this line have averaged \$220 a month, while the cost of operation has been approximately \$1,035 a month, a loss that the utility cannot continue to absorb.

Net of New York & Queens County Railway Increased

The New York & Queens County Railway, Long Island City, N. Y., reports earnings as shown in the following table:

Results for Calendar Years:			
	*1926	*1925	*1924
Revenue from transportation.....	\$669,811	\$687,512	\$696,898
Other street railway operating revenue.....	114,904	160,351	19,961
Total.....	\$775,715	\$847,863	\$716,859
Operating expenses.....	626,804	687,939	580,181
Taxes.....	33,156	35,921	39,401
Income from operations.....	\$115,755	\$124,004	\$97,277
Non-operating income.....	6,809	5,055	2,665
Gross income.....	\$122,563	\$129,059	\$99,942
Interest deductions—unpaid taxes.....	2,452	8,749	16,297
Other rent deductions.....	3,097	9,841	11,542
Net corporate income.....	\$117,013	\$110,469	\$72,103

* Receiver's operations only.

Balance of \$1,011,383 in Denver

The statement of earnings and expenses of the Denver Tramway Corporation and the Denver & Intermountain Railroad (with intercompany transactions eliminated) and direct debits and credits to surplus for the twelve months period ended Dec. 31, 1926, is as follows:

Total operating revenue.....	\$4,565,251
Less operating expenses and taxes:	
Operating expenses (not including depreciation).....	2,452,131
Taxes.....	543,029
Total operating expenses and taxes..	\$2,995,160
Net operating income.....	\$1,570,090
Total miscellaneous income.....	54,497
Gross income less operating expenses and taxes.....	*\$1,624,588
Deductions from income:	
Interest of underlying bonds.....	249,959
Balance.....	†\$1,374,629
Interest on general and refunding bonds	322,175
Balance.....	\$1,052,454
Less net profit and loss charges (including \$40,750 appropriated to Insurance Fund to enable corporation to carry part of its fire insurance)....	41,071
Balance available for depreciation and for dividend requirements on 104,164 shares of preferred stock..	\$1,011,383
* Equals 6.50 times interest on underlying bonds.	
† Equals 4.27 times interest on general and refunding bonds.	

Engineers Public Service Increases Directorate

Frank L. Babbott and Edwin S. Webster, the latter president of Stone & Webster, Inc., have been elected additional directors of Engineers Public Service Co., Inc., increasing the directorate to nineteen members. Mr. Webster was one of the original directors, but resigned just before taking an extended trip abroad.

The Engineers Public Service Company controls various utility corporations, including electric railways, under executive management of Stone & Webster.

Deficit in Portland, Me., Continues

For the year ended Dec. 31, 1926, the gross income of the Portland Railroad, Portland, Me., leased by the Cumberland County Power & Light Company, was \$1,402,767, compared with \$1,451,902 for 1925. Operating expenses and taxes were \$1,183,031, against \$1,178,574 for the year previous. A deficit of \$27,862 is compared with a net income of \$25,730 in 1925. After the consideration of dividends, operation in 1926 re-

sulted in a deficit of \$127,812, against deficit of \$74,220 in 1925.

The annual statement to the stockholders says that in spite of the increased deficit from the operation of the railroad property the company's earnings for the year showed an increase for dividends after deduction of \$370,200 for depreciation reserve, of which \$120,000 was applicable to the railroad property.

Would Abandon California Line

The Central California Traction Company has applied to the California Railroad Commission for permission to abandon its Sunnyside line from the intersection of Cherokee Lane to the intersection of Park and Ophir Street in the city of Stockton. It is the claim of the company that the revenue from that line is inadequate to pay the expense of operation.

Interstate Would Sell Common Stock

In a petition filed with the Indiana Public Service Commission the Interstate Public Service Company, Indianapolis, Ind., asked authority to issue and sell 3,333 shares of no par value common stock to raise approximately \$250,000 for refunding purposes. The securities issue is sought in connection with the purchase of the New Albany Street Railway on Oct. 30, 1925, and is also intended to reimburse the Interstate treasury for money applied to refunding bonds that fell due Aug. 1, 1927.

Oregon Line Buys Steam Property

The Portland Electric Power Company bid in the Willamette Valley Southern Railroad for \$272,000 at public sale on Oct. 17. There was a judgment for \$1,000,000 held against the railroad for power, materials and work furnished in the last twelve years. The Portland Electric Power Company will continue to operate the railroad as usual for passenger service between Oregon City and Molalla and for operations with the Eastern & Western Lumber Company.

London Shareholders Ratify Conversion Plan

Speyer & Company have been advised that the shareholders of the Underground Railways, London, England, have ratified the readjustment plan whereby holders of 6 per cent income bonds are to receive the option to convert their bonds into fully paid £1 ordinary shares of the company.

The plan provides that the bonds may be converted at any time before July 1930, at the rate of £1 fully paid ordinary share for every £1 1s. face amount of bonds. Income bonds may be deposited in New York for the exercise of the conversion privilege.

COMPARATIVE STATEMENT OF THE OPERATING RESULTS OF THE LONDON UNDERGROUND GROUP, YEAR 1926, COMPARED WITH 1925

	Railways		London General Omnibus Company, Ltd.		Total	
	1926 £	Increase £	1926 £	Increase £	1926 £	Increase £
Price receipts, after the operation of the common fund under the terms of the London Electric Railway Companies' facilities act agreement, dated Dec. 21, 1915, and supplemental agreement, dated Dec. 8, 1921.....	4,825,914	226,297	8,371,713	272,322	13,197,627	46,025
Expenditure.....	3,007,896	168,114	7,998,915	249,558	11,006,811	81,444
Price receipts.....	1,818,018	58,183	372,798	22,764	2,190,816	35,419
Miscellaneous receipts (net).....	537,699	33,447	389,411	59,519	927,110	92,966
Net income.....	2,355,717	91,630	762,209	36,755	3,117,926	128,385
Interest, rentals and other fixed charges.....	1,222,620	116,399	234,335	20,011	1,456,955	136,410
Balance.....	1,133,097	24,769	527,874	16,744	1,660,971	8,025
Appropriation to reserve for contingencies and renewals.....	155,000		325,000	25,000	480,000	25,000
Balance.....	978,097	24,769	202,874	8,256	1,180,971	33,025
Dividends on guaranteed and preference stocks.....	389,477				389,477	
Balance.....	588,620	24,769	202,874	8,256	791,494	33,025
Adjustment from last year's accounts.....	257,673	9,286	67,501	6,999	325,174	16,285
Amount available for dividends on ordinary stocks and shares and for other purposes.....	846,293	15,483	270,375	1,257	1,116,668	16,740
Dividends on ordinary stocks and shares.....	604,103		206,250	2,119	810,353	2,119
Rate per cent per annum.....	3.54		(Free of tax)		4.09	
Balance carried forward to next year's accounts.....	242,190	15,483	64,125	3,376	306,315	18,859

London Underground Railways and General Omnibus Company Report Year's Operations

London underground railways lost 9,000,000 passengers last year despite the fact that 7 additional route-miles were opened for traffic in September. Report of the last annual joint convention of the London Underground Railways and the General Omnibus Company as reviewed by Lord Ashfield, Feb. 24, showed that there was an increase in bus traffic of 13,000,000 passengers; this increased carriage was provided for by 59 additional miles of road. During the year 112 additional cars were purchased for the tube railways. Operation costs per mile on railways has been reduced 1 1/2 per cent, while cost of bus operation amounted to 3 1/2 per cent reduction. The combined companies have obli-

gated themselves to spend £25,000,000 on improvements and extensions since the year 1918.

Expenditures influencing the cost of operation were, according to the report, costs of coal, amounting to £144,000; £57,000 was incurred during the general strike; loss of £339,000 was due to labor troubles, and the burden of taxation, which included £400,000, compared to £330,000 the preceding year. Contribution of seven-tenths of a penny now is paid for every mile run by buses, including also the company's share of road maintenance. Burdens laid by Parliament on this group of companies last year amounted to £711,000, equal to 5 per cent of the gross receipts and to 88 per cent of the amount distributed in dividends on ordinary stocks. Of this sum, £589,000 was required to meet taxation in the strict sense. The balance was represented by contributions toward

health, pensions and unemployment. About one-fifth of the amount distributed in dividends had to be paid in income tax, so that the ordinary shareholders received not more than £648,000, while the government received £751,000.

Bus service was restricted last year because of the order of the Ministry of Transport to withdraw 45 buses from its main routes. These buses, however, have been put in operation on routes new and not much used. Of all the routes worked in 1926, 87, or 29 per cent, did not earn sufficient to pay expenses including depreciation and renewals. The company also has acquired controlling interests in several of the smaller lines and is gradually consolidating them.

Operating data on the London Underground group are shown in the accompanying statements.

MISCELLANEOUS STATISTICS OF LONDON UNDERGROUND GROUP, YEAR 1926, COMPARED WITH 1925

	Total Railways		London General Omnibus Company, Ltd.		Total	
	1926	Increase	1926	Increase	1926	Increase
Passengers carried:—						
Ordinary.....	210,470,208	7,444,288	1,249,353,228	12,805,475	1,459,823,436	5,361,187
Workmen.....	50,580,564	836,422			50,580,564	836,422
Seasons.....	48,727,502	642,856			48,727,502	642,856
Total.....	309,778,274	8,923,566	1,249,353,228	12,805,475	1,559,131,502	3,881,909
Average daily number of passengers carried.....	921,573	21,322	3,712,788	54,363	4,634,361	33,031
Route-miles owned or leased†.....	M. Ch. 78 62	M. Ch. 6 59	M. Ch.	M. Ch.	M. Ch. 78 62	M. Ch. 6 59
Route-miles run over by companies' trains.....	128 22.5	6 59	860 0	59 0	128 22.5	6 59
Route-miles run over by company's omnibuses.....					860 0	59 0
Number of stations.....	125	7	44	1	125	7
Number of garages.....	171	14			171	14
Number of lifts.....	63	23			63	23
Number of escalators.....	65,398,129	38,584	138,784,175	5,159,026	204,182,304	5,197,610
Number of car-miles run in relation to passenger receipts.....	72,307,654	563,983	138,784,175	5,159,026	211,091,829	5,723,009
Number of car-miles run by companies' trains or omnibuses.....	1,770	182	*3,935	201	5,705	19
Number of cars or omnibuses owned.....						

† Includes 12 miles 49 chains run over the City & South London Railway (Fulton to Morden).
 ‡ Includes 15 miles 48 chains run over the London Electric Railway (Kensington and Euston to Edgware and Highgate).

* The number of omnibuses owned and/or worked by or in conjunction with the London General Omnibus Company, Ltd., is 4,703, compared with 4,704 in 1925. Italics denote decrease.

Personal Items

A. C. Baker and T. Rowland Visit America

Two keen students of electric railway and bus transportation have completed a thorough study in this country of modern methods and equipment. They are A. C. Baker, chief engineer of the Birmingham Corporation Tramways, Birmingham, England, and his assistant, T. Rowland. These distinguished representatives of a large English tramway system arrived in New York on Oct. 1 and went immediately to Cleveland to attend the American Electric Railway Association convention. There they expressed themselves as much interested in the cars and buses that were on exhibition. While in Cleveland they also made an extensive inspection of the Cleveland Railway.

From Cleveland they went to Detroit, where under the direction of Charles F. Hewitt, staff engineer of the Detroit Municipal Railway, they inspected the cars and the buses in operation and studied the system of traffic control. Their next objective was Chicago, where they visited the shops of the Chicago Surface Lines and the Chicago Rapid Transit Company, as well as the Chicago Motor Coach Company's plant. Next on their route east they visited Buffalo and Boston and returned to New York on Oct. 18. In New York they studied railway and bus operation and as guests of L. H. Palmer, general manager of the Fifth Avenue Coach Company, they visited the new Holland Vehicular Tunnel from New York to New Jersey. Later they visited Philadelphia.

Martin Ackerman with Peoples Railway

Martin Ackerman has been appointed manager of the Peoples Railway, Dayton, Ohio, under control of the American Electric Power Company of New York, effective Oct. 17. Stevens & Wood are operating managers of this property.

Early in 1926 Mr. Ackerman, who was serving as general manager of the Cincinnati & Dayton Traction Company, resigned to become general manager of the Lake Shore Electric Railway, with headquarters at Sandusky. At that time the *ELECTRIC RAILWAY JOURNAL* commented upon the fact that Mr. Ackerman was returning to take charge of the property on which he had obtained his early electric railway experience. There he had served as a shop man and then as a trainman. In time he advanced to the positions of train dispatcher and trainmaster.

Early in his career Mr. Ackerman became connected with the Youngstown & Ohio River Railway, originally a steam line running between Washington and Salem, Ohio. Some four months

later he assumed the general management of the Springfield & Xenia Railway. He continued with this property, making it a paying proposition, which it had not been prior to his supervision, until 1914, when he took over the operation of the Interurban & Terminal Company of Cincinnati as general superintendent. He seemed to have the knack of converting losing ventures into paying ones, for here too a surplus in earnings was reported. Although this healthy condition did not last, due to war-time handicaps, his reputation had been made and he received the appointment of general manager of the Cincinnati & Dayton Traction Company in July, 1918.



Martin Ackerman

In the face of hard times and subsequent operation under a receivership Mr. Ackerman carried on and did a great deal to restore a property which was fast making for the rocks. The company has since been reorganized with a cut in debt from \$4,900,000 to \$1,300,000. He helped to pave the way for this happy result.

L. V. Sutton Promoted to Post in Mississippi

L. V. Sutton, former assistant manager of the Arkansas Power & Light Company, Little Rock, Ark., has been promoted to the position of vice-president and general manager of the Mississippi Power & Light Company. He has started on his new duties at Jackson, Miss. Mr. Sutton went to Little Rock in August, 1924, from Raleigh, N. C., where for twelve years he had served the Carolina Power & Light Company. Before that time he was connected with the General Electric Company at Lynn, Mass.

Mr. Sutton was born in Richmond, Va. He was graduated from the Virginia Polytechnic Institute, where he had majored in electrical engineering.

The Mississippi Power & Light Company operates 12 miles of line in Jackson, Miss., and 11 miles in Vicksburg.

This company and the Arkansas Power & Light Company are controlled by the Electric Power & Light Corporation, New York, N. Y.

A. R. Koonce and Rex I. Brown Promoted in Arkansas

Some of the duties of L. W. Sutton, who recently left Little Rock, Ark., to assume new duties as vice-president and general manager of the Mississippi Power & Light Company, Jackson, Miss., will be undertaken by A. R. Koonce, superintendent of the Little Rock railway department of the Arkansas Power & Light Company. Mr. Koonce has been made general superintendent in direct charge of the railway department and will act in an advisory capacity for the Pine Bluff Railway system.

Twenty-six years ago Mr. Koonce entered the employ of the local railway company as a blacksmith's helper. He advanced through the various positions of night foreman, day foreman and master mechanic until in 1918 he was made superintendent of the railway department.

Vice-President Griffith, who gave Mr. Koonce his first position with this property, said that both he and R. I. Brown, who will cover the other duties of Mr. Sutton in the electric end of the business, were deserving of the promotion. Mr. Brown, who has been made assistant to Vice-President C. J. Griffith, directly in charge of the electric department, will continue his duties as commercial manager, as will Mr. Koonce continue in his present position in addition to taking on new duties.

A. W. McLimont Honored on Decade of Progress

To honor his ten-year service record with the Winnipeg Electric Company as general manager, a complimentary dinner was tendered to A. W. McLimont, president, by the supervisory employees of the company on Oct. 1. The dinner was held in the Royal Alexandra Hotel, Winnipeg, and was attended by the local directors. Speeches sketched the history of the Winnipeg Electric Company over the past ten years, indicating its progress in the capable hands of Mr. McLimont. Later Mr. McLimont was presented a silver loving cup as an expression of esteem by the members of his organization.

In addressing the happy gathering Mr. McLimont said that there were three outstanding factors which had to be considered in connection with every problem which presented itself. The first one was public relations; second capital, and, third, loyal labor. He said he believed the company today was on the threshold of a great development that the growth of the company mirrored very clearly the future of the community. It was his desire that every employee should assist "in getting and maintaining the confidence of the public

serve—as well as capital and labor—in our good intentions.”

The occasion for honoring Mr. McLimont recalled to mind the comment on his progressive policy in big business which appeared in an article appreciative of Mr. McLimont in the *Canadian Financial Post* for June 24. His averting a threatened strike of the trainmen was said to be only one of the big steps he had taken in putting the company on a sound basis.

When Mr. McLimont was induced to go to Winnipeg the Winnipeg Electric Company was in a dangerous state of

disorganization, confronted with labor troubles, producing no dividends, hampered by the provisions of an old franchise and its equipment in need of repairs and replacements. The hardest job was getting the old franchise adjusted on an equitable basis since the old franchise made no provision for the necessary increase in revenue. The adjustment was accomplished and then he set about the task of rearranging the company's labor program. His endeavors to make the organization satisfactory to the company, the men and the city, have met with no little success.

had hitched his wagon to a star. He saw clearly—and, more important, journalistically—the place that the bus was to play in the transportation industry, appraised accurately the need for better public relations and for merchandising the service, and recognized that it was essential to modernize both railway plant and operation methods. In all he served the McGraw-Hill Publishing Company, Inc., ten years, starting as an editorial apprentice in the capacity of assistant editor *Electrical World* in 1915.

For two years after he was graduated from the University of Michigan and before taking up editorial duties he was engaged in engineering work with the Aurora, Elgin & Chicago Railroad and the Chicago Telephone Company. During the war he was first lieutenant and captain in the Signal Corps. He was born in Grand Rapids 38 years ago.

Many men prominent in the industry telegraphed expressions of sympathy to Mansfield.

E. F. Wickwire, vice-president Ohio Brass Company, voiced the sentiment of the other officers, directors and associates of Mr. Brown in the following words:

Expressions that have poured in from Harry Brown's host of friends testify eloquently to the magnitude of the loss which his passing occasioned. The sense of loss is doubly strong in us who have been so close to him.

Of him Lucius S. Storrs, managing director of the American Electric Railway Association, said:

It is difficult for me to realize that Harry L. Brown has passed on. Only yesterday he was applying his seemingly indefatigable energy to making the American Electric Railway Association convention a success. And only the day previously, it seems, he was using his great editorial ability in fighting for the progressive things in local transportation. He will be missed wherever local transportation exists, because everywhere in it there are forward steps directly traceable to his efforts. But most of all he will be missed as a charming and congenial friend.

J. W. Welsh, secretary of the American Electric Railway Association, said:

I came to know Harry Brown rather intimately as a member of the association's committee on foreign operation that studied transportation problems in Europe in 1924. He was a keen observer. He had a clear appreciation of relative values and a happy way of expressing himself in his writings. For years he has been an active worker in the association and has been a member and chairman of its most important committees. He was a leader among those who were thinking along modern and progressive lines. His loss will be very keenly felt.

James H. McGraw, president of the McGraw-Hill Publishing Company, Inc., publisher of the *ELECTRIC RAILWAY JOURNAL*, said:

Harry L. Brown, in addition to his personal charm and rare ability, had many of the qualities of leadership. He did not shy at a new idea. Still more important, he never counted the cost to himself of the work involved in carrying out any project upon which he launched. His work in journalism, exacting as it was, proved this, as well as did his work in other lines, par-

Harry L. Brown

Secretary of Ohio Brass Company and former editor of "Electric Railway Journal" died at Toledo on Oct. 23—Long a constructive force in industry and active association worker

HARRY L. BROWN, secretary of the Ohio Brass Company and formerly editor of the *ELECTRIC RAILWAY JOURNAL*, died at Toledo, Ohio, on Oct. 23. He was stricken with appendicitis while returning home to Mansfield after attending the Ohio-Michigan football game at Ann Arbor, and did not recover from the shock of the operation which it was deemed necessary to perform at once.

Harry Brown, as he was familiarly known, was a constructive force in the electric railway industry. This was true of his work as a member of the staff of the *ELECTRIC RAILWAY JOURNAL*, later as editor of this paper, and still later as an officer of the Ohio Brass Company. It is putting no strain on facts to say that he was a brilliant man. A brilliant man is ever aggressive—his mentality compels him to action. While he grapples friends to him with hooks of steel, he is very likely to be misunderstood by those who do not know him well and are given to judging superficially. It fell to Harry Brown's lot to be so judged on occasion because of his militancy as a journalist, but he and the paper he served had the satisfaction of seeing improvements made and of witnessing the carrying out of plans which the paper advocated.

The man had about him the air of the natural doer of deeds. He had small patience with mediocrity, and he despised complacency, neither of which has any place in the general scheme of things, at least of all in journalism. If it be a fault to be intolerant of these humanly pernicious failings, then Harry Brown had that fault, but there was nothing hypercritical about it. If he did not spare others in the tasks which he allotted to them, he certainly did not spare himself. And never was that more evident than in his work as chairman of the subjects and meetings committee at the recent convention at Cleveland. Recognition of the ability of the man to get things done came to him again at the Oct. 6 meeting of the American Executive committee, which reappointed him chairman of the committee on sub-



Harry L. Brown

jects and meetings for the year 1927-1928. Of the important work that he did for the Ohio Brass Company perhaps the most conspicuous was his contribution to its publicity and advertising activities.

Great as was his service to the industry through his general activities in association affairs and in serving as a member of the American executive committee, none of the work of this kind that he did really overshadowed in its importance his contribution in 1924, along with Secretary Welsh and Harley Johnson, as a member of the committee on foreign practice. These men spread before the industry a summary of foreign practices with comment on the applicability of things being done in Europe for adoption in the United States. It was a difficult task done with celerity.

Conspicuous work by the man as Western editor of the *ELECTRIC RAILWAY JOURNAL* led eventually to the elevation of Harry Brown to its editorship on Jan. 1, 1923. As a field editor he

ticularly his activities in behalf of the American Electric Railway Association. In voicing my own sense of loss at his passing, I know that I express the sentiments of all the officers of the McGraw-Hill Publishing Company, Inc., and more particularly the sentiments of the members of the staff of the *ELECTRIC RAILWAY JOURNAL*, which he served loyally and faithfully. His was a constructive influence the industry can ill afford to lose.

Funeral services were conducted at his late home in Mansfield on Wednesday morning. The pallbearers were Messrs. Sawyer, Bozell, Wickwire, Mason, Jameson and Huntington. Later the remains were taken to the home of Mr. Brown's parents in Grand Rapids, Mich., where brief services were held Thursday morning. The interment was in the family plot at Fuller Cemetery, near Hastings, Mich. He is survived by his father, mother, wife and two children.

JOHN R. H. STALEY, right-of-way expert for the Public Service Company of Northern Illinois, died on Sept. 13 in Joliet, Ill., two years after his retirement from active duty. He went to Joliet 42 years ago and began as lineman for the old Economy Light & Power Company. Later he was advanced to superintendent, which position he held when the company was absorbed by the Public Service Company.

C. F. McELROY, instrumental in the organization of the Carthage Electric Railway Company, Carthage, Mo., which built and operated the Carthage to Cartersville line, died recently. He was secretary of the company and continued in that capacity until the consolidation of the line as a part of the Southwest Missouri Railroad. Mr. McElroy was 79 years old.

GEORGE ST. PIERRE, retired superintendent of equipment of the Key System Transit Company, Oakland, Cal., died recently as a result of injuries sustained in an auto accident in Walnut Creek, Cal., on Oct. 13. When he retired from the Oakland System in the spring of 1925 he had been connected with the local railway for 39 years. Mr. St. Pierre went to California from Montreal, where he served his apprenticeship as marine machinist.

PERLEY F. WALKER, dean of the School of Engineering of the University of Kansas, Lawrence, Kan., since 1913, committed suicide Oct. 17 in his office at the university. He was a national figure in engineering circles. Dean Walker was the author of "Management Engineering," published by the McGraw-Hill Book Company, and had contributed articles on various topics to the technical press. He served as president of the Society for the Promotion of Engineering Education in 1923-1924, was a past-president of the Kansas Engineering Society and a member representative of the American Society of Mechanical Engineers on the American Engineering Council. Dean Walker was born in Embden, Me., in 1875.

Manufactures and the Markets

Improvements of Over a Million by Altoona & Logan Valley

The Altoona & Logan Valley Electric Railway, Altoona, Pa., it is reported has completed a three-year program of track building, new car purchase and general improvement at a total cost of \$1,047,946, as follows:

The installation of new track, paving and drains under the tracks cost \$533,435; safety and efficiency equipment for street cars, \$45,376; thirteen steel-body, light-weight, double-truck safety cars purchased new, \$212,065; rebuilding three single-truck safety cars, \$13,464; substation equipment and distribution lines for power, \$74,867; a bridge construction job, \$42,794; conveyance, electric welders, telephone lines and signals, \$32,095; five auto buses, 21-passenger style, \$31,435; two other buses for use at Tyrone, \$12,469; two additional buses in use in Altoona, \$11,000, and the building of a new garage to house 25 buses, \$38,942.

Carolina Company Awards \$96,300 Contract for Carhouse

Contract for construction of the Carolina Power & Light Company's new carhouse in Asheville, N. C., has been awarded to the Palmer-Spivey Construction Company, Charlotte and Asheville, on a bid of \$96,300. The building is to be a two-story fireproof structure and will contain space for storage of the company's street cars and buses. Installation of track and other equipment for the structure will make the cost of the plant approximately \$175,000.

Basic Bessemer Process Dropped from British Rail Specifications

The British Engineering Standards Association has decided to remove all reference to basic bessemer process from specifications for bull-head and flat-bottom rails, the use of this process being no longer in accord with British practice.

Big Track Job Under Way by Los Angeles Railway

The engineering department of the Los Angeles Street Railway, Los Angeles, Cal., has started work on the renewal of a crossing at Macy and Alameda. It is also engaged in a complete reconstruction of track with 116-lb. girder rail on Pasadena Avenue between Avenue 18 and San Fernando Road. Work is now in progress, it is reported, on the largest track job which the company has ever undertaken, the complete reconstruction of track on San Pedro Street from Ninth to 36th Street. New

116-lb. steel girder rail will replace the old 60-lb. rail, with a view to providing more comfort for passengers and smoother riding. The roadbed is rock-ballasted with drain tile on both sides and 8-in. concrete paving with asphalt surface is used. The job will cost \$200,000.

General Electric Exhibiting Great Northern Electric Unit

The largest motor-generator type electric locomotive in the world, one of four being built by the General Electric Company for the Great Northern Railway for hauling passenger and freight trains through the new 7 $\frac{3}{4}$ -mile tunnel piercing the Cascade Mountains, is being exhibited during this month at cities along the Great Northern road. Some of the main specifications of these units follow:

Total weight.....	518,000 lb.
Weight on drivers.....	409,800 lb.
Length over couplers.....	73 ft. 9 in.
Length of wheel base.....	58 ft. 8 in.
Number of driving axles.....	6
Number of guiding axles.....	2
Diameter of driving wheels.....	55 in.
Diameter of guiding wheels.....	36 in.
Number of motors.....	6
Speed continuous rating.....	18.7 m.p.h.
Maximum speed.....	50 m.p.h.

Large New England Contract for English Electric Company

The English Electric Company has obtained a contract for complete electrification of the railway from Christchurch to Lyttleton, New Zealand, at a cost of about £100,000. The order includes 45 miles of overhead line material, six 1,500-volt locomotives of the four-axle type, 3 ft. 6 in. gage, each machine weighing 50 tons, and a substation plant. There is only one substation, and it is arranged for remote control. It will be supplied with three-phase current at 10,500 volts, 50 cycles.

G. E. Directorate Inspects Fort Wayne Plant

The entire board of directors of the General Electric Company was in Fort Wayne, Ind., Oct. 14 for a business meeting and an inspection of the Fort Wayne works of the company. Those attending were: Gerard Swope, president, of New York City and Schenectady; Jesse R. Lovejoy, New York, vice-president; George F. Morrison, vice-president, and Owen D. Young, chairman, both of New York; E. Wilbur Rice, Jr., honorary chairman, of New York and Schenectady; Oliver Ames, Gordon Abbott, Robert Treat Paine II, George P. Gardner, Philip Stockton, Francis L. Higginson, all of Boston; Marsden J. Perry, Providence, R. I.; Bernard E. Sunny of Chicago; Burton G. Tremaine of Cleveland; Mel-

v. T. Traylor of Chicago; Henry M. Robinson of Los Angeles; George F. Baker, Jr., Seward Prosser, Dwight W. Morrow and Clarence N. Woolley, all of New York City. Several of these men have visited the Fort Wayne works on previous occasions before, but this is the first time the entire board has assembled in the city.

Worcester's Railway Rehabilitation Program Shows Large Expenditure

The rehabilitation program of the Worcester Consolidated Street Railway, Worcester, Mass., has cost approximately \$1,510,848 in the first nine months of this year, according to officials of the company; it is reported. The New York, New Haven & Hartford Railroad, when it resumed control of the franchise, it is understood, promised to spend \$1,000,000 in rehabilitating the road. One of the major items of expense was the purchase of 50 new cars from the Osgood-Bradley Company of Worcester at a cost of \$708,550. A de-

scription of these units and the ceremony attendant upon the official demonstration trip of the first of them appeared in an article in the JOURNAL Oct. 1. All but three of these cars have been delivered.

The new carhouse at Grove Street, Worcester, will represent the expenditure of \$250,000 when completed and \$75,000 has already been spent in building a new garage for buses. Sixteen new buses have been purchased at a cost of \$149,500. Car route numbers have cost \$15,000. Other expenditures included a new automobile truck at a cost of \$4,800 and special line work \$18,164. On Oct. 1 \$209,834 had been spent for track construction, with the end of the program in this direction not yet in sight.

National Power Show Scheduled for Dec. 5-10

The sixth National Exposition of Power and Mechanical Engineering will be held at the Grand Central Palace, New York, from Dec. 5 to 10 inclusive, and at the same time as the exposition

is held the annual meetings of the American Society of Mechanical Engineers and American Society of Refrigerating Engineers will be held. Numerous other organizations will meet at the same time as the exposition; some of these will meet jointly with, or in bodies attend, the exposition.

Quiet Week in Metal Markets

The extreme activity in buying of copper and lead apparently ran its course last week and the week ended Oct. 26 has been a quiet one in the non-ferrous metal markets. Buying of copper has been particularly dull, whereas there was a little more activity in zinc than in the preceding week. Prices have tended toward lower levels, zinc suffering particularly in this respect.

The copper market has again relapsed into a condition of stagnation such as existed prior to the wave of buying that took place last week. As before, the leading producers are almost uniformly holding at 13.25 cents, at which level only scattering sales have been made and these in small tonnages. Export

Ten Units for Northern Texas Traction Company



Exterior of one of the ten units for the Northern Texas Traction Company

Specifications have recently been prepared by the Northern Texas Traction Company, Fort Worth, Tex., on ten one-man, double-end, city type, double-truck cars built by the St. Louis Car Company. The cars are of all-steel construction, 39 ft. 11½ in. over all, with a total weight of 35,000 lb. each, and designed to seat 50 passengers. One of the cars was exhibited at the Cleveland convention. General Electric No. 20 motors are part of their equipment. So joined are the specifications as sent to the JOURNAL by L. E. Thorne.



Interior view of one of the units built for the Northern Texas Traction Company

Number of units.....	10
Type of unit.....	One-man, motor, passenger, city, double end, double truck
Order of car body.....	St. Louis Car Co., St. Louis, Mo.
Date of order.....	April 25, 1927
Date of delivery.....	Aug. 31, 1927
Weight, total.....	35,000 lb.
Length over all.....	39 ft. 11½ in.
Length over body posts.....	26 ft. 5½ in.
Width over all.....	8 ft. 8½ in.
Height, rail to trolley base.....	11 ft. 0 in.
By.....	All steel
Refrigeration.....	Aireh

Air brakes.....	Safety Car Devices Company
Armature bearings.....	Plain
Axles.....	A.E.R.A. standard, 4-in. diameter
Car signal system.....	Faraday
Compressors.....	Westinghouse DH-16

Conduit.....	Cables in canvas hose
Control.....	K-75A controller, No. 98A cutout switch
Curtain fixtures.....	National Lock Washer Co.
Curtain material.....	Pantasote, double faced
Destination signs.....	Hunter illuminated
Door mechanism.....	National Pneumatic Co.
Doors.....	End, folding
Energy-saving device.....	Economy meters
Fare boxes.....	Johnson Pneumatic
Finish.....	Enamel Ripolin
Floor covering.....	Linoleum, green cork
Gears and pinions.....	G. E.
Glass.....	Non-shatterable
Hand brakes.....	St. Louis Car Co. No. 10558
Hand straps.....	Sanitary hand holts
Heaters.....	Consolidated type R
Headlights.....	E.S.S. Co., S.A.F. 95
Headlining.....	Askelite ½ in.
Interior trim.....	Mahogany finish
Journal boxes.....	Symington
Lamp fixtures.....	E.S.S. Co., dome type
Motors.....	Four G E-265, inside hung
Registers.....	International, type R
Roof material.....	Treated canvas
Sash fixtures.....	O. M. Edwards, bronze nickel plated
Seats.....	Hollywood-Wakefield, No. 327-M.S.
Seating material.....	Cleveland Tanning Co., Hyline train
Slack adjusters.....	Westinghouse
Steps.....	Folding
Step treads.....	Feralun, type A
Trolley catchers.....	Keystone No. 23154
Trolley base.....	O. B., form 4
Trolley wheels.....	Miller trolley shoes
Trucks.....	St. Louis Car Co., form E-1B-64
Wheels.....	26-in. rolled steel
Wheelguards.....	H. B. life guards

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

Metals—New York		Oct. 25, 1927
Copper, electrolytic, cents per lb.	.....	12.937
Copper wire, cents per lb.	.....	15.25
Lead, cents per lb.	.....	6.25
Zinc, cents per lb.	.....	5.90
Tin, Straits, cents per lb.	.....	58.50
Bituminous Coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....	\$4.175
Somerset mine run, Boston, net tons	.....	1.80
Pittsburgh mine run, Pittsburgh, net tons	.....	1.825
Franklin, Ill., screenings, Chicago, net tons	.....	1.575
Central, Ill., screenings, Chicago, net tons	.....	1.25
Kansas screenings, Kansas City, net tons	.....	2.30
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	.....	\$5.50
Weatherproof wire base, N. Y., cents per lb.	.....	16.00
Cement, Chicago net prices, without bags	.....	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	.....	10.2
White lead in oil (100-lb. keg), N. Y., cents per lb.	.....	13.75
Turpentine (bbl. lots), N. Y., cents per gal.	.....	\$0.52

sales have been made in reasonable volume at the association price of 13.60 cents, c.i.f., and at 13.35 cents, f.a.s.

A moderate business in zinc was done during the week, but at gradually declining prices. The market is established for the time being at 5.90 cents. Producers of high grade zinc quote 7.75 cents, New York, as against 8 cents, which they have held for several months. However, the price is purely nominal as the market is dead.

The continued weakening in the London lead market, which culminated Oct. 25 in a spot quotation of only £20 2s. 6d., put a quietus on buying in the United States, consumers evidently thinking a reduction in prices was in order. Middle Western producers did go back to 6 cents, St. Louis, but the American Smelting & Refining Company continued its contract price in New York at 6½ cents. On Oct. 26 some encouragement was felt in the advance reported from London, and from the good foreign demand that the lower prices of the week have developed.

A fair demand for tin for prompt shipment to consumers manifested itself during the week, but in general the market has been rather quiet at prices varying between 58 and 59 cents per pound for prompt Straits. Futures have been approximately half a cent lower.

ROLLING STOCK

NEW YORK STATE RAILWAYS, Rochester, N. Y., has ordered three White buses, Model 50-B, with 25-passenger bodies.

SHAMOKIN & TREVORTON BUS LINE COMPANY, a subsidiary of the Shamokin & Edgewood Electric Railway, Shamokin, Pa., has accepted delivery on a 25-passenger Mack city type bus, 196-in. wheelbase, with four-cylinder motors. This bus, it is reported, will replace railway equipment between Shamokin and Paxinos, a 4-mile route.

SAN DIEGO ELECTRIC RAILWAY, San Diego, Cal., announces the purchase of additional equipment to take care of the ever-increasing traffic on the existing bus routes and also for new exten-

sions recently added, including the bus service between San Diego-La Mesa and El Cajon, which added approximately 16 miles of bus route to the system. One A.C.F. six-cylinder, 31-passenger bus was purchased a few weeks ago and orders have recently been placed for an additional Fageol 31-passenger bus and also one of the new Twin-Coaches developed by Frank R. Fageol. These late acquisitions bring the total bus fleet operated on regular schedules to 21.

TWIN CITY MOTOR BUS COMPANY, subsidiary of the Twin City Rapid Transit Company, Minneapolis, Minn., is standardizing its buses with one-body models on Mack and White chassis. Between fifteen and twenty old buses will be replaced within a year, it is reported.

TRACK AND LINE

TRI-CITY RAILWAY, Davenport, Iowa, is engaged in track reconstruction work on Rockingham Road between Howell Street and Lincoln Avenue. The cost will be approximately \$12,500.

TRENTON & MERCER COUNTY TRACTION CORPORATION, Trenton, N. J., will extend its tracks about 2,000 ft. from Stuyvesant Avenue to the Hilltonia section.

WHEELING TRACTION COMPANY, Wheeling, W. Va., has commenced work on replacing the northbound tracks along Warwood Avenue between North Sixth and North Eleventh Streets.

SAN DIEGO ELECTRIC RAILWAY, San Diego, Cal., was recently reported as completing reconstruction of double track on Kettner Boulevard between Broadway and Market Street and north track on Market between Kettner and Atlantic Streets, comprising some 3,300 ft. of equivalent single track. This line was constructed in 1901 and serves the ferry service between San Diego and Coronado, and although 26 years old is reported to be still in excellent condition, not having handled very short headways. The new track is being built with the steel tie-concrete ballast type of construction, the standard adopted by this company for trackage in paved city streets, and is estimated to cost approximately \$50,000.

TRADE NOTES

C. J. MARTIN joined the forces of the National Pneumatic Company, Chicago, Ill., as mechanical expert in the Western territory, operating out of the Chicago office, effective on Sept. 1.

LONG MANUFACTURING COMPANY, Detroit, Mich., manufacturer of automotive radiators and clutches, has announced through J. L. Dryden the breaking of ground Oct. 1 for the first unit of its new factories, which will be located at Dequindre, corner of Hellick. The new unit will house the clutch division and power house and will be of

one-story brick construction, 128 ft. by 402 ft.

R. L. WILSON, works manager of the East Pittsburgh Works of the Westinghouse Electric & Manufacturing Company, has been made assistant to vice-president and general manager, and J. M. Hipple, manager of the company's motor engineering department, succeeded Mr. Wilson as works manager, according to a recent announcement by F. A. Merrick, vice-president and general manager.

J. J. HILT has been appointed sales manager of the Young Radiator Company, Racine, Wis. He was formerly connected with the Racine Radiator Company and its predecessor, the Perfex Radiator Company.

TIMKEN ROLLER BEARING COMPANY, Canton, Ohio, and M. B. U. Dewar of London, England, have, together, purchased from Vickers, Ltd., all of the capital stock of British Timken, Ltd. This purchase, it is understood, gives Timken complete control, throughout the world, of the manufacture and sale of Timken bearings. The Birmingham plant of British Timken, Ltd., is being enlarged. Officials of British Timken, Ltd., were reported as being at the Canton, Ohio, works making final arrangements for the immediate establishing of factories in France and Germany.

AMERICAN ENGINEERING COMPANY, Philadelphia, announces the appointment of R. H. McGredy as Philadelphia sales manager of the Lo-Hed Hoist Division of the company.

ADVERTISING LITERATURE

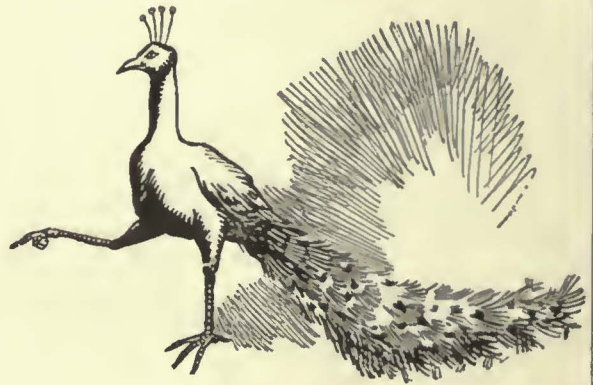
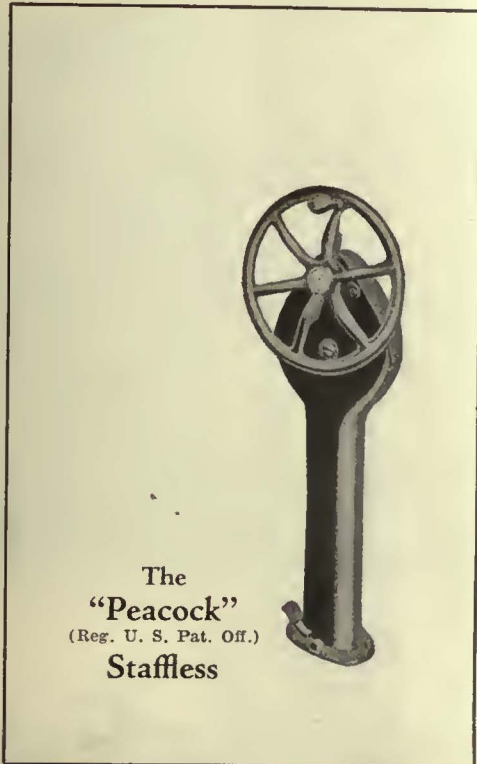
OHIO BRASS COMPANY, Mansfield, Ohio, is mailing a folder which presents the features of the O-B trolley wheels and harps.

PYROMETER INSTRUMENT COMPANY, New York City, has recently issued bulletin, No. 20, describing the construction and operation of "Pyro" radiating pyrometers.

CONDIT ELECTRICAL MANUFACTURING CORPORATION, Boston, Mass., has issued a folder announcing the Condit type F-20, with thermal control.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., is distributing fifteen-page pamphlet for looseleaf binding, entitled GEA-763, descriptive of induction motor panels, isolated type, 220, 440, 550 and 2,200 volts, 25 to 60 cycles, three-phase, non-grounded, three-wire for motor with wound or squirrel-cage motors. It is also distributing the same form literature dealing with station oil circuit breakers, type FHK-FKO, FHK and FHKO-236; static oil circuit breakers, type FK-230 and FHK-230.

W. E. CALDWELL COMPANY, Louisville, Ky., has recently distributed its 38th annual edition of its tank and boiler catalog. A complete line of tanks and towers is presented, with adequate explanatory notes.



Be insistent —and safe

THERE are many street railway executives—we will be glad to tell you of them—who insist upon Peacock Staffless Brakes as a final measure of safety in emergency equipment.

It is an insistent preference earned in the vast majority of cases by actual service—positive operation in the emergency—a report of an accident avoided instead of a crash.

Your hand brake equipment is always a timely topic. It is an excellent idea to arrange for tests. We have shown many railway officials how nearly useless the ordinary hand brake equipment is. And then by applying the same tests to Peacock Staffless Brakes—we leave the decision to any observer.

Peacock Staffless installation costs are moderate and the maintenance charges almost nil.

National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative: Lyman Tube & Supply Company, Limited, Montreal, Canada



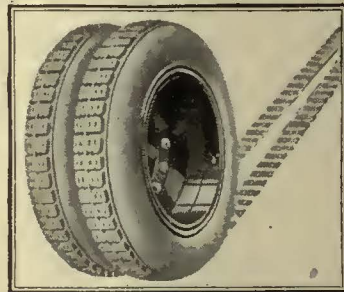
**“We are averaging
about
27,000 miles
to the set of tires” . . .**

SAYS G. T. Elliott of the Southern Coach Company, Greensboro, North Carolina, “and we know that we could not get this mileage if we were not using Budd Duals.

“During the past year we kept a close watch on all our buses. We have 12 Whites, 2 Commerce, and 1 Cadillac—all equipped with Budd Duals.

“Our records show that these buses have covered 85,000 miles a month—or over a million miles during the year without a wheel failure.”

POSITIVE PERMANENT ALIGNMENT



GREATER TIRE MILEAGE

100,000 buses and trucks are averaging from 15,000 to 20,000 miles to the set of tires on Budd Duals—

Because Budd Duals *always* run as true as an arrow—

They have no demountable rims, no rim clamps—So you can't get a tire on crooked.

This positive, *permanent* alignment is made possible by Budd Dual design.

BUDD Wheel Company
Detroit



40 *Seated Passengers*
40 COMFORTABLE STANDEES



AMERICAN CAR AND FOUNDRY MOTORS COMPANY
30 CHURCH STREET, NEW YORK

40 +40

Now - Greatly Increased Income without Proportionately Higher Cost

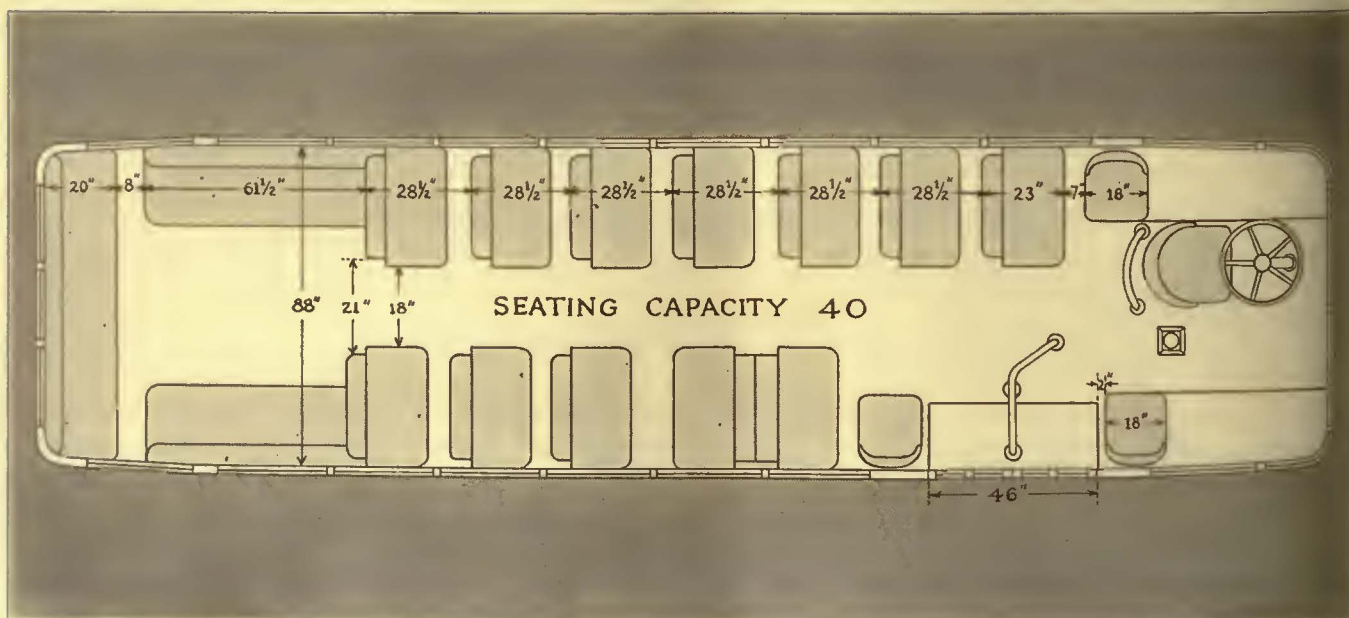
The Q. C. C. Metropolitan Coach seats 40 passengers in characteristic Q. C. C. comfort. 40 more passengers can stand comfortably without crowding. And the maximum loading is 100 revenue passengers. Now there is a motor coach to rival any other mass transportation equipment in ability to provide a high total of passenger-miles per vehicle-mile.

To achieve such highly desirable results Q. C. C. departs widely from conventional standards of coach designing. The all-steel structural framing, the floor plan, and the external appearance closely resemble modern rail passenger carriers. Q. C. C. mass transportation experience has made it possible to incorporate the most advanced ideas in rail-car building in a mobile unit.

On city lines, in densely populated areas, the conventional coach admittedly lacks capacity to profitably supplement rail service during peak-load periods. 25-passenger buses, for example, handle only 50 without undue crowding. And overcrowding always tends to turn away prospective passengers. The usual remedy of trippers to take the overload has frequently meant a disproportionately large investment in equipment, not justified by the net revenue available.

The Q. C. C. Metropolitan Coach will nearly double the number of seats and the standee space available at peak hours, without increasing the base schedule or the coach-mile expense. Hence ratio of income to operating expense can be radically improved.

Note particularly the driving position. This is behind the front axle, as in conventional coach design. Q. C. C. Metropolitan Coaches can be handled without special training and without constant alertness to special conditions.





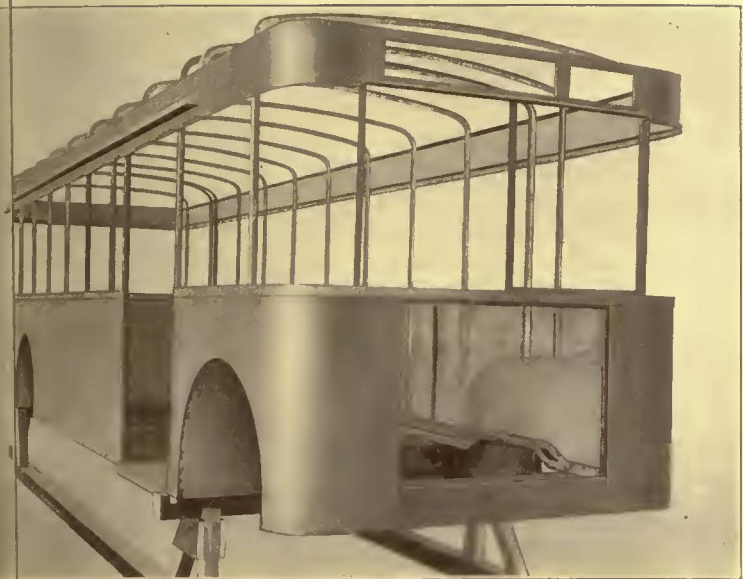
Except for the wheel housing the combination body-frame structure of Q. C. F. Metropolitan Coaches could hardly be distinguished from the best in modern street car design. The many pillars and deep top rail give extreme fore-and-aft stiffness. The deep all-steel side panels assure extreme rigidity throughout.

venient step and floor levels, while holding overall height within pleasing proportions.

Differing radically from the old automotive idea of a separate frame and body, the Q. C. F. Metropolitan Coach is made up of inter-related assemblies of steel members which simultaneously form frame and body structure. This unit structure rides on the axles and springs, which can be detached for overhaul, just as rail trucks are rolled out.

Increased revenue space is obtained, for practically every square foot of space is available within the body for passenger revenue. No longer is one-third of the street length given over non-productively!

Here is every requisite for profitable urban coach operation. The Metropolitan Coach plainly indicates how Q. C. F. mass transportation experience can always be marked up on your profit side.



All-Steel Body forms the Frame!

Stronger and More Spacious, with Rail-Car Life Expectancy

The Q. C. F. Metropolitan Coach has an all-steel *combined* frame and body. Structural strength comparable to that of all-steel railroad cars is now built into a motor coach by Q. C. F. The entire structural framing of the Metropolitan Coach contributes stiffest resistance to lateral and vertical deflection and distortion. The russ principle, exemplifying accepted practice in bridge building, is followed in this Q. C. F. construction. Advanced design secures adequate road clearance, con-



Three 7" steel channels act as sills, while deep stiff steel channels and angles comprise the floor beams. The T-shape pillars are also evident.

40
+40



Parlor Car Attractiveness

From its very fundamentals, to the very last detail, the Q. C. F. Metropolitan Coach brings the highest known standards of profitable mass transportation into the field of motor coach operation. The Transportation Department as well as the Operating Department will find all of their requirements met as never before.

There is no objectionable overhang of the

body. The turning radius is only 38 feet. Handling is facilitated by the amazingly easy steering which Q. C. F. engineers have developed expressly for this vehicle. The steering wheel of a passenger automobile turns no more easily. Traffic maneuvers, parking and storing can be accomplished with great saving of time and effort. Driver proficiency is maintained throughout working hours.



with Street Car Capacity

Without exceeding conventional coach length, the Q. C. F. Metropolitan Coach, 30 feet overall, provides 40 revenue seats and space for 40 to 60 additional standee fares. Load balance has been most successfully worked out. Wheel load is correctly distributed— with 80 passengers aboard, the load per tire is 400 pounds below manufacturer's rating.

Rapid loading and unloading are facilitated by

two air-operated double leaf doors. Incoming passengers are impelled slightly forward to the fare-box, and are separated from the outgoing line by a polished aluminum hand-rail.

The deep-cushion leather-upholstered seats each accommodate two passengers comfortably. Ample leg room is provided by the wide spacing and recessed seat-backs. The aisle width is 21 inches. Moving passengers

40 +40



Visibility, driving and door controls, and fare box position are scientifically worked out in accord with the most successful transportation practice.



The clear floor area attracts passengers and makes for faster handling under peak load conditions. Wide, deep-cushioned, leather-upholstered seats increase the riding habit.



and standees pass freely. The large open floor space at the rear entices standees rearward. Steadying handles are suspended from the roof.

Four large ventilators and an exclusive warm-air heating system assure comfort at all seasons. An interior capacity of almost 1,500 cubic feet, means

more than 35 cubic feet of air per seated passenger.

Windows are high enough to allow standees to observe street signs and landmarks, avoiding late rushes to alight. Glazing is Grade AA sheet glass, giving clear, undistorted vision. Sash are drawn brass with combination lifts and latches for convenience.

Ten 21 C. P. lamps with diffusing lenses afford ample illumination without shadow or glare. Recessed lights in step-wells contribute to greater safety.

Interior refinement has been carried far beyond previous urban coach practice. Ceiling finish is in white egg-shell lacquer, non-glaring and readily cleaned. Mouldings, pillar trim and car-card frames are mahogany finish. Below the sill-line, there is a durable seal-brown surface, while seat-back frames and pedestals are olive-green.

From the Transportation Department's viewpoint, the Metropolitan Coach has the most outstanding requisites for profitable mass transportation. Only A. C. C. universal experience and vision could produce it.

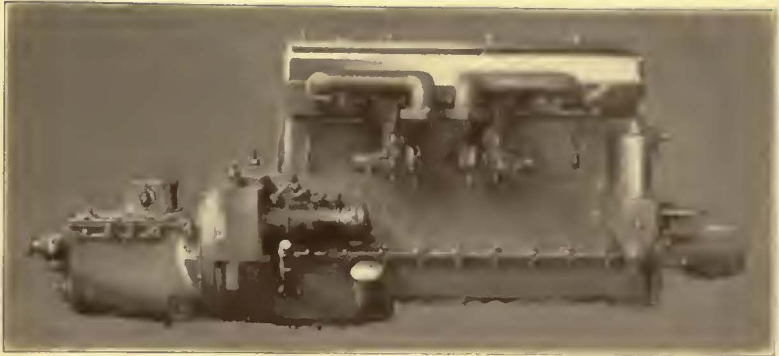


Over the engine a pair of two passenger seats, back to back, form a gas-tight housing. Practically every square foot within the coach is thus devoted to revenue-gaining space. Every detail reflects the broad experience of A. C. C. with most successful mass transportation equipment of all types.



300,000,000 Mile A.C.F. Power Plant

The A.C.F. Metropolitan Coach has a power plant relatively as advanced as the remarkable structural design and revenue possibilities. The power source is a 6-cylinder $4\frac{1}{4}'' \times 5\frac{1}{2}''$ Hall-Scott engine, of ability proven in every transportation field by more than 300,000,000 miles of conspicuous success—often under conditions thought to be "death to engines."



Twin carburetors wring full power from the fuel while a two-part exhaust manifold reduces back pressure. The manually actuated starter guarantees reliability. A large oil filter purifies continuously—only clean, fresh oil reaches working parts. A 600-watt generator is supplied. Air-compressor capacity of 6 cubic feet is ample to keep adequate pressure in the reserve tank.

Alignments of the wheelbase but offset in the floor framing, the engine is on steel channels which transmit weight and torque reaction to the truss-like structural framing. Smoothness is enhanced by the fact that the Hall-Scott engine is so nearly vibrationless inherently that dampers, buffers and shock absorbing contrivances have never been required. At only 1600 r. p. m. nearly 100 h. p. is delivered. Only three speed changes are necessary in the gear-set, unit-mounted

with the engine and single plate clutch. Eliminating the usual fourth speed permits provision for faster acceleration in first and second gears, and a radical decrease in total gear changes daily. Fast schedules can be comfortably maintained without top speed over 30 m. p. h.



The three-speed gearset, with its wide-face gears and heavy short shafts, permits more enduring construction and greater quiet. The short drive shaft transmitting power to a full-floating worm axle assures smooth, trouble-proof drive. Whipping tendencies are eliminated, and with concentration of stresses avoided by the novel coach structure, urban mass transportation becomes the smoothest ever known.

In the final analysis the Metropolitan design means a saving, at full passenger load, of more than 100 pounds per seat over any other type with the same overall dimensions. Total weight is only 1,000 pounds more than that of well built coaches of conventional capacity, yet fuel and tire costs may be figured at only 10% more!

aintenance and minor adjustment are very convenient, due to the engine position. The cylinder head may be easily removed and a spare used, which valves ground and adjusted, substituted in less than an hour. Timing may be adjusted through hand-ports in the crank case. For a complete overhaul, usually not needed under 150,000 miles, the entire power plant can be dropped in a pit and a spare plant can be speedily substituted. A single spare cylinder head and power plant virtually insures continuous operation of 10 to 20 Metropolitan Coaches. Similarly axles and wheels can be rolled from beneath the coach, as in street car practice.



Metropolitan All-Steel 40 Passenger Coach

A.C.F. Model 511-1H1

A careful study of the specifications reveals exactly how A.C.F. has conceived and built a spacious, attractive, single-deck coach with fully 25 per cent more seating capacity than previous urban types, offering every opportunity for more dollar income. But operating expense per seat mile obviously does not begin to increase in proportion to the revenue possibilities.

Capacity: 40 seated passengers.

Arrangement: For one-man operation with double right-front, air-operated doors for entrance and exit.

General Dimensions

Length: Over attached spring bumpers.....	31' 0"
Over integral bumper-bars.....	30' 0"
Width: Overall.....	96"
Over rear tires (38 x 9").....	95 3/4"
Over guard rails.....	95"
Inside at belt rails.....	88"
Aisle, between seat backs.....	21"
Aisle, between seat cushions.....	18"
Height: Ground to roof.....	112"
Ground to step.....	14"
Step to platform.....	12"
Ground to platform.....	26"
Ground to side sills.....	14"
Ground to window sills.....	56"
Headroom: Minimum under roof carlines.....	77"
Wheelbase.....	230"
Overhang ahead of front axle.....	38 1/2"
Overhang back of rear axle.....	95 1/2"
Tread: Front.....	78"
Rear.....	74"
Road Clearance, minimum.....	8"
Turning Radius, right or left.....	38' 0"

Structural Framing (all-steel)

Underframe

Center Sills: Three 5" steel channels extending the full length of the coach from front to rear bumper-bars and riveted securely to all cross floor-beams. Intermediate side channels riveted to steel wheel-housings.

Side Sills: 2 x 2 x 3/16 steel angles continuous around coach with curved sections welded in to form exterior face of wheel-housings.

Floor Beams: Zee-section structural steel, riveted to underframe members, pillars and paneling. Connection by large steel gusset plates. Both horizontal and vertical gussets employed to minimize body deformation in all planes.

Torsional Bracing: To prevent twist due to driving reaction from the springs or dynamic load from inequalities in the road, two tubular torsion members are placed at either end of the rear springs. Tubular members welded into square cast-steel braces which in turn are riveted to the side-sill angle and its mate 16" above.

Bumper Bar: Non-telescoping front-end as developed in railroad practice. Seven-inch structural steel channel curved to shape of front end of body with 1/8" steel plate, 8" wide, riveted to top flange as an integral part of the structural framing of the coach. Eliminates possibility of front end collapsing from collision-impact.

Engine Bed Framing: At right midway between axles. Power plant supported on 7" steel channels placed at floor level. Channels in turn supported by side sills and underframe center sills gusseted to vertical pillars and body paneling as well as floor beams. Entire structural framing of coach supports engine directly or indirectly.

Car Body Framing

Pillars: Tee-section in one continuous piece from the sill on one side up over the top and down to the sill on the opposite side. Pillars and carlines are one and the same.

Top Rail: 11" x 1/8" plate.

Side Panels: No. 16 gauge sheet-steel panels riveted to sills, floor support angles and vertical pillars to form, in effect, plate girders. All sheet steel of patent level grade or equal, smooth and free from surface defects.

Wheelhousings: Side sills curved up over wheels. Heavy steel plate shaped to form wheelhouse carries similarly curved steel angle along interior edge. Vertical plate riveted to this angle and to underframe channels make the wheel-house an integral part of the structural framing which stiffens the front end of the body rather than detracting strength.

Side Framing: Side-sill angle and a similar angle 16" above and parallel to it connected by the side-panel sheeting to form, in effect, a plate girder 16" deep as the main load-carrying structural members of the coach.

Spring Mounting, Rear: Cast-steel brackets clamped to tubular torsional members are prevented from turning by riveted connection to floor channels. Driving reaction from wheels transmitted directly to structural framing of the sides of coach and its underframe. Vertical load transmitted directly to 16" plate girders.

Spring Mounting, Front: Cast steel brackets riveted to front bumper channel and to first cross-channel of floor framing. Front spring load transmitted directly to underframe and side framing of coach.

Power Plant

Engine: Hall-Scott six-cylinder.....	4 1/4 x 5 1/2"
Carburetor—Plain tube, compensating.....	1 1/2"
Ignition—High-tension coil and distributor.....	
Radiator—Finned-tube, capacity gallons.....	12
Fans—Two four-blade, diameter.....	18"
Generator—12-volt, capacity in watts.....	600
Starting Motor—Gear drive to flywheel.....	

Clutch: Single-plate dry disc.

Transmission: Sliding gear, speeds forward..... 3

Propeller Shaft: One piece, tubular.

Universal Joints: Spicer, number..... 2

Front Axle: I-beam, drop-forged, beam size..... 3 1/2 x 2 3/8"

Rear Axle: Type, full floating, drive..... Worm
Housing diameter at spring seats..... 5"

Steering Gear: Screw and lever type.
Steering wheel, polished walnut, diameter..... 22"

Service Brakes: Internal expanding four-wheel.
Size, front..... 16 1/2 x 4" Rear..... 16 1/2 x 6"
Application—Westinghouse air-operated.
Materials—Metal-to-metal.

Emergency Brake: Disc type on drive shaft..... Dia. 16"

Tires: Front, single, high pressure..... 38 x 9"
Rear, dual, high pressure..... 38 x 9"

Wheels: Demountable steel disc.

Springs: Front, semi-elliptic single stage..... 49 x 4"
Rear, three-stage semi-elliptic..... 64 x 5"

Gasoline Tank: On right side, capacity gallons..... 80

Weight: Coach only (approximate) lbs.....	17,000
Per seated passenger (approx.) lbs.....	400
Per passenger, 80-passenger load, lbs.....	200
Tire load with 80-passengers, lbs.....	4,600
Rated load, 38 x 9" tire, lbs.....	5,000

101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may be ordered through any H-W sales office.



Interior of one of the Eastern Mass. Street Railway cars, showing the installation of our No. 327-M.



A MODERN CAR SEAT!

THE Eastern Massachusetts Street Railway was in the market for a modern car seat that would increase the attractiveness and comfort of its cars. It finally selected our 327-M—the new, fast-selling Heywood-Wakefield design shown above.

This seat has deep, double spring cushions. Mechanism rails are set in. The individual backs are properly pitched for comfort.

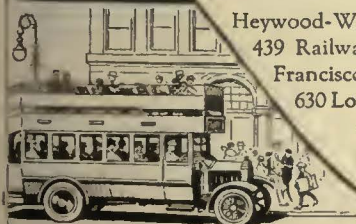
Our car seating experts will be glad to help you decide on the best seating equipment for your needs. This service is free through any H-W sales office.

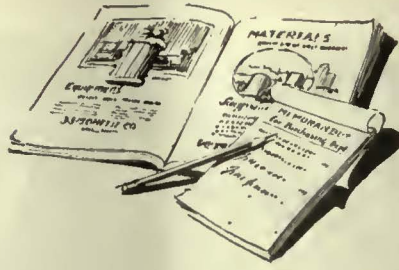
We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.



Heywood-Wakefield
REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.





This Growing Recognition of INDUSTRIAL ADVERTISING

Within one year McGraw-Hill Publications have gained 500 industrial advertisers and 3,000 industrial advertising pages. Now 3,500 advertisers are using 48,000 pages annually in McGraw-Hill Publications to help industry buy more intelligently.

* * * *

A study of this growth shows that old and new advertisers alike are recognizing more and more the business-building value of Industrial Advertising. It shows, too, that their advertising agents and bankers are recognizing its fundamental soundness—its minimum of waste.

* * * *

Among these 500 new McGraw-Hill advertisers are a number of good sized concerns, who, after searching investigations, have discovered the importance

of authoritative industrial publications to the men who buy or influence the buying of what they have to sell. These concerns are using specialized Industrial Advertising for the first time—with continuous schedules in McGraw-Hill Publications.

* * * *

Many of these 500 new McGraw-Hill advertisers, however, are newcomers to the industrial field. Their capital is limited. Their advertising schedules are consequently small. But—in their ranks are the industrial leaders of another generation. Tomorrow—bankers, lawyers and advertising agents will sense with pride their good fortune in serving them. For they are starting out no differently than today's leading industries who were little advertising fellows in McGraw-Hill Publications 10, 20 and 40 years ago.



McGraw-Hill Publishing Company, Inc., New York, Chicago, Philadelphia, Cleveland, St. Louis, San Francisco, London. Publishers of

McGraw-Hill

Publications

Electrical
 ELECTRICAL WEST
 ELECTRICAL WORLD
 ELECTRICAL MERCHANDISING

Construction & Civil Engineering
 ENGINEERING NEWS-RECORD
 CONSTRUCTION METHODS

Industrial
 POWER
 AMERICAN MACHINIST
 INDUSTRIAL ENGINEERING
 CHEMICAL & METALLURGICAL ENGINEERING

Catalogs and Directories
 McGraw-Hill Electrical Engineering Catalog
 McGraw-Hill Electrical Trade Catalog McGraw Central Station Directory
 Keystone Coal Mining Catalog McGraw Electric Railway Directory
 Keystone Metal Quarry Catalog Metal Quarry Directory
 Keystone Coal Buyers Catalog Coal Field Directory
 Bonbright Survey of Electric Power & Light Companies in the U. S.

Radio
 RADIO RETAILING

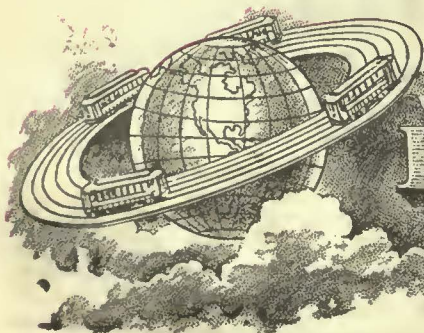
Transportation
 BUS TRANSPORTATION
 ELECTRIC RAILWAY JOURNAL

Mining
 COAL AGE
 COAL AGE NEWS
 ENGINEERING & MINING JOURNAL

Overseas
 INGENIERIA INTERNACIONAL
 AMERICAN MACHINIST
 (EUROPEAN EDITION)

800 PAGES USED ANNUALLY BY 3,500 INDUSTRIAL ADVERTISERS TO HELP INDUSTRY BUY MORE INTELLIGENTLY

JUST as the electric railway companies have to compile and be guided by exhaustive statistics as to peak loads, traffic densities, costs per mile, and so forth, we must constantly keep ourselves informed as to purchasing power, density of population and all vital market information in order to maintain our service as an active asset of your service.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

more miles—



Safely *with*

BETHLEHEM *Rolled Steel Wheels and Forged Steel Axles*

(Formerly known as CAMBRIA Wheels and Axles)

in

Electric Railway Service

*Other Bethlehem Products for
Electric Railways*

Axles, bolts, frogs, rails, armature shafts, pole line material, special layouts, switch stands, gear blanks, gage rods, splice bars, switches, crossings, guard rails, tie plates, tie rods, trackwork and spikes.



BETHLEHEM STEEL COMPANY

General Offices: BETHLEHEM, PA.

District Offices in New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Cincinnati, Chicago, Detroit, St. Louis, San Francisco, Los Angeles, Seattle, Portland.

Bethlehem Steel Export Corporation, 25 Broadway, New York City
Sole Exporter of our Commercial Products

BETHLEHEM

Everyone likes Oakite cleaning



GET in touch with any street railway company where Oakite cleaning materials are used, and you will find everyone in the organization who has anything to do with cleaning, prefers to clean the Oakite way.

The Superintendent—because Oakite cleaning costs less. The Head Foreman—because Oakite cleaning is fast, eliminating delays. The Workman who does the cleaning—because Oakite methods mean less hand scrubbing, and the Oakite solution does not irritate the skin, injure clothing, or give off disagreeable fumes.

Your shopmen, too, will like Oakite cleaning. Have one of our Service Men call and give your superintendent full information.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada

Oakite is manufactured only by
OAKITE PRODUCTS, INC. 28B Thames St., NEW YORK, N. Y.
(Formerly OAKLEY CHEMICAL CO.)

OAKITE

TRADE MARK REG. U. S. PAT. OFF.

Industrial Cleaning Materials and Methods

ELECTRICAL INSULATION

PERFECT
MICANITE and EMPIRE
INSULATOR

Micanite and Super-Micanite Sheets, Commutator Segments, and Commutator Rings.

Micanite Tubes and Washers

Linotape, Seamless or Sewn Bias
(Yellow or Black Varnished Tapes)

Empire Oiled Cloths and Papers
(Yellow or Black)

Compounds, Varnishes, Etc.

Send for catalog and helpful booklet on Commutator Insulation and Assembly

MICA INSULATOR COMPANY

Largest manufacturers in the world of mica insulation.
Established 1893.

New York: 68 Church St. Chicago: 542 So. Dearborn St.

Cleveland
San Francisco

Pittsburgh
Los Angeles

Cincinnati
Seattle

Works: Schenectady, New York. Victoriaville, Canada; London, England



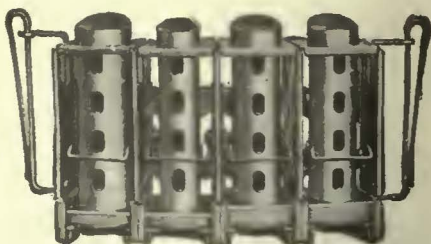
JOHNSON FARE COLLECTING SYSTEMS



Johnson Electric Fare Boxes and overhead registers make possible the instantaneous registering and counting of every fare. Revenues are increased 1½ to 5% and the efficiency of one-man operation is materially increased. Over 4000 already in use.

When more than two coins are used as fare, the Type D Johnson Fare Box is the best manually operated registration system. Over 50,000 in use.

Johnson Change-Makers are designed to function with odd fare and metal tickets selling at fractional rates. It is possible to use each barrel separately or in groups to meet local conditions. Each barrel can be adjusted to eject from one to five coins or one to six tickets.



Johnson Fare Box Co.

4619 Ravenswood Ave., Chicago, Ill.

Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

"SEARCHLIGHT"



COLUMBIA

Railway Supplies and Equipment

Machine and Sheet Metal Work

Forgings
Special Machinery and Patterns

Grey Iron and Brass Castings

Armature and Field Coils.

The Columbia Machine Works and M. I. Co.
265 Chestnut St., corner Atlantic Ave.,
Brooklyn, New York



AXLES

MORE than sixty years of experience in the manufacture of axles, coupled with every facility for correct heat treatment and accurate testing, insure the meeting of the specification in the finished product.

Prompt deliveries of Car and Tender Axles, Engine Truck and Driving Axles, Electric Motor and Street Car Axles, Miscellaneous Forgings.

CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue
PITTSBURGH PENNSYLVANIA



1835



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

Why



Le Carbone? Carbon Brushes?

Reason No. 11

If it were possible to estimate the number of the tow-ins and the tie-ups which have been avoided by "Le Carbone" Carbon Brushes, these figures easily would constitute the only reason needed for their use.

They talk for themselves

W. J. Jeandron

Factory Terminal Bldg.
Fifteenth Street, Hoboken, N. J.
Pittsburgh Office: 631 Wabash Bldg.
Chicago Office: 1657 Montnook Block
San Francisco Office: 525 Market Street
Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto

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

Design and Construction
Examinations Reports Appraisals
Industrial and Public Service Properties

NEW YORK BOSTON CHICAGO

THE BEELER ORGANIZATION

Transportation, Traffic, Operating Surveys
Better 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

ENGELHARDT W. HOLST

Consulting Engineers

Appraisals Reports Rates Service Investigation
Studies on Financial and Physical Rehabilitation
Reorganization Operation Management

683 Atlantic Ave., BOSTON, MASS.

ALBERT S. RICHEY

ELECTRIC RAILWAY ENGINEER

WORCESTER, MASSACHUSETTS

REPORTS - APPRAISALS - RATES - OPERATION - SERVICE

LINN & MARSHALL, Inc.

Financing — Engineering — Management

PUBLIC UTILITIES
ELECTRIC RAILWAYS — MOTOR BUSES —
GAS — ELECTRIC

25 Broadway, New York City

BUCHANAN & LAYNG CORPORATION

Engineering and Management, Construction
Financial Reports, Traffic Surveys
and Equipment Maintenance

C. B. BUCHANAN President W. H. PRICE, JR. Sec'y-Treas. JOHN F. LAYNG Vice-President
BALTIMORE 1004 Citizens National Bank Bldg. Phone: NEW YORK 49 Wall Street
Hanover: 2142

DAY & ZIMMERMANN, INC. ENGINEERS

DESIGN - CONSTRUCTION - REPORTS
VALUATIONS - MANAGEMENT

NEW YORK PHILADELPHIA CHICAGO

HEMPHILL & WELLS

CONSULTING ENGINEERS

Gardner F. Wells Albert W. Hemphill

APPRAISALS
INVESTIGATIONS COVERING

Reorganization Management Operation Construction
43 Cedar Street, New York City

STEVENS & WOOD

INCORPORATED

ENGINEERS AND CONSTRUCTORS

120 BROADWAY, NEW YORK

ENGINEERING CONSTRUCTION YOUNGSTOWN, O. FINANCING MANAGEMENT

KELKER, DELEUW & CO.

CONSULTING ENGINEERS

REPORTS ON

Operating Problems Valuations Traffic Surveys

111 W. Washington Street, Chicago, Ill.

McCLELLAN & JUNKERSFELD

Incorporated

ENGINEERING AND CONSTRUCTION

Examinations—Reports—Valuations
Transportation Problems—Power Developments
68 Trinity Place, New York

Chicago

St. Louis

E. H. FAILE & CO.

Designers of

Garages—Service Buildings—Terminals

441 LEXINGTON AVE. NEW YORK

WALTER JACKSON

Consultant on Fares and Motor Buses

The Weekly and Sunday Pass—Differential
Fares—Ride Selling

Holbrook Hall 5-W-3

160 Gramatan Ave., Mt. Vernon, N. Y.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

BRANCH OFFICES

BOSTON, 80 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., Gasco Building



WORKS
Bayonne, N. J.
Barberton, Ohio

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, Kearns Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Agular 104
SAN JUAN, Porto Rico, Royal Bank Building

THE P. EDWARD WISH SERVICE
50 Church St. NEW YORK
Street Railway Inspection
DETECTIVES
131 State St. BOSTON

**Byllesby
Engineering & Management
Corporation**
231 S. La Salle Street, Chicago
New York San Francisco

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

Hale and Kilburn SEATS
Better Quality Seats For Cars and Buses
Hale-Kilburn Co.
1800 Lehigh Ave., Philadelphia, Pa.

RAIL GRINDERS AND WELDERS
Railway Track-work Co., Philadelphia
652

Transmission Line and Special Crossing Structures, Catenary Bridges
WRITE FOR OUR NEW DESCRIPTIVE CATALOG
ARCHBOLD-BRADY CO.
Engineers and Contractors SYRACUSE, N. Y.

Hubbard and COMPANY
PITTSBURGH OAKLAND CHICAGO

UNA
RAIL JOINTS
DYNAMOTORS
WELDING ROD
UNA Welding & Bonding Co.
Cleveland, Ohio.

PS HEATERS
Car Heating and Ventilating
—are no longer operating problems. We can show you how to take cars of both with one equipment. The Peter Smith Forced Ventilation Hot Air Heater will save, in addition, 40% to 60% of the cost of any other car heating and ventilating system. Write for details.
The Peter Smith Heater Company
6209 Hamilton Ave., Detroit, Mich.

Boyerized Parts:

Brake Pins	Spring Post Bushings
Brake Hangers	Spring Posts
Brake Levers	Bolster and Transom
Pedestal Gibs	Chaffing Plates
Brake Pulcrums	Manganese Brake Heads
Turnbuckles	Manganese Truck Parts
Center Bearings	Bushings
Side Bearings	Bronze Bearings
	McArthur Turnbuckles

Can be purchased through the following representatives:

Economy Electric Devices Co.
72 W. Van Buren St., Chicago, Ill.
F. F. Bodier,
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,
519 Delta Bldg., Los Angeles, Cal.

Bemis Car Truck Company
Springfield, Mass.

TULC LUBRICANT

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.



AMERICAN BRIDGE COMPANY

EMPIRE BUILDING—71 BROADWAY NEW YORK, N. Y.

Manufacturers of Steel Structures of all classes particularly BRIDGES AND BUILDINGS

ALSO STEEL BARGES FOR HARBORS AND RIVERS, STEEL TOWERS FOR ELECTRIC TRANSMISSION, HEROULT ELECTRIC FURNACES, ETC.

SALES OFFICES:

NEW YORK, N. Y.
Philadelphia, Pa.
Boston, Mass.
Baltimore, Md.

PITTSBURGH, PA.
Cincinnati, Ohio
Cleveland, Ohio
Detroit, Mich.

CHICAGO, ILL.
St. Louis, Mo.
Denver, Colo.
Salt Lake City, Utah

Pacific Coast Representative:
U. S. Steel Products Co.,
Pacific Coast Dept.
San Francisco, Cal.
Los Angeles, Cal.
Portland, Ore.
Seattle, Wash.

Export Representative: United States Steel Products Co., 30 Church Street, New York.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Philadelphia Chicago Cleveland New York
Pittsburgh Dallas

Pacific Coast Representative:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.

TISCO MANGANESE STEEL SPECIAL TRACKWORK

Wharton Tisco Manganese Steel Trackwork will help you hold the up-keep down.

WM. WHARTON JR. & CO., INC.
Easton, Penna.

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.

B. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Graybar Building, 420 Lexington Ave., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

RAILWAY SUPPLIES

Tool Steel Gears and Pinions	Ft. Pitt Spring & Mfg. Co.
Anglo-American Varnish Co., Varnishes, Enamels, etc.	Springs
National Hand Holds	Flaxlinum Insulation
Genesco Paint Oils	Anderson Slack Adjusters
Dunham Hopper Door Device	Economy Electric Devices Co.
Garland Ventilators	Power Saving and Inspection Meters
Walter Tractor Snow Plows	"Topseald" Lamps
Feasible Drop Brake Staffs	Bus Lighting Equipment
	Cowdry Automotive Brake Testing Machine



Reg. U. S. Pat. Office

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.

Chicago, 20-32 West Randolph Street.
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

THE WORLD'S STANDARD

"IRVINGTON"

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., N. Y.	Prehler Brothers Inc., Chicago
E. M. Wolcott, Rochester	White Supply Co., St. Louis
I. W. Levine, Montreal	Clapp & LaMoree, Los Angeles
A. L. Gillies, Toronto	Martin Woodard, Seattle
	Consumers' Rubber Co., Cleveland

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 \$2.00.
 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.....\$1.50 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

A working barn foreman can wind and solder transformers do any kind of wiring and controller repairs. 12 years' experience both single and double truck. PW-54, Electric Railway Journal, 1600 Arch St., Philadelphia, Pa.

EXECUTIVE'S assistant—young electrical engineer with thorough practical and professional engineering experience, on electric railway equipment. Know how to manage labor. Believe in the future of the electric railway and have original ideas, some of which have been put into successful practice. Not afraid of work, can produce results as an executive's assistant or in similar capacity. PW-56, Electric Railway Journal, Tenth Ave. at 6th Street, New York.

SUPERINTENDENT bus operation. Experienced executive in charge of transportation and maintenance 50 motorbuses on large electric railway property. Previous experience assistant superintendent of transportation handling discipline, labor cases, etc. Excellent references. C. V. Wood, Jr., 145 State Street, Springfield, Mass.

POSITIONS WANTED

WOULD like to correspond with any company needing a high-grade official in any capacity, in city or interurban railways. Can manage any or all departments in the most efficient manner. PW-33, Electric Railway Journal, Guardian Bldg., Cleveland, O.

Keep your Eye
 on the
Searchlight
 Section
 and your
 Advertisements in it

0197

POSITIONS WANTED

SUPERINTENDENT transportation, qualified by wide experience, fine record in city and interurban operation and coordination rail and bus service. Exceptional ability in dealing successfully with labor, public, public officials, resulting in increased revenue, reduced operating costs. A progressive efficient operating official with high grade references. Correspondence invited. PW-53, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

GENERAL superintendent or manager; fifteen years' successful experience. PW-55, Electric Railway Journal, Tenth Ave. at 36th St., New York.

FOR SALE

15 BIRNEY SAFETY CARS
 Brill Built
 West, 508 or G. E. 204 Motors
 Cars Complete—Low Price—Fine Condition
ELECTRIC EQUIPMENT CO.
 Commonwealth Bldg., Philadelphia, Pa.

Searchlight Results:

Positions Vacant:

"The strongest proof that your Searchlight Department finds its way to many readers is shown by the numerous letters we have received in answer to our recent advertisement."

Secretary—A Connecticut Railway Co.

"You gave us one good man as a result of a similar advertisement in the Electrical Railway Journal some time ago. Please give us another."

Proprietor of Steel Sales Agency.

Positions Wanted:

"The result of advertising in the Searchlight Section of your Electric Railway Journal I have secured a position with The _____ Traction Co. of W. Va."

"I received 8 replies and accepted a position with the _____ Railway Co. with over 30% increase in salary."

Business Opportunity:

Advertisement for investment to develop or acquire Traction Light & Pr. "The results from the advertisement in Electric Railway Journal have been satisfactory."

New York City Attorney.

Equipment For Sale:

"Our advertisement in the Electric Railway Journal located a buyer, and I have disposed of the car in question."

President—Buffalo Industrial Plant.

"We have disposed of all of our Girder Rails advertised in your paper. We are frank to tell you that the material went to three different traction lines and represents three separate and distinct new accounts. Our idea is that when it comes to bringing something to buyers in the traction field, there is but one sheet, and that is yours."

Desler—New York City.

"There is no necessity for the continuation of this advertising, for the reason that we could have sold this equipment five times over from the advertisement that was run one time."

Superintendent—A Pennsylvania Railway Co.

Equipment Wanted:

"The two insertions of this advertisement which you displayed in admirable manner were sufficient to obtain for us the exact equipment that we desired."

Superintendent—A New England Railway Co.

For Every Business Want: "Think Searchlight First"

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

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
General Electric Co.
Westinghouse Air Brake Co.

Anchor, Guy
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Automatic Return Switch
Stands
Ramapo Ajax Corp.

Automatic Safety Switch
Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Cincinnati Car Co.
Illinois Steel Co.
St. Louis Car Co.
Standard Steel Works
Taylor Electric Truck Co.
Westinghouse E. & M. Co.

Babbitting Devices
Columbia Machine Works & M. I. Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.
American Bridge Co.

Batteries, Dry
Nichols-Lintern Co.

Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Taylor Electric Truck Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller
Side
Cincinnati Car Co.
Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells and Boppers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Brill Co., The J. G.
Cummings Car & Coach Co.
St. Louis Car Co.

Body Material, Haskelite & Plymetal
Haskelite Mfg. Corp.

Bollers
Babcock & Wilcox Co.

Bolts & Nuts, Trank
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
American Steel & Wire Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, etc.)
American Bridge Co.
Bates Expanded Steel
Truss Co.
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Cincinnati Car Co.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoes & Foundry Co.
Bemis Car Truck Co.

Brill Co., The J. G.
St. Louis Car Co.
Taylor Electric Truck Co.

Brake Testers
National Ry. Appliance Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.
General Electric Co.
National Brake Co.
St. Louis Car Co.
Taylor Electric Truck Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Ball
Cincinnati Car Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
LeCarbone Co.
Westinghouse E. & M. Co.

Brushholders
Columbia Machine Works
General Electric Co.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Buses
Cummings Car & Coach Co.
General Electric Co.
Studebaker Corp. of America
Yellow Truck & Coach Co.

Bus Lighting
National Ry. Appliance Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
St. Louis Car Co.

Cables (See Wires and Cables)

Cambrie Tapes, Yellow and Black Varnish
General Electric Co.
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

Cars, Passenger, Freight, Express, etc.
American Car Co.
Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
St. Louis Car Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works & M. I. Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works & M. I. Co.
St. Louis Car Co.
Standard Steel Works

Castings, Malleable & Brass
Bemis Car Truck Co.

Columbia Machine Works & M. I. Co.
St. Louis Car Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceilings, Car
Haskelite Mfg. Corp.

Ceilings, Plywood Panels
Haskelite Mfg. Corp.

Chairs, Parlor Car
Heywood Wakefield Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Change Trays
Cincinnati Car Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

Clamps and Connectors for Wires and Cables
Columbia Machine Works
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Westinghouse E. & M. Co.

Cleaners
Oakite Products Co.

Cleaners and Scrapers Track (See also Snow-Flows, Sweepers and Brooms)
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
St. Louis Car Co.

Coil Banding and Winding Machines
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Colls, Armature and Field
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Colls, Choke and Kieking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Changers
Illinois Motive Equipment Co.
Johnson Fare Box Co.

Coin Counting Machines
Cleveland Fare Box Co.
International Register Co.
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.
Johnson Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Columbia Machine Works
Elec. Service Supplies Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutators or Parts
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condenser Papers
Irvington Varnish & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Traller Car
Columbia Machine Works
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
Columbia Machine Works & M. I. Co.
General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse E. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse E. & M. Co.

Conveying & Hoisting Machinery
American Bridge Co.

Copper Wire
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
American Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbing's Sons Co., John A.
St. Louis Car Co.
Samson Cordage Works

Cord Connectors and Couplers
Elec. Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.
Ohio Brass Co.
Westinghouse Traction
Brake Co.

Cowl Ventilators
Nichols-Lintern Co.

Cranes, Hoists & Lifts
Electric Service Supplies Co.

Cross Arms (See Brackets)

Crossing Foundations
International Steel Tie Co.

Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Frogs & Switches
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Track (See Track Special Work)

Crossings, Trolley
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains & Curtain Fixtures
Brill Co., The J. G.
St. Louis Car Co.

Cutting Apparatus
Electric Railway Improvement
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse Electrical & Mfg. Co.

Dealer's Machinery & Second Hand Equipment
Electric Equipment Co.

Derailing Devices (See also Track Work)

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Columbia Machine Works & M. I. Co.
Elec. Service Supplies Co.

Detective Service
Wish-Servic, P. Edward

Door Operating Devices
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Heating Co.
National Pneumatic Co.

Doors & Door Fixtures
Brill Co., The J. G.
Cincinnati Car Co.
Hale-Kilburn Co.
St. Louis Car Co.

Doors, Folding Vestibule
National Pneumatic Co.

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Ears
Columbia Machine Works & M. I. Co.
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Trackwork Co.

Electric Rivet Heaters
American Car & Fdry. Co.

Electric Transmission Towers
American Bridge Co.

Electrical Wires and Cables
Amer. Electrical Works
American Steel & Wire Co.
John A. Roebbing's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Trackwork Co.
Una Welding & Bonding Co.

Engineers, Consulting, Contracting and Operating
Archbold-Brady Co.
Beeler, John A.
Bylesby Co., H. M.
Day & Zimmermann, Inc.
Falls & Co., E. H.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLuw
Linn & Marshall Co.
McClellan & Junkerfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster Co.
White Eng. Corp., The J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Engines, Gasoline
Waukesha Motor Co.

Exterior Side Panels
Haskelite Mfg. Corp.

Fare Boxes
Cleveland Fare Box Co.
Johnson Fare Box Co.
Illinois Steel Co.
Perey Mfg. Co.

Fare Registers
Electric Service Supplies Co.
Johnson Fare Box Co.

Fences, Woven Wire & Fence Posts
American Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Cincinnati Car Co.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tubing
Westinghouse E. & M. Co.

Field Colls (See Colls)

Floodlights
Electric Service Supplies Co.
General Electric Co.

Floors
Haskelite Mfg. Corp.

Floors, Sub
Haskelite Mfg. Corp.

Forgings
Brill Co., The J. G.
Cincinnati Car Co.
Standard Steel Works

Frogs & Crossings, Tee Ball
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
Electric Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Furnaces, Electric Steel Melting
American Bridge Co.

Fuses and Fuse Boxes
Columbia Machine Works & M. I. Co.
Consolidated Car Heating Co.
General Electric Co.
Westinghouse E. & M. Co.

Gas Electric Drive for Buses
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.
Cincinnati Car Co.
St. Louis Car Co.

Gear Blanks
Brill Co., The J. G.
Standard Steel Works

Gear Cases
Chillingworth Mfg. Co.
Columbia Machine Works & M. I. Co.
Electric Service Supplies Co.
Westinghouse E. & M. Co.

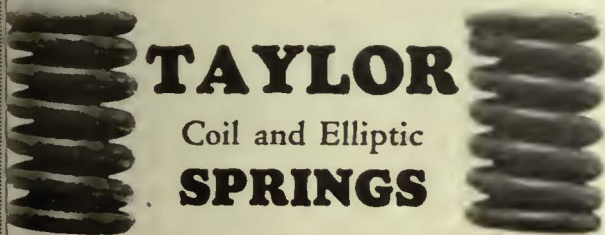
Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

New York Chicago Boston Cleveland Pittsburg Denver
 San Francisco U. S. Steel Products Co. Los Angeles Portland Seattle



TAYLOR Coil and Elliptic SPRINGS

insure easy riding cars and reduce maintenance

TAYLOR ELECTRIC TRUCK CO.
 TROY, N. Y., U. S. A.

"The Standard for Rubber Insulation"

INSULATED WIRES and CABLES

"Okonite," "Manson," and Dundee "A" "B" Tapes

Send for Handbook

The Okonite Company

The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J. PATERSON, N. J.
 Sales Offices: New York Chicago Pittsburgh St. Louis Atlanta
 Birmingham San Francisco Los Angeles Seattle

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



ELRECO TUBULAR POLES



THE "WIRE LOCK" / / THE CHAMFERED JOINT

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

Efficient Bus Heating
 with

The N-L Venti-Duct Heater

THE NICHOLS-LINTERN CO.
 7960 Lorain Ave. Cleveland, Ohio

Rod, Wire and Cable Products

ANACONDA
 from mine to consumer

ANACONDA COPPER MINING COMPANY
 THE AMERICAN BRASS COMPANY
 General Offices - 25 Broadway, New York

ANACONDA TROLLEY WIRE

NAUGLE POLES

WESTERN & NORTHERN CEDAR
NAUGLE POLE & TIE CO.
 59 E. MADISON ST. CHICAGO ILL.
 New York - Columbus - Kansas City - Spokane - Vancouver - Boston

ILLINOIS MOTIVE EQUIPMENT COMPANY

J. D. Elsom, President
 RAILWAY AND AUTOMOTIVE SUPPLIES
 35 EAST WACKER DRIVE, CHICAGO
 WESTERN REPRESENTATIVES:
 JOHNSON FARE BOXES
 METAL TICKETS COIN CHANGERS

WHAT HAVE YOU

FOR SALE ?
 FOR RENT ?
 FOR EXCHANGE ?

Up-to-date buyers in this industry watch the Second-Hand Equipment pages of this paper.

ELECTRICAL WIRES and CABLES

ROEBLING

John A. Roebling's Sons Co., Trenton, N.J.

SAMSON SPOT WATERPROOFED TROLLEY CORD



Trade Mark Reg. U. S. Pat. Off.
 Made of extra quality stock firmly braided and smoothly finished
 Carefully inspected and guaranteed free from flaws.
 Samples and information gladly sent.

SAMSON CORDAGE WORKS, BOSTON, MASS.



Gets Every Fare PEREY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

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

Gears and Pinions
 Bemis Car Truck Co.
 Columbia Machine Works & M. I. Co.
 Electric Service Supplies Co.
 General Electric Co.
 Nat'l Ry. Appliances Co.
 Tool Steel Gear & Pinion Co.

Generators
 General Electric Co.
 Westinghouse E. & M. Co.

Older Ralls
 Bethlehem Steel Co.
 Lorain Steel Co.

Gongs (See Bells and Gongs)

Greases (See Lubricants)

Grinders, Portable
 Railway Trackwork Co.

Grinders, Portable Electric
 Railway Trackwork Co.

Grinding Bricks and Wheels
 Railway Trackwork Co.

Guard Rail Clamps
 Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
 Ramapo Ajax Corp.
 Wm. Wharton, Jr. & Co.

Guards, Trolley
 Elec. Service Supplies Co.
 Ohio Brass Co.

Harps, Trolley
 Columbia Machine Works
 Elec. Service Supplies Co.
 Star Brass Works

Headlights
 Elec. Service Supplies Co.
 General Electric Co.
 Ohio Brass Co.
 St. Louis Car Co.

Headlining
 Columbia Machine Works & M. I. Co.
 Haskelite Mfg. Corp.

Heaters, Bus
 Nichols-Lintern Co.

Heaters, Car (Electric)
 Consolidated Car Heating Co.
 Gold Car Heat. & Lig. Co.
 Railway Utility Co.
 Smith Heater Co., Peter

Heaters, Car, Hot Air and Water
 Smith Heater Co., Peter

Heaters, Car Stove
 Smith Heater Co., Peter

Heaters, Electric Rivet
 American Car & Fdry. Co.

Helmets, Welding
 Railway Trackwork Co.
 Una Welding & Bonding Co.

Holts & Lifts
 Columbia Machine Works & M. I. Co.

Hose, Bridges
 Ohio Brass Co.

Hose, Pneumatic
 Westinghouse Traction Braks Co.

Instruments, Measuring, Testing and Recording
 American Steel & Wire Co.
 General Electric Co.
 National Ry. Appliances Co.
 Westinghouse E. & M. Co.

Insulating Cloth, Paper and Tape
 General Electric Co.
 Irvington Varnish & Ins. Co.
 Okonite Co.
 Okonite-Callender Cable Co.
 Westinghouse E. & M. Co.

Insulating Silk
 Irvington Varnish & Ins. Co.

Insulating Varnishes
 Irvington Varnish & Ins. Co.

Hose, Pneumatic
 Westinghouse Traction Braks Co.

Insulation (See also Paints)
 Electric Ry. Equipment Co.
 Elec. Service Supplies Co.
 Irvington Varnish & Ins. Co.

Okonite Co.
 Okonite-Callender Cable Co.
 Westinghouse E. & M. Co.

Insulation Slats
 Irvington Varnish & Ins. Co.

Insulator Pins
 Elec. Service Supplies Co.
 Hubbard & Co.
 Ohio Brass Co.

Insulators (See also Line Materials)
 Elec. Ry. Equipment Co.
 Elec. Service Supplies Co.
 General Electric Co.
 Irvington Varnish & Ins. Co.
 Ohio Brass Co.
 Westinghouse E. & M. Co.

Interior Side Linings
 Haskelite Mfg. Corp.

Jacks (See also Cranes, Helms and Lifts)
 Columbia Machine Works & M. I. Co.
 Elec. Service Supplies Co.
 Joints, Ball (See Rail Joints)

Journal Boxes
 Bemis Car Truck Co.
 Brill Co., The J. G.
 Cincinnati Car Co.
 St. Louis Car Co.

Lamp Guards and Fixtures
 Elec. Service Supplies Co.
 Westinghouse E. & M. Co.

Lamps, Arc & Incandescent (See also Headlights)
 General Electric Co.
 Westinghouse E. & M. Co.

Lamps, Signal and Marker
 Elec. Service Supplies Co.
 Nichols-Lintern Co.
 Lanterns, Classification
 Nichols-Lintern Co.

Letter Boards
 Cincinnati Car Co.
 Haskelite Mfg. Corp.

Lighting Fixtures, Interior
 Electric Service Supplies Co.

Lightning Protection
 Elec. Service Supplies Co.
 General Electric Co.
 Westinghouse E. & M. Co.

Line Material (See also Brackets, Insulators, Wires, etc.)
 Archbold-Brady Co.
 Electric Ry. Equipment Co.
 Elec. Service Supplies Co.
 General Electric Co.
 Hubbard & Co.
 Ohio Brass Co.
 Westinghouse E. & M. Co.

Locking Spring Boxes
 Wm. Wharton, Jr. & Co.

Locomotives, Electric
 Cincinnati Car Co.
 Cummings Car & Coach Co.
 General Electric Co.
 St. Louis Car Co.
 Westinghouse E. & M. Co.

Lubricating Engineers
 Universal Lubricating Co.

Lubricants, Oil and Grease
 Universal Lubricating Co.

Manganese Parts
 Bemis Car Truck Co.

Manganese Steel Guard Rails
 Ramapo Ajax Corp.
 Wm. Wharton Jr. & Co.

Manganese Steel, Special
 Tack 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)

Mirrors, Inside & Outside
 Cincinnati Car Co.

Motor Buses (See Buses)

Motors, Electric
 General Electric Co.
 Westinghouse E. & M. Co.

Motor, Generators & Controls for Electric Buses
 General Electric Co.

Motorman's Seats
 Brill Co., The J. G.
 Cincinnati Car Co.
 Elec. Service Supplies Co.
 Heywood Wakefield Co.
 St. Louis Car Co.
 Wood Co., Chas. N.

Nuts and Bolts
 Bemis Car Truck Co.
 Cincinnati Car Co.
 Hubbard & Co.
 Oils (See Lubricants)

Omnibuses (See Buses)
 Oxy-Acetylene (See Cutting Apparatus)

Packing
 Westinghouse Traction Brake Co.

Paints and Varnishes (Insulating)
 Elec. Service Supplies Co.
 Irvington Varnish & Ins. Co.

Paints & Varnishes, Railway
 National Ry. Appliances Co.

Pickup, Trolley Wire
 Elec. Service Supplies Co.
 Ohio Brass Co.

Pinion Fullers
 Elec. Service Supplies Co.
 Wood Co., Chas. N.

Pinions (See Gears)

Pins, Case Hardened, Wood and Iron
 Ohio Brass Co.
 Westinghouse Traction Brake Co.

Pipe Fittings
 Standard Steel Works
 Westinghouse Tr. Braks Co.

Placers (See Machine Tools)

Plates for Tee Rail Switches
 Ramapo Ajax Corp.

Pilers, Rubber Insulated
 Elec. Service Supplies Co.

Plywood Roofs, Headlinings, Floors, Interior Panels, Bulkheads, Truss Planks
 Haskelite Mfg. Corp.

Pole Line Hardware
 Bethlehem Steel Co.
 Elec. Service Supplies Co.
 General Electric Co.
 Ohio Brass Co.

Pole Reinforcing
 Hubbard & Co.

Poles, Metal Street
 Bates Expanded Steel Truss Co.

Elec. Ry. Equipment Co.
 Hubbard & Co.

Poles, Ties, Posts, Piling & Lumber
 Naule Pole & Tie Co.

Poles, Trolley
 Elec. Service Supplies Co.

Poles, Tubular Steel
 Elec. Ry. Equipment Co.
 Elec. Service Supplies Co.

Portable Grinders
 Railway Trackwork Co.

Pothead
 Okonite Co.
 Okonite-Callender Cable Co., Inc.

Power Houses
 American Bridge Co.

Power Saving Devices
 National Ry. Appliances Co.

Pressings, Special Steel
 Cincinnati Car Co.

Pressure Regulators
 General Electric Co.
 Westinghouse E. & M. Co.
 Westinghouse Traction Braks Co.

Punches, Ticket
 International Register Co.
 Wood Co., Chas. N.

Rail Braces and Fastenings
 Ramapo Ajax Corp.

Rail Grinders (See Grinders)

Rail Joints
 Carnegie Steel Co.
 Illinois Steel Co.
 Rail Joint Co.

Rail Joints, Welded
 Lorain Steel Co.

Rail Welding
 Railway Trackwork Co.
 Una Welding & Bonding Co.

Rails, Steel
 Carnegie Steel Co.
 Illinois Steel Co.

Railway Safety Switches
 Consolidated Car Heating Co.
 Westinghouse E. & M. Co.

Rattan
 Brill Co., The J. G.
 Cummings Car & Coach Co.
 Elec. Service Supplies Co.
 Hale-Kilburn Co.
 Heywood Wakefield Co.
 St. Louis Car Co.

Registers and Fittings
 Brill Co., The J. G.
 Cincinnati Car Co.
 Elec. Service Supplies Co.
 International Register Co.
 St. Louis Car Co.

Reinforcement, Concrete
 American Steel & Wire Co.
 Bethlehem Steel Co.
 Carnegie Steel Co.

Repair Shop Appliances (See also Coll Banding and Winding Machines)
 Elec. Service Supplies Co.

Repair Work (See also Colls)
 Westinghouse E. & M. Co.

Replacers, Car
 Cincinnati Car Co.
 Elec. Service Supplies Co.

Resistance
 Consolidated Car Heating Co.
 General Electric Co.

Resistance, Wire and Tube
 Westinghouse E. & M. Co.

Retrievers, Trolley (See Catchers and Retrievers Trolley)

Rhostrats
 General Electric Co.
 Westinghouse E. & M. Co.

Rivet Heaters, Electric
 American Car & Fdry. Co.

Roofing, Car
 Haskelite Mfg. Corp.

Roofs, Car & Bus
 Haskelite Mfg. Corp.

Sanders, Track
 Brill Co., The J. G.
 Elec. Service Supplies Co.
 Nichols-Lintern Co.
 Ohio Brass Co.
 St. Louis Car Co.

Sash Fixtures, Car
 Brill Co., The J. G.
 Cincinnati Car Co.
 St. Louis Car Co.

Sash, Metal Car Window
 Hale-Kilburn Co.

Seating Materials
 Haskelite Mfg. Corp.

Scrapers, Track (See Cleaners and Scrapers, Track)

Screw Drivers, Rubber Insulated
 Elec. Service Supplies Co.

Seating Materials
 Brill Co., The J. G.
 Heywood Wakefield Co.
 St. Louis Car Co.

Seats, Bus
 Brill Co., The J. G.
 Hale-Kilburn Co.
 Heywood Wakefield Co.
 St. Louis Car Co.

Seats, Car (See also Rattan)
 Brill Co., The J. G.
 Cincinnati Car Co.
 Hale-Kilburn Co.
 Heywood Wakefield Co.
 St. Louis Car Co.

Second Hand Equipment
 Electric Equipment Co.

Shades, Vestibule
 Brill Co., The J. G.
 Cincinnati Car Co.

Shovels
 Brill Co., The J. G.
 Hubbard & Co.

Shovels, Power
 Brill Co., The J. G.

Side Bearings (See Bearings Center and Side)

Signals, Car Starting
 Consolidated Car Heating Co.
 Elec. Service Supplies Co.
 National Pneumatic Co.

Signals, Indicating
 Nichols-Lintern Co.

Signal Systems, Block
 Elec. Service Supplies Co.
 Nachod and United States Electric Signal Co.
 Wood Co., Chas. N.

Signal Systems, Highway Crossing
 Nachod and United States Electric Signal Co.
 Wood Co., Chas. N.

Slack Adjusters (See Brake Adjusters)

Sleet Wheels and Cutters
 Cincinnati Car Co.
 Columbia Machine Works & M. I. Co.
 Elec. Ry. Equipment Co.
 Elec. Service Supplies Co.

Smokestacks, Car
 Nichols-Lintern Co.

Snow Plows
 National Ry. Appliances Co.

Snow-Plows, Sweepers and Brooms
 Brill Co., The J. G.
 Columbia Machine Works & M. I. Co.
 Consolidated Car Fender Co.
 Cummings Car & Coach Co.
 St. Louis Car Co.

Snow Sweeper, Rattan
 J. G. Brill Co.
 Heywood Wakefield Co.

Soldering and Brazing
 Apparatus (See Welding Processes and Apparatus)

Special Adhesive Papers
 Irvington Varnish & Ins. Co.

Special Trackwork
 Bethlehem Steel Co.
 Lorain Steel Co.
 Wm. Wharton, Jr. & Co.

Spikes
 American Steel & Wire Co.
 Illinois Steel Co.

Splicing Compounds
 Westinghouse E. & M. Co.

Splicing Sleeves (See Clamps and Connectors)

Springs
 National Ry. Appliances Co.

Springs, Car and Truck
 American Spiral Spring Co.
 American Steel Foundries
 American Steel & Wire Co.
 Bemis Car Truck Co.
 Brill Co., The J. G.
 Cincinnati Car Co.
 St. Louis Car 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.

Steel and Steel Products
 American Steel & Wire Co.
 Carnegie Steel Co.
 Illinois Steel Co.

Steps, Car
 Brill Co., The J. G.
 Cincinnati Car Co.

Stokers, Mechanical
 Babcock & Wilcox Co.
 Westinghouse E. & M. Co.

Stop Signals
 Nichols-Lintern Co.

Storage Batteries (See Batteries, Storage)

Strain Insulators
 Elec. Service Supplies Co.
 General Electric Co.
 Ohio Brass Co.
 Westinghouse E. & M. Co.

Strand
 American Steel & Wire Co.
 Roehling's Sons Co., J. A.

Street Cars (See Cars, Passenger, Freight, Express)
 Cummings Car & Coach Co.

Superheaters
 Babcock & Wilcox Co.

Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switches
 General Electric Co.

Switch Stands and Fixtures
 Ramapo-Ajax Corp.

Switches, Selector
 Nichols-Lintern Co.

Switches and Switchboards
 Consolidated Car Heating Co.
 Elec. Service Supplies Co.
 Westinghouse E. & M. Co.

Switches, Tee Rail
 Ramapo-Ajax Corp.

Switches, Track (See Track Special Work)

Tampers, Tie
 Railway Trackwork Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Tee Rail Special Track Work
 Ramapo-Ajax Corp.

Telephones and Parts
 Elec. Service Supplies Co.

Telephone & Telegraph Wire
 American Steel & Wire Co.
 John A. Roehlings Sons Co.

Testing Instruments (See Instruments, Measuring, Testing, etc.)

Thermostats
 Consolidated Car Heating Co.

Gold Car Heating & Lighting Co.
 Railway Utility Co.
 Smith Heater Co., Peter

Ticket Choppers and Destroyers
 Elec. Service Supplies Co.

Tie Plates
 Illinois Steel Co.

Ties and Tie Rods, Steel
 American Bridge Co.
 Carnegie Steel Co.
 International Steel Tie Co.

Ties, Wood Cross (See Poles, Ties, Posts, etc.)

Tires
 Goodyear Tire Co.

Tokens
 Johnson Fare Box Co.

Tongue Switches
 Wm. Wharton, Jr. & Co.

Tools, Track & Miscellaneous
 American Steel & Wire Co.
 Columbia Machine Works & M. I. Co.
 Elec. Service Supplies Co.
 Hubbard & Co.
 Railway Trackwork Co.
 Ramapo-Ajax Corp.

Towers and Transmitters
 American Bridge Co.
 Archbold-Brady Co.
 Bates Expanded Steel Truss Co.
 Westinghouse E. & M. Co.

Track Grinder
 Railway Trackwork Co.
 Ramapo-Ajax Corp.

Track, Special Work
 Columbia Machine Works & M. I. Co.
 Ramapo Ajax Corp.

Trackless Trolley Cars
 Brill Co., The J. G.
 St. Louis Car Co.

Transfer Tables
 American Bridge Co.

The DIFFERENTIAL CAR



Standard on
60 Railways for

- Track Maintenance
- Track Construction
- Ash Disposal
- Coal Hauling
- Concrete Materials
- Waste Handling
- Excavated Materials
- Hauling Cross Ties
- Snow Disposal

Use These Labor Savers

- Differential Crane Car
- Clark Concrete Breaker
- Differential 3-way Auto Truck Body
- Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.



International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

Type R-11
Double Register

The International Register Co.

15 South Throop Street, Chicago, Illinois



"Bates Poles Outlive the Bond Issues that Buy Them"

BATES POLES AND STRUCTURES

Bates **E**xpanded **S**teel **T**russ **C**o.

General Offices and Plants
EAST CHICAGO, INDIANA, U. S. A.

NACHOD & UNITED STATES SIGNAL CO., INC.

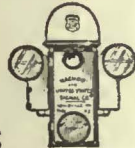
LOUISVILLE, KY.

BLOCK SIGNALS

FOR

ELECTRIC RAILWAYS

HIGHWAY CROSSING SIGNALS



RAILWAY UTILITY COMPANY

CAR COMFORT WITH HEATERS

UTILITY REGULATORS

VENTILATORS

2211-2217 Indiana St.
Chicago, Ill.

Write for
Catalogue

1528 Broadway
New York, N. Y.

GOLD CAR HEATING & LIGHTING CO.

220 36th St., Brooklyn, N. Y.

ELECTRIC HEATERS WITH OPEN COIL OR ENCLOSED ELEMENTS
THERMOSTAT CONTROL—VENTILATORS

WRITE FOR NEW CATALOGUE

EIGHT WORKS
RAMAPO, N. J. — ALBANY, N. Y. — HILLBURN, N. Y. — NIAGARA FALLS, N. Y. — CHICAGO, ILL. — EAST ST. LOUIS, ILL. — PUEBLO, COLORADO — SPOKANE, WISCONSIN — LOS ANGELES, CAL. — NIAGARA FALLS, ONT.

Ramapo Ajax Corporation

RAMAPO AUTOMATIC RETURN SWITCH STANDS FOR PASSING SIDINGS

TEE RAIL SPECIAL WORK

MANGANESE WORK A SPECIALTY

SALES OFFICES AT ALL WORKS
Main Office, HILLBURN, N. Y.



STUCKI SIDE BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.

H B LIFE GUARDS

PROVIDENCE FENDERS

Manufactured by

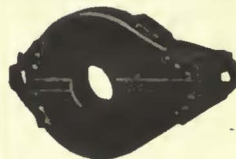
CONSOLIDATED CAR FENDER Co., PROVIDENCE, R. I.

General Sales Agents

WENDELL & MacDUFFIE CO., 110 E. 42nd St., N. Y. C.

Your Name

in this space in all issues where larger display space is not used backs up your advertising campaign and keeps your name in the classified section.



CHILLINGWORTH

One-Piece Gear Cases

Seamless—Rivetless—Light Weight
Best for Service—Durability and Economy. Write Us.

Chillingworth Mfg. Co.
Jersey City, N. J.

Chapman Automatic Signals

Charles N. Wood Co., Boston



Coin Counting and Sorting Machines

FARE BOXES

Lever-Operated and Slip Change Carriers

The Cleveland Fare Box Co.

Cleveland, Ohio

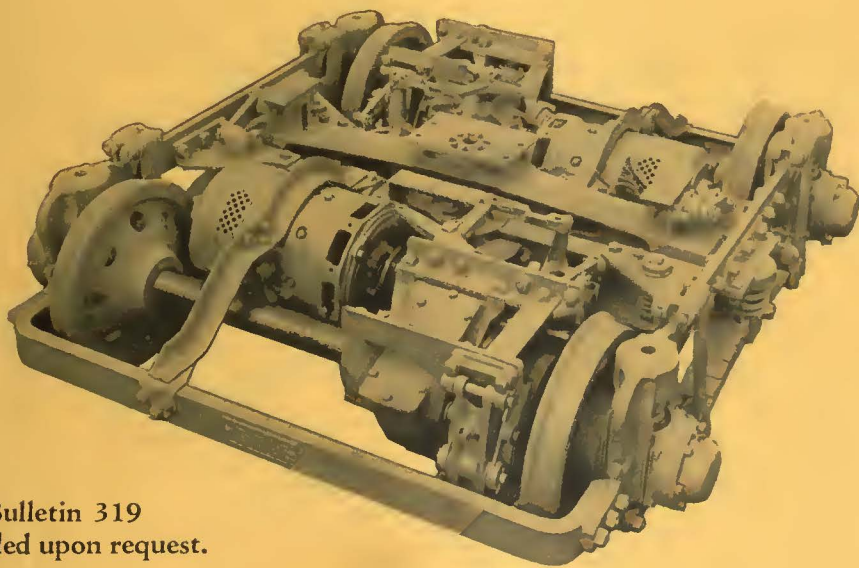
Canadian Cleveland Fare Box Co., Ltd., Preston, Ont.

Getting desired results without sacrifice—

Brill 277-EX Trucks under 1928 Model
Electric Car include many important features
of proven merit in actual service.

Noise reduction—the goal of recent developments in truck design—is accomplished in the new Brill 277-EX truck without sacrificing the squareness and strength assured by solid-forged sideframes, or the smooth and comfortable riding demonstrated by trucks equipped with the Brill Graduated Spring System, Half-Ball Bolster Guide and Twin Links.

With the motors entirely spring supported on the truck frame and driving the axles through double reduction gear units operating in oil and equipped with air actuated clasp type brakes with a drum on each axle at diagonal corners, objectionable noises are reduced to a minimum.



Copy of Bulletin 319
mailed upon request.

 **THE J. G. BRILL COMPANY** 
PHILADELPHIA, PA.
AMERICAN CAR CO. — G.C. KUHLMAN CAR CO. — WASON MANFC CO.
ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.

HASKELITE ROOF

HASKELITE Products

are used by every winner of the

COFFIN AWARD

1927—The Grand Rapids Railway Co.



One of 27 cars built by the St. Louis Car Co.

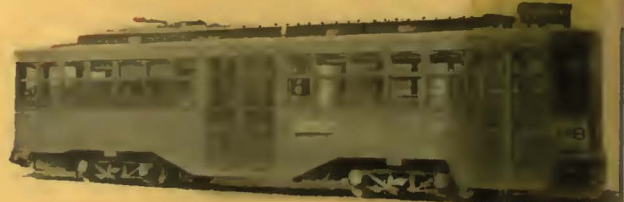


1926—The Pennsylvania-Ohio Electric Co.



Car built by the G. C. Kuhlman Car Company

1925—The Pittsburgh Railways



One of over 500 cars built by the Pressed Steel Car Co.

1924—The Northern Texas Traction Co.



One of 10 cars built by the St. Louis Car Co.

1923—The Chicago, North Shore and Milwaukee R.R.



One of 30 cars built by the Cincinnati Car Co. and the St. Louis Car Co.

HASKELITE MANUFACTURING CORPORATION

133 West Washington Street, Chicago

Railway Representatives:

Economy Electric Devices Co.,
37 W. Van Buren St., Chicago

Grayson Bros.
600 LaSalle Bldg., St. Louis, Mo.

Railway & Power Engineering Corp.,
Toronto, Ont., Canada

PLYMETL SIDE PANE