

ELECTRIC RAILWAY JOURNAL

HOUSTON THROUGH
MUSEUM AND CAR. HOUSTON
HOUSTON, TEXAS.

WILLIAM T. JACKSON, Director of Public Service for the city of Toledo. Mr. Jackson is well known for his active interest in behalf of city betterment, and he is now serving as President of the Ohio State Conference on City Planning. And as President and General Manager of Joseph Jackson & Son, one of Toledo's oldest and best known firms of general contractors, he has had a very direct part in the upbuilding of the city. He is also first Vice President of the Toledo Chamber of Commerce.



“It effectively protects the pavement”

“FOR some time we have been working on the problem of how to prevent rapid deterioration of pavement in track zones—and I believe we now have the solution.” This statement was made recently by William T. Jackson, Director of Public Service for the city of Toledo. In Toledo, the city rather than the traction company handles the paving of track areas.

“We use granite block pavement in the track area, but we have found that it is practically impossible to fit the blocks in tightly against the web of the rail. As a result, water and frost enter, and failure of the pavement follows. The flange of the wheel also frequently breaks off the nose of the block, or knocks the block out of place, causing it to pitch toward the rail.

“To overcome this condition, we have installed an asphaltic rail filler each side of the rail. This forms a water-tight bond with both rail and pavement, and

keeps the granite blocks away from the flange of the wheels. We find it effectively protects the pavement and makes a neat looking job. We are, in fact, so well pleased with the result that we plan to follow this practice in our future paving work.”

Carey Elastite System of Track Insulation was the material used to effect the improvement in pavement construction described by Mr. Jackson. Traction engineers all over the country today are advocating the use of the Carey system because it effectively protects the pavement and lowers maintenance costs. Noticeable reduction of noise also results where this resilient material is used to cushion the rails.

Write today for full particulars.

CAREY Elastite System of Track Insulation consists of a fibrous asphaltic compound, made in pre-formed slabs to fit any rail. It is easily cut, fitted, and driven into place with a sledge. Unaffected by moisture and temperature changes, and will outlive the track itself.

THE PHILIP CAREY COMPANY
Lockland, Cincinnati, Ohio

Carey Elastite
TRADE MARK. REG. U.S. PATENT OFFICE



SYSTEM OF TRACK INSULATION



Passenger traffic on the lines of the Altoona and Logan Valley Electric Ry. on which the new cars are used has increased 12% and more, in a large measure due to the improved facilities.



“The People are Pleased with Them”

THAT'S what Mr. S. S. Crane, Vice-President and General Manager of the Altoona and Logan Valley Electric Railway Company wrote about the new cars recently placed in service.

John Doe measures with his own yardstick. “The People” are not always appreciative of the troubles and problems of the transportation company. But they are quick to sense sincere effort to

improve their transportation facilities. Because Mr. Crane has held steadfastly to his policy that “the people be pleased”, more people than ever before are riding the trolleys today in Altoona. Because new, modern, light weight cars please the people, they are developing greater revenue and more cordial public relations.

New, modern cars, to “please the people” are a profitable investment.

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



1926

Westinghouse

X88787

The Thirteen modern light weight cars recently placed in service in Altoona are each equipped with four Westinghouse No. 510-A 35 hp. motors, and Westinghouse control. They are operated as one-man cars.

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No. 2

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Digestible

IN A chemical laboratory a few days ago the editor met a scientist engaged in analyzing food products. He explained how by analysis he could find out every constituent of the food and its exact amount. His purpose was to discover deleterious ingredients in apparently harmless food stuffs.

As he told how government experts are performing invaluable service in this way to guard the public health, it brought to mind a similar work that is done in the editorial office. Vast quantities of copy are sifted—most of it accurate, but occasionally with distorted statements and once in a while untruths.

The presence of such matter renders the printed word just as indigestible as does the presence of improper ingredients in comestibles. False statements are made not so much from an actual desire to mislead, but simply from carelessness. Too many writers fail to take time to investigate for themselves, but accept the word of some one else.

Certainly the reader has no time to investigate and analyze. That has to be done before the story reaches him. ELECTRIC RAILWAY JOURNAL assumes the responsibility gladly in order that its readers may be assured of the accuracy of the information presented in its pages.

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Successful Methods

Journal of Electricity

(Published in San Francisco)

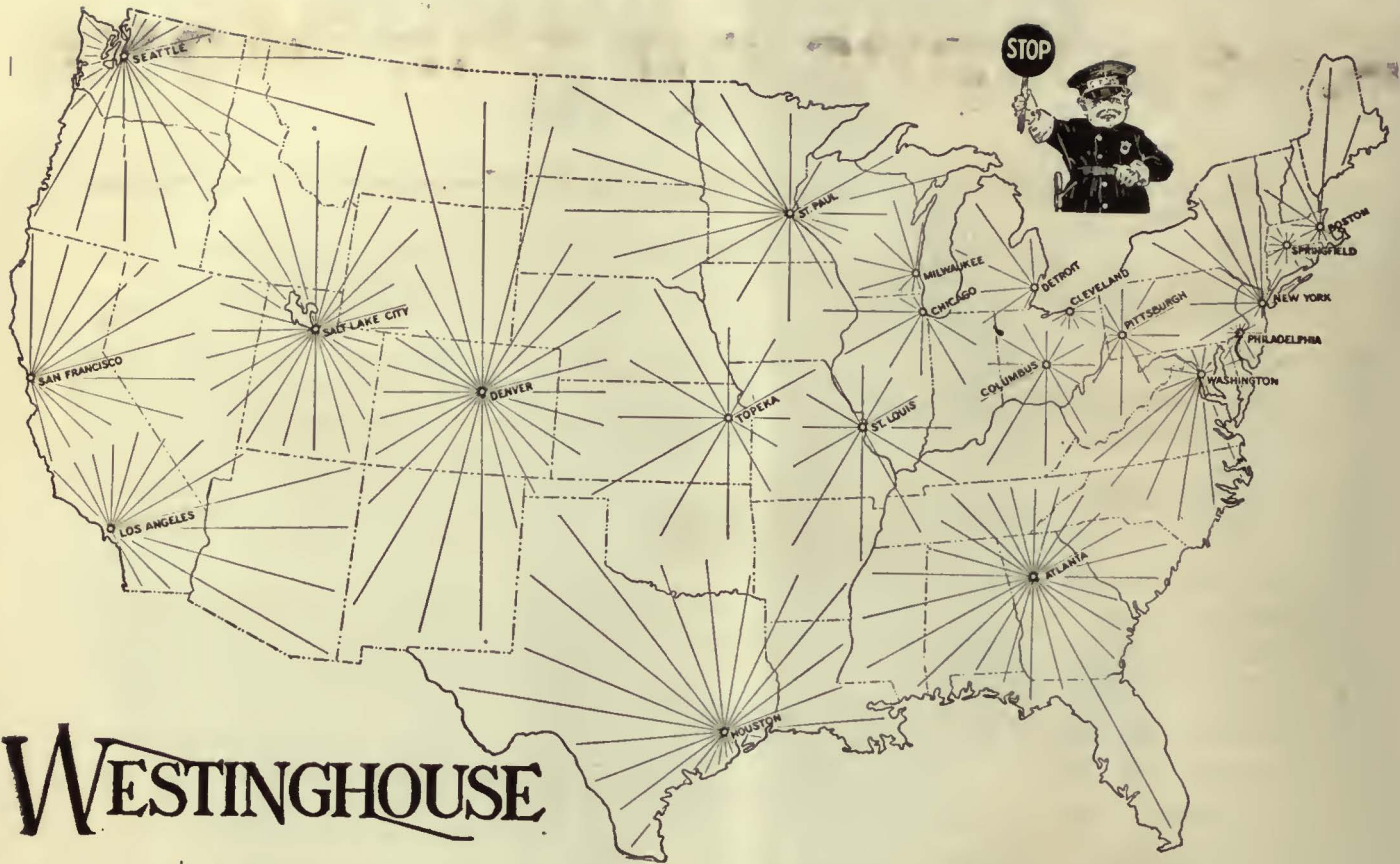
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(Published in London)

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WESTINGHOUSE

Automotive Air Brake Service Covers the Map

Branch offices of the Westinghouse Air Brake Company—located in the principal cities of the United States—are “service stations” for Westinghouse Automotive Air Brakes.

Westinghouse Air Brakes

- develop a retarding force sufficiently powerful for stopping even the heaviest car quickly, to increase safety and permit faster schedules.
- to provide automatic equalization, to minimize skidding and lengthen life of brake linings.
- relieve the driver of braking fatigue, to increase safety and utility.
- and permit the use of metal brake linings, to provide still greater safety and economy.

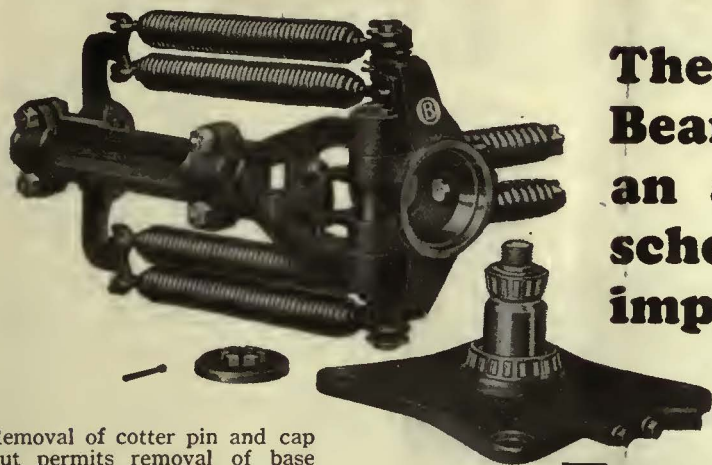
Here are men especially trained in this branch of our business; men able to demonstrate the advantages of Westinghouse Air Brakes for modern automotive vehicles; men skilled in the application and maintenance of Westinghouse Air Brakes; men available for consultation and assistance to users of Westinghouse Air Brakes.

These men are at your service.

WESTINGHOUSE AIR BRAKE CO.
Automotive Division, Wilmerding, Pa.



Keep Cars on the Move



The O-B Form 4 Timken Bearing Trolley Base is an aid in maintaining schedules and also in improving service

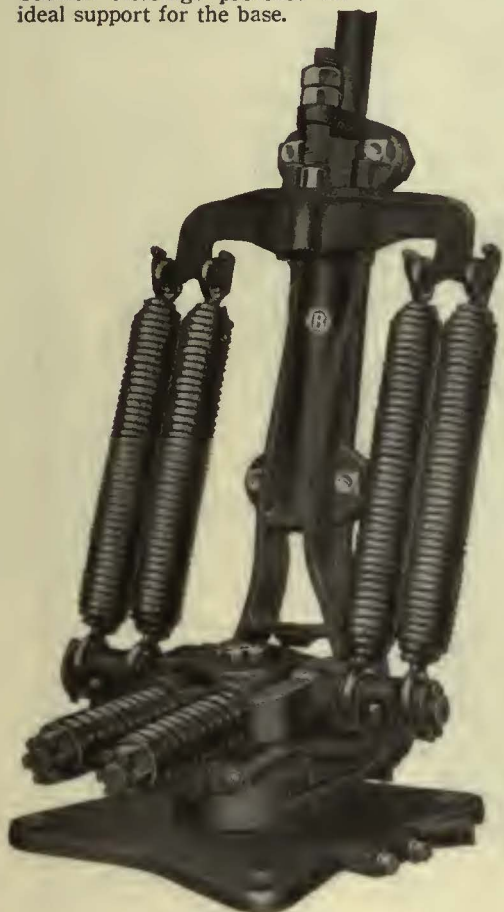
Removal of cotter pin and cap nut permits removal of base from pedestal. A perfect application of two standard size Timken Bearings provides an ideal support for the base.

THERE are far fewer occasions for service delays due to trolley pole dewirements, when cars are equipped with the O-B Form 4 Timken Bearing Trolley Base.

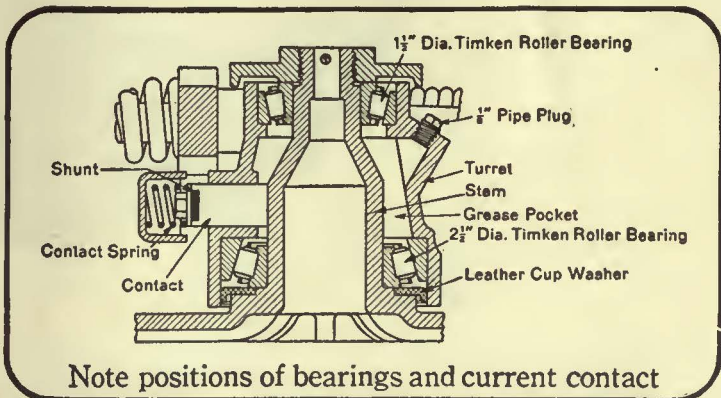
With a long-life bearing mounting noted for its free and easy movement, and a spring assembly that is perfectly balanced, this trolley base responds instantly to every variation of the overhead. The trolley wheel follows the overhead as faithfully as a hound dog does a rabbit—up grade and down, on curves and on the straightaway.

It is such performance at a remarkably low maintenance cost, that makes the O-B Form 4 Trolley Base the logical selection for the modern car. The complete details of design, construction and past performance are interesting. May we send them to you?

Ohio Brass Company, Mansfield, Ohio
 Dominion Insulator & Mfg. Co., Limited
 Niagara Falls, Canada
 135C



O-B Form 4 Base is equally suitable for city, interurban or freight service. Its light-weight yet strong and compact construction makes it ideal for city cars. And its special Pedestal Contact Brush has ample capacity to carry the current necessary for operating a number of heavy electric freight cars in trains.

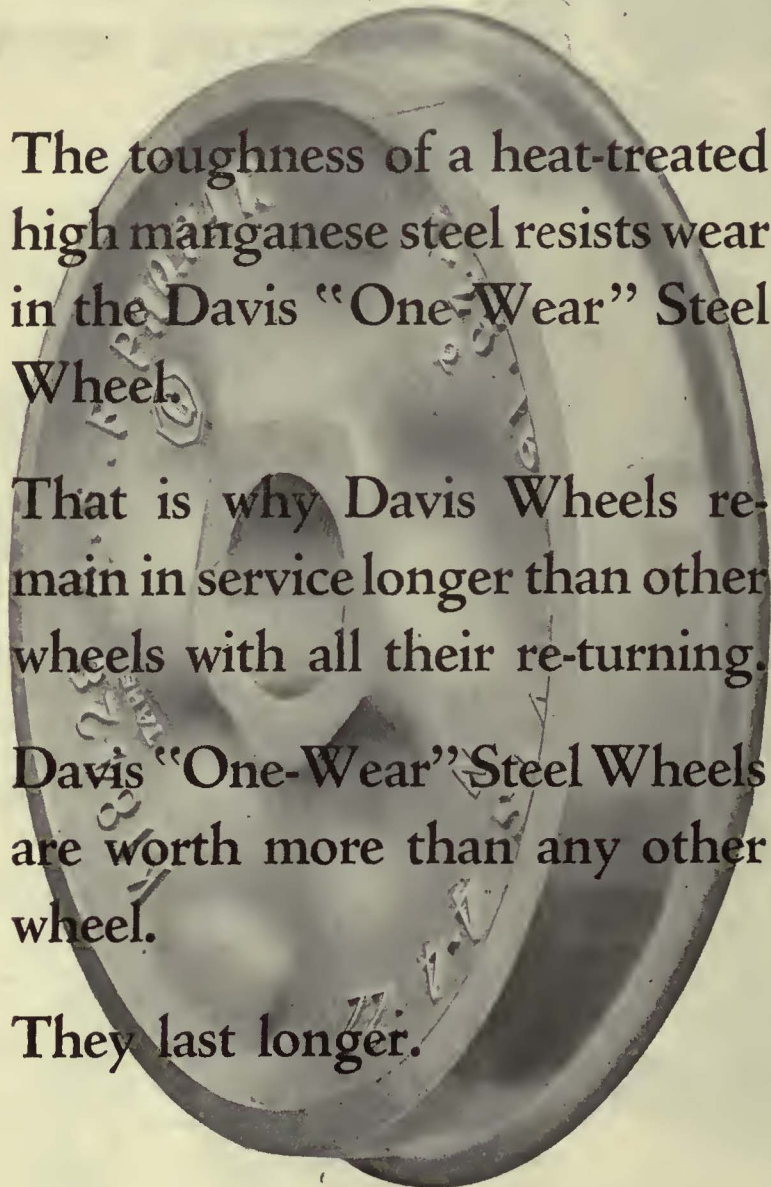


Ohio Brass Co.



PORCELAIN
 INSULATORS
 LINE MATERIALS
 RAIL BONDS
 CAR EQUIPMENT
 MINING
 MATERIALS
 VALVES

LONGER LIFE



The toughness of a heat-treated high manganese steel resists wear in the Davis "One-Wear" Steel Wheel.

That is why Davis Wheels remain in service longer than other wheels with all their re-turning.

Davis "One-Wear" Steel Wheels are worth more than any other wheel.

They last longer.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

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Steel Twin Tie Installation
The Potomac Edison Co.
Waynesboro, Pa.

50% of the Rail Base is Supported by Twin Ties

Twin Ties, on the maximum recommended spacing of six feet center to center of ties, provide a three feet long by thirteen inch wide bearing plate every three feet. Therefore one-half of the rail base is supported.

This valuable feature of twin tie construction is one of the reasons for the success of this design. Others, such as the saving of excavation, concrete and labor, back up quality construction with economy in first cost that often makes Twin Tie Track cost less than wood ties in ballast.

What Shall We Send You?

Catalogue
Quotations
Proposal Drawing
Estimate, 1925 Detail
Costs

The International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

Renewable Track — Permanent Foundation



Enduring

Quality Ties
Ready for Shipment

International Creosoted Ties

"The wooden tie—with reasons why!"

Life insured car tracks!

IT'S a pretty serious matter, costly as well as annoying, when a busy street has to be dug up for track renewal. That's why it pays to use ties which will last as long as the rail itself.

International Creosoted Ties, of carefully selected timber, thoroughly impregnated, are averaging twenty years' life on heavy traffic railroads. Compared with untreated wooden ties, the cost is only slightly more and the life is several times as great.

With *International* Creosoted Ties, you gain all the advantages of wood, resiliency, noiselessness and easy replacement, while avoiding the rigidity and high cost of mechanical substitutes. It's track life insurance at nominal cost.

*We are making shipments at attractive prices to all points in the United States
Get our quotations*

International Creosoting & Construction Co.

General Office—Galveston, Texas

Plants—Texarkana, Texas Beaumont, Texas
Galveston, Texas



KEYSTONE CAR EQUIPMENT

On the new P. R. T. cars for the Sesqui crowds

To aid in handling the extra volume of traffic attracted by the Sesqui-Centennial Exposition, the Philadelphia Rapid Transit Company recently purchased 50 new cars.

Shown at the right are the Keystone Devices—headlights, signs, car signals and registers—that make for efficiency in the operation and maintenance of these cars.



Golden Glow Headlights project a soft yellow beam that easily penetrates rain, fog, dust and darkness. Made for every requirement.

BLOOMFIELD

Hunter-Keystone Destination Signs are an effective way "To tell the public where you're going." Designed to fit any available space.

Faraday Car Signal Systems fulfill the requirements for convenient reliable service. Supplied in many styles and sizes.

International Fare Registers provide a simple, accurate and reliable method of checking the number of fares collected.

ELECTRIC SERVICE SUPPLIES Co.

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1123 Bessemer Building

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88 Broad St.

SCRANTON
316 N. Washington Ave.

DETROIT
General Motors Building

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



The trend of the times is toward greater comfort

Transportation is no exception to the general demand of the public for comfort—and then more comfort.

Hale-Kilburn Seats are designed with this point always in mind. But at the same time they have that durability so essential in reducing maintenance costs. Send for full information.



De Luxe Bus Seat
Type 208

This De Luxe seat has divided back, spring cushions and air cushion pads. Furnished with either leather or imitation leather upholstery.



De Luxe Car Seat
Type 392-EE

This fine type of interurban car seat has extra high three-part headroll and mahogany capped arm-rest. Furnished with plush upholstery or other material as specified.

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

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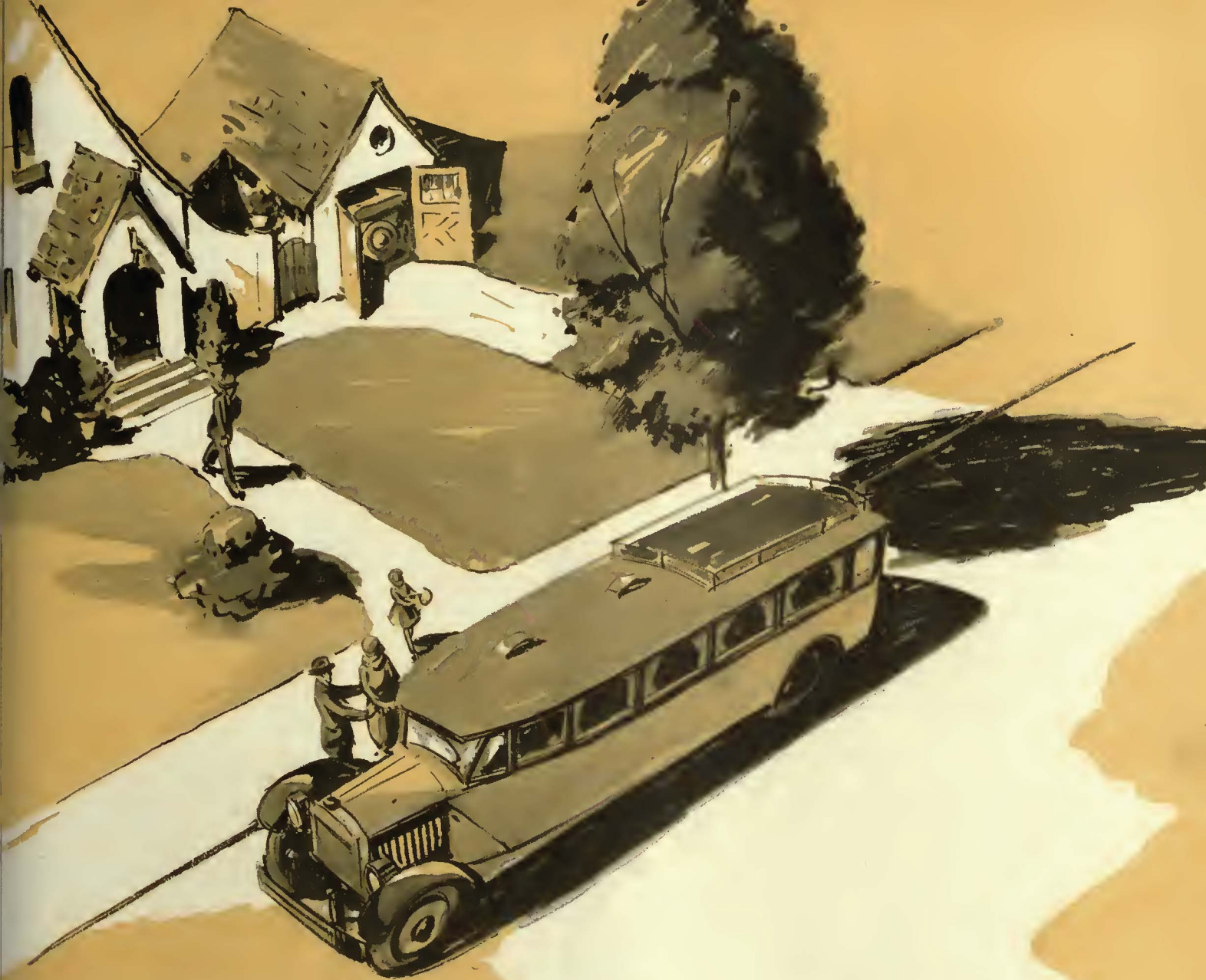
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Kilburn**

SEATS



*There is nothing so luxurious
as a private car — except
a luxurious bus!*

And Lang Bodies, by their beauty of line and luxurious appointments, create a private car atmosphere that suggests to many riders the wisdom of taking a bus rather than taking their own car through traffic.

LANG BODIES

create new passengers



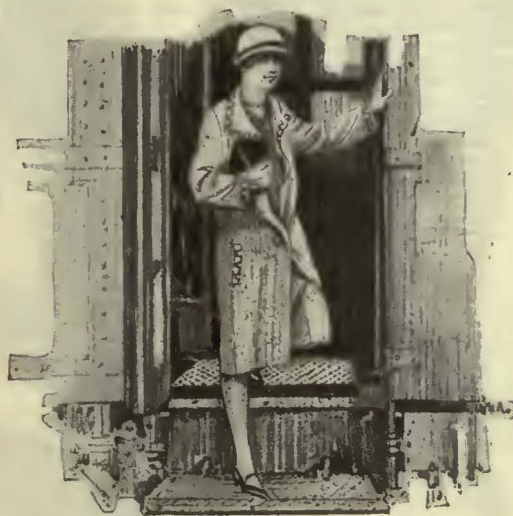
This rider is as comfortable as though she were in her own sedan. She is one of thousands who are filling Lang Bodies; attracted first by beauty of design and won over as a steady patron because of the many characteristic points of refinement that contribute to comfort and safety.

THE LANG BODY COMPANY
CLEVELAND, OHIO

*"After all—
it's the Setting
that counts!"*



In the Front—Out the Rear by Using the *Automatic Treadle*



BOTH front and rear doors of cars can be operated by National Pneumatic Treadles.

The door is opened by the weight of a passenger on the treadle. The safety interlock, however, prevents this opening of the doors until the car has come to a dead stop.

When the last passenger is off the step, the door closes and a light flashes before the operator, in front. The same safety interlock prevents the car from starting before the doors are tightly closed and the signal light has flashed.

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Executive Office, 50 Church Street, New York

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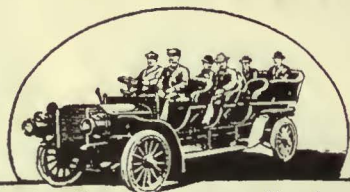
Anyone can follow suit-but

Single-motor drive was adopted for the Mack Gas-Electric bus in spite of the universal use of two motors by other American builders. This departure was made for good reasons—engineering reasons, economic reasons—and for distinct operating advantages.

Mack has refused consistently to follow conventions slavishly. Throughout Mack bus construction there are original and exclusive design and manufacturing features adopted because of their demonstrated superiority. *One-motor drive* is just one of these.

The single motor transmits more power than two because of lower electrical and mechanical losses which obviously are the results of simplicity. In addition, weight is conserved, accessibility is enhanced and maintenance considerably reduced.

The acme of accessibility is secured through the central location of the motor, reached for inspection and attention to brushes through trap-doors in the bus aisle. All electrical

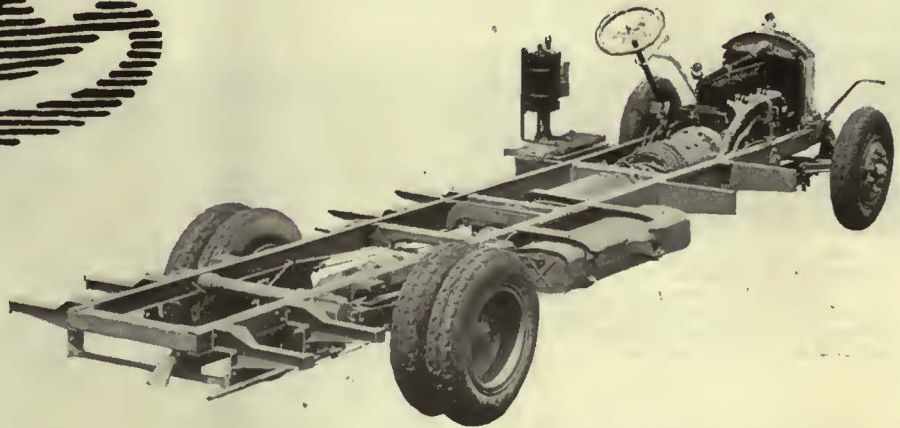


The first bus was a Mack
the first Mack was a bus

Mack-Made Buses

25-Passenger City Type
 29-Passenger City Type
 25-Passenger Parlor Car
 25-Passenger Suburban Type
 29-Passenger Suburban Type
 25-Passenger Gas-Electric
 29-Passenger Gas-Electric

- one-motor drive



Mack again stepped forward

units are removable from below without disturbing adjacent assemblies.

Shock-Insulation in the Mack Gas-Electric does not mean protection from electrical shock; it means protection from mechanical shock—road impacts, twisting strains and vibration to which all motor vehicles are subject. Every moving part is insulated from the frame by blocks of live rubber—Mack Shock Insulators. Three of them support the engine, two support the rear end of the generator (its front end is supported by the engine bell-housing), three more support the motor and eight others on the spring-ends take care of the axles. In addition, the Mack Rubber Torque Insulator cushions the drive from the engine to the generator, damping out the annoying and destructive torque vibration set up between the engine and the generator armature.—Just a few of the exclusive superiorities of the Mack.

The Mack direct factory branch nearest you will be glad to give further particulars and introduce you to the superior riding and control qualities of this newest member of the Mack family.

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

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

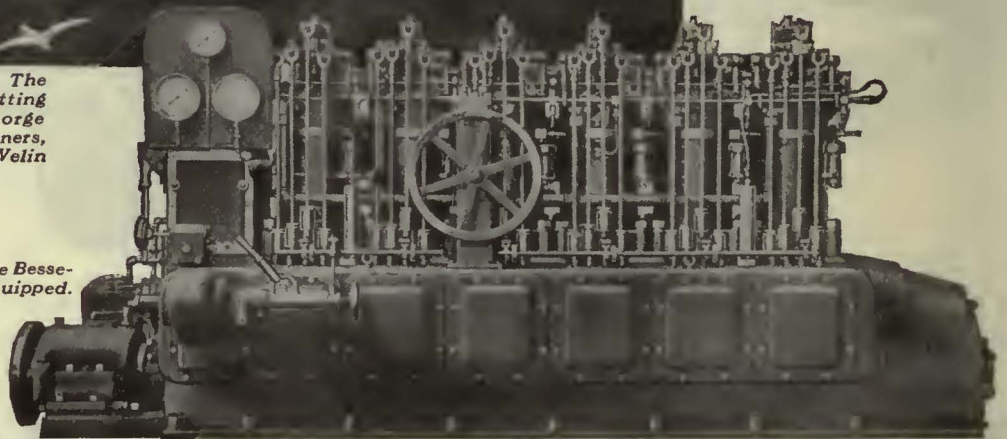
The **Mack** Bus

Now—Diesel Engines with Timken Bearings



Timken Bearings were used by The Bessemer Gas Engine Co. in fitting the "Alpha." Owner, Mr. George Marshall Allen, New York. Designers, Henry J. Gielow, Inc. Builders, Welin Davit & Boat Corporation.

A 125-150 h. p. direct reversible Bessemer Diesel Engine, Timken-equipped.



No responsibility is too great for Timken Tapered Roller Bearings. Latest proof is the use of Timkens in Diesel engines, by The Bessemer Gas Engine Co., one of the great producers of internal combustion engines.

Only the most exhaustive comparative experiments by Bessemer certified Timkens for numerous Diesel mountings, including the marine propeller thrust position of a costly private yacht.

Speeding this 100-ft. vessel, of 250 h. p., at 12 knots or more, the Timken Bearings must and do perform infallibly. With their easy-rolling properties, tapered design, Timken-made steel, and *POSITIVELY ALIGNED ROLLS* Timkens bring power economy, smoothness, freedom from attention, and permanent precision.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN

Tapered

ROLLER BEARINGS



Lower Running Expense? Ans.: Modern Cars!

The question of operating expense is always a timely one for consideration. The answer lies in equipment that requires less power, less labor, and less maintenance. In other words, you can lower expenses by equipping your lines with modern cars.

Cummings Car and Coach Company

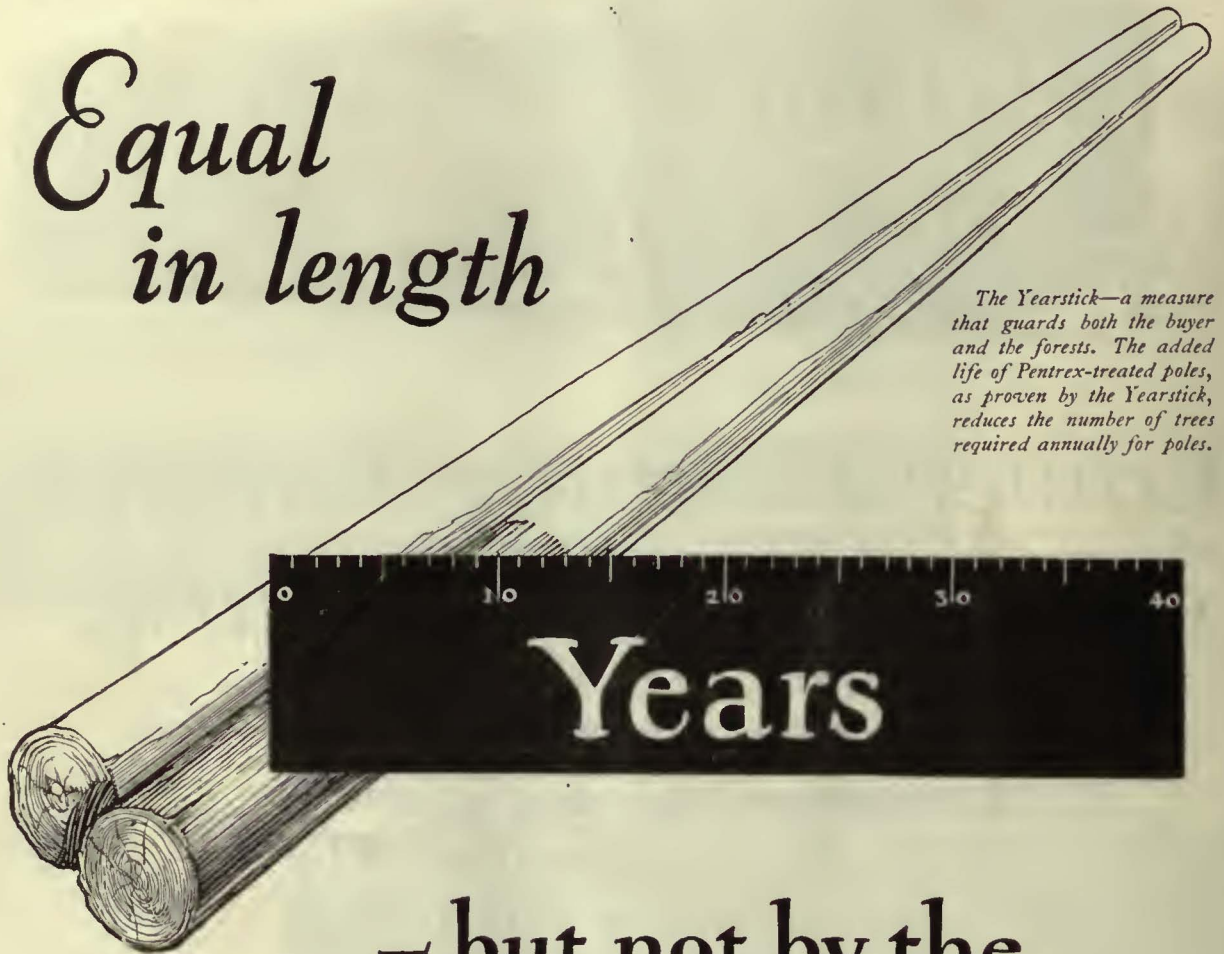
Successor to McGuire Cummings Mfg. Co.

111 W. MONROE ST., CHICAGO, ILL.

Light Weight City and
Interurban Cars
Single and Double Trucks

and—the Cummings Gas-Electric Motor Coach

Equal
in length



The Yearstick—a measure that guards both the buyer and the forests. The added life of Pentrex-treated poles, as proven by the Yearstick, reduces the number of trees required annually for poles.

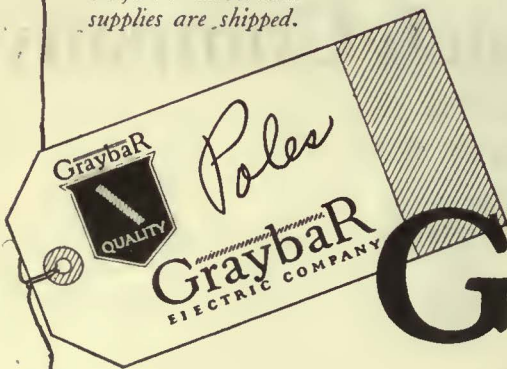
— but not by the
Yearstick

TWO POLES. The yardstick declares them the same length. But that magic measure, the Yearstick, shows one far longer than the other—in years of service.

That pole has been Pentrex-treated. As the preservative was forced into the wood, years of added service entered the pole—but only the Yearstick can detect their presence. Measure the poles you buy with the Yearstick as well as with the yardstick.

And Graybar Electric can supply you with poles that check with both.

The Graybar quality tag—under which 60,000 electrical supplies are shipped.



GraybaR

ELECTRICAL SUPPLIES

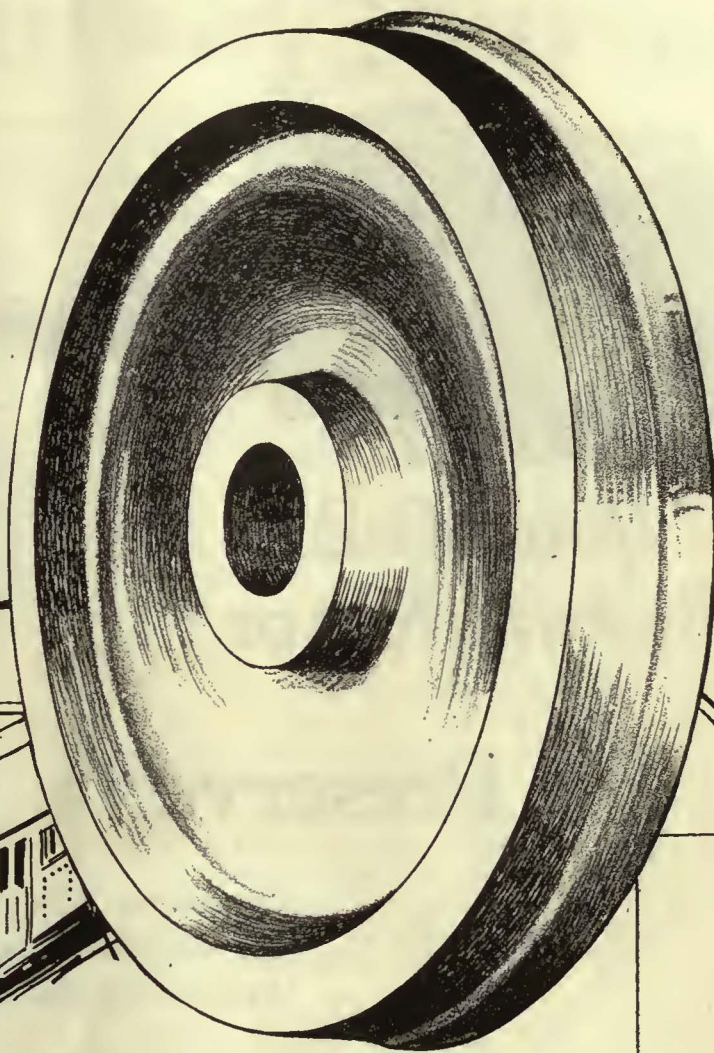
Successor to *Western Electric* Supply Dept.

Offices in 56 Principal Cities. Executive Offices: 100 East 42nd Street, New York

3

Important Questions

that govern the value of wheels in Electric Railway Service



Volumes might be written on the design, construction and other features of wheels, but their true value will always be governed by the manner in which they answer three important questions:

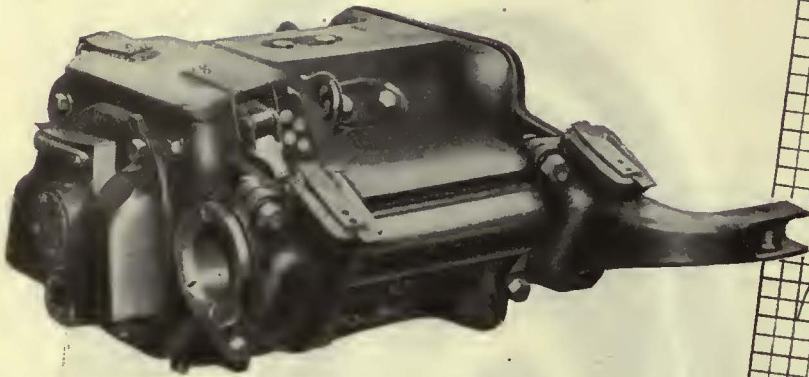
1. Are they *safe*?
2. Are they *dependable*?
3. Are they *economical* in mileage cost?

Gary Wheels offer the utmost in *safety* because of their one-piece wrought steel construction; they offer as evidence of their *dependability* the fact that they operate for years without repairs or replacements of any kind....and as for *economical mileage cost*, they refer you to the proper department of any of the many railroads that have kept records concerning them. Our wheel specialists are at your command.

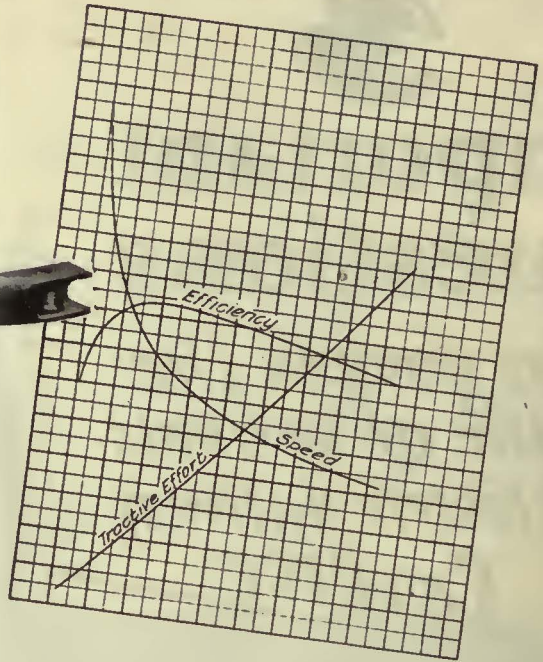
Illinois Steel Company

General Offices, 208 S. La Salle Street

Chicago, Illinois



Your G-E Railway Motor



Preserve its characteristics

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

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

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



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



For

Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

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

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, Editor

Volume 68

New York, Saturday, July 10, 1926

Number 2

The Surprising Feature of the Cleveland Shopping Survey

ELECTRIC railway men are so familiar with the principal causes and effects of street congestion that they do not realize how ignorant the general public is on these matters. Take, for instance, the effect of parked vehicles on a downtown street. It is obvious to the railway manager that a line of standing automobiles along the curb or along both curbs of the street cuts down its useful width by just that amount, consequently general parking hampers the movement of all traffic. He does not appreciate that the downtown merchant often looks upon the rows of parked automobiles as representing large numbers of customers who are making purchases within the district.

Nothing will help more to clear up this situation than a series of surveys such as that recently completed in Cleveland. The purpose of the Cleveland survey was to learn the methods of transit to the downtown stores in the city used by customers on several days. Similar surveys have been made in other cities, but for the most part they have been fragmentary in character. The Cleveland survey stands out prominently in three ways: It was quite comprehensive as it included most of the leading downtown stores in the city. It was conducted by the merchants themselves, and it is of recent date. The result found, that an average of only one person in five who visited the stores on the three days of the test came in a private automobile, is not a surprise to most men familiar with the situation, but proved to be very much of a revelation to the merchants of Cleveland. It is probable that remedial action, with the approval of the retail business interests, will follow the results of the test.

The really surprising information developed by the survey in Cleveland, however, is not the proportion of customers reaching downtown retail stores by electric car and auto. It is that this rather simple method of establishing a most important fact has not been utilized to a greater extent in settling similar questions in other cities. There have, of course, been other surveys of a like nature, but there have been very few of them and nowhere near as many as the number of cities where the question of parking in the downtown streets has been and is very active.

The Cleveland example also points to a way of making the survey both comprehensive and very convincing. This is by letting the merchants make the count with their own forces, though in Cleveland the railway helped to organize the plan and largely bore the expense. There is no more certain way of establishing any truth in the mind of a person than that of letting him reach it by his own deductions or action. This is the basis of the laboratory method of teaching physics and chemistry. It should work equally well with a downtown retail merchant. Such a man under the false impres-

sion that most of his customers reach his store in their private automobiles usually will not be convinced of his error by statistics from other cities. Even figures from a neighboring store may not be convincing. The merchant may think that his own clientele is more exclusive and belongs largely to the limousine-owning class. But let him make his own tabulation at his own store door by his own employees and he no longer can be blind to the truth.

There is a corollary to the problem just demonstrated, which should also not be forgotten by the downtown merchant. This is that if custom is impeded in its flow to his store it will go to those which are reached more easily. In other words, if street car passengers, who make up the bulk of the customers, find that it takes too long to get downtown to shop they will patronize their neighborhood shops. This would, of course, mean a loss to both downtown merchant and trolley company. In this their interests are identical. Hence it should not be difficult for them to get together.

For the benefit of the industry there should be many polls of shoppers like that in Cleveland.

No Other Course Was Open to the Interborough

NO CAUSE for quarrel can be found with the position taken by the management of the Interborough Rapid Transit Company, New York, in the controversy with its motormen and switchmen who have gone on strike. These men elected to secede from the Brotherhood of Interborough Employees, with which body the company had just arranged a renewal of the existing working contract. This was, perhaps, their privilege, but it was also their obligation to accept the consequences of that action. On its part the company was not hasty. The remarks of Mr. Hedley referred to in this issue make plain the position of the company. The grounds for his action, backed by the brotherhood as a whole, were that for him to consent to arbitrate any matter with any group that had left the brotherhood would be a breach of faith. So the merits of the issue hinged on that ethical point. The company did feel, however, that the wage demands were exorbitant, and one of its spokesmen expressed the opinion that an impartial board would find that the wages now paid were adequate. There seems no reason not to accept this as true.

The good offices of the Transit Commission were sought as mediator but without avail. It is to the credit of that body that it lost no time in idle palaver when the issues at stake were made plain and that it arranged to secure the co-operation of the other transit carriers to assist in the emergency by increasing their facilities. The concern of that body, apart from attempting to secure an amicable adjustment, is to see that the public

suffers a minimum of discomfort. This it did with unusual results.

Perhaps the best answer to the charge of the inadequacy of the present rates of pay for the motormen and switchmen is found in readiness of other men to accept the wage scale that the men who went out purport to regard as inadequate. Defections from the ranks of the strikers further attest the adequacy of these rates and indicate that a very large number of the men who went out were carried away by emotions which in their more sober moments they were able to analyze impartially. Last-minute news indicated that the strikers would seek affiliation with the American Federation of Labor. That in itself was significant of the feeling of isolation that had taken hold of the strike leaders, an isolation best expressed in the words of one of the leaders late on July 8 that the "strike is still on." A strike that is still on and is effective is its own best spokesman. Some of the New York papers that cater to the sensational went to great lengths to capitalize the strike, but the public was apathetic. It understood the issues too well to permit itself to become demonstrative—except in so far as its attitude reflected impatience at the inconvenience which the ill-advised action of the men on strike had caused them to experience.

Tax Reductions Offer a Saving Without Investment

IN THIS issue is found an abstract of Economist Vickers' theories on taxation as given before the Central Electric Railway Association. They are not new, but his application of such ideas to the railway industry are. He holds forth hope that concerted action will bring relief, but insists that railway managers must first understand these principles. Here is an opportunity for a nationwide policy and a nationwide action. For years public service properties have paid taxes on the physical value of the property owned or used in public service. Other properties owned by our political subdivisions do not pay taxes because it would be taking the money out of one pocket and putting it into the other. While the ownership of our utilities is generally in private hands the conduct of their corporate existence is under public control in one way or another.

The natural conclusion might be that the utilities should not pay taxes at all. But not so in the theory of which Captain Vickers is a proponent. The ability to pay is the only correct basis to use, he says. This is analyzed still further into a combination of gross and net revenue basis with suggested values worked out for several cases.

The opposite view of boosting the rates to pay the tax has proved impracticable. There is an economic balance that limits this scheme, as many operators know. The cost of mass transportation must be kept down as low as may be to maintain the volume—and without volume a property is in a bad way.

It is one thing to work out a theory and another to carry it forward. Captain Vickers has done that too in several instances. With his abundance of detailed information and his ability to put it across before managers or tax commissions, he can be of material assistance in specific cases.

Here is an opportunity to save several per cent of gross without the investment of a dollar of new money.

Infraction of Traffic Regulations Is a Growing Evil

OPINIONS may differ as to whether or not traffic regulations in the average city are well adapted to present congested conditions. There can be no doubt, however, that infractions of these regulations are becoming more and more frequent. Like most bad habits, this disregard of the law grows upon those who practice it.

Passing another vehicle on the wrong side is thought by many drivers to be a creditable achievement if one gets away with it. Beating the traffic officer's whistle at a street intersection gives the average automobilist a glow of inward satisfaction. Parking in a restricted area is considered quite a feat if one does not "get a ticket." So it goes. Violation of traffic regulations seems almost like a game, the winner being the driver who disregards them the greatest number of times in a given period.

Nobody stops to analyze the results to himself of this general habit of violating the traffic regulations. For once that the automobilist gains some slight advantage through his own transgression, he suffers delay a dozen times on account of the transgressions of others. Consider, for example, the man who goes over to the wrong side of a two-lane roadway in order to pass the vehicle ahead of him. Where traffic is dense he seldom succeeds in this attempt, but usually loses in his own place in the column and effectually blocks movement in the opposite direction. Yet nearly everybody does this when opportunity offers.

Even more serious is the effect of this attitude on public transportation vehicles. Instances can be seen every day where one man in a private automobile blocks a street car or bus carrying 20 to 100 people. Perhaps the man who never uses public transportation vehicles can afford to be indifferent about blocking traffic. But how few people there are who come in this category. While a great many people own automobiles, the number who use them habitually when traveling on congested city streets is comparatively small. Traffic counts have shown time after time that upward of 75 per cent of the traffic is being carried by public conveyances. The man who selfishly delays them today is likely tomorrow to be a passenger indignant at a similar action of some one else. This is a point which can well be emphasized by the transportation companies in their publicity work.

Detroit's Mayor Is Right About the Jitneys

MAYOR SMITH of Detroit has taken a strong stand on the jitney in Detroit. That is as it should be. Despite this the issue has been complicated by further court action. Offhand it would seem that there could be only one answer to the question—the answer Mayor Smith has stated most emphatically. He wants the present jitney ordinance strengthened and the jitneys thrown off the streets altogether. It is an answer so preponderant in the weight of the evidence behind it that it appears queer the issue should arise at this time. How the question did arise anew is best told in the article elsewhere in this issue.

The plea does seem a little ingenuous that was made by the spokesman for the jitney drivers, to the effect that the move was unwise from a civic standpoint

arbitrarily to order \$500,000 worth of rolling stock off the streets when transportation facilities are none too plentiful." Opposed to this, of course, is the statement of H. U. Wallace, manager of the municipal railway, about the arrangements he has made for taking over the jitney traffic. But the action of the city was not hasty. The case has long been in the courts and the jitney men had fair warning. For the present the jitneys are still running under a temporary restraining order. It is another respite they have achieved—nothing more. In the end the Mayor's idea of entire elimination of the jitney will prevail. Particularly in the case of a municipal railway is his argument irrefutable that if the railway is to give the best possible service at the lowest possible fare it should have a monopoly. In no other way can that end be secured. The strange thing is that at this late day it should be necessary to reiterate this self-evident fact. As the Mayor has so aptly pointed out, Detroit, if it needs to do anything, needs to strengthen its anti-jitney ordinance.

Ways Exist for Saving

Some of the Little Interurbans

LAST year witnessed the dropping out of service over a number of miles of lightly traveled interurban track. This spring has seen some more of the investment in the smaller interurbans wiped out. Does this mean that the small interurban roads have had their day? A few instances like this can hardly be as significant as the failure of the Union Bus Terminal at Indianapolis, and no one will say that the day of the motor bus is at an end because its use was not applied wisely in some instances.

Too many of these unfortunate interurban lines were built with the hope of creating an abnormal riding demand in a community too limited in population and possibilities really to need them. Some of these smaller routes have been kept in operation by means of common financing along with more successful trolley lines. Perhaps for a time they paid their way, for the novelty of the new means of transportation may have brought on a period of overstimulation, but in such a case the let-down was all the harder.

If these little fellows are not all doomed, what can save them? That depends somewhat on the individual road and on the community it serves. The possibilities of passenger service in a purely agricultural community are rather meager, yet a route may be so situated that it can give a superior type of freight service. In urban communities the prosperity of these lines depends almost entirely on the prosperity of the various industries in the cities served.

If there was a time in these unsettled years when an interurban management could calmly map out plans for the future it is now. Wages and material prices have approached some semblance of stability, many of the misunderstandings under commission regulation have been cleared up, and the limitations of bus competition have been pretty well demonstrated. In addition there are examples of what many successful managements have been able to do by extensive modernization of equipment, roadbed and terminals. So there is precedent for and a record of what to expect from almost anything the management may want to try.

These small interurban lines need not die off. If there was something more than a mere gamble that set them going in the first place, it must still be there if the right means are used to give it new life.

Constructive Thinking Just as Prevalent as Ever

"THERE'S nothing new under the sun," sang the bard. Perhaps he dealt with things spiritual rather than material, but even on this ground there may be found those who would be disposed to question his words. In the field of invention, for example, we find that genius still manifests itself in new and varied garb. Years ago we were told that all was up with the inventing business; that everything worth developing had been trotted out and placed on exhibition and that naught was left for the erstwhile man of ideas save to spend his declining years in saddened retrospection. But the proponents of this fallacious reasoning have been confounded. Today more worth-while ideas are born per minute than ever before.

It would not seem reasonable to suppose that the electric railway industry has escaped this well-spring of constructive thinking. There have been and are many forward-looking men who have gazed on the business of transporting their fellows and found it good. From these sources have come the inspirations for the Grand Rapids cars, the Philadelphia plan for co-ordinating every conceivable form of public transportation, the C.E.R.A. standardized freight cars, the Pittsburgh plan for rewarding employees who submit valuable suggestions—in short, all of the progressive movements which have tended to give the lie to the dirge that the industry is dying by inches. But there is ample room in the choir loft for many more singers with persuasive voices. And there is also a need for a more keenly attuned ear on the part of many railway managements, for often the finest singer renders his *magnum opus* in pianissimo.

Ideas are to be had for the taking. There should be no wilderness requiring the strident shouts of a prophet. In a field of activity which has lagged behind, for whatever reason, there is no room for petty bickering, for small thinking, and especially for executive deadwood. Invention is dead—Long live Invention!

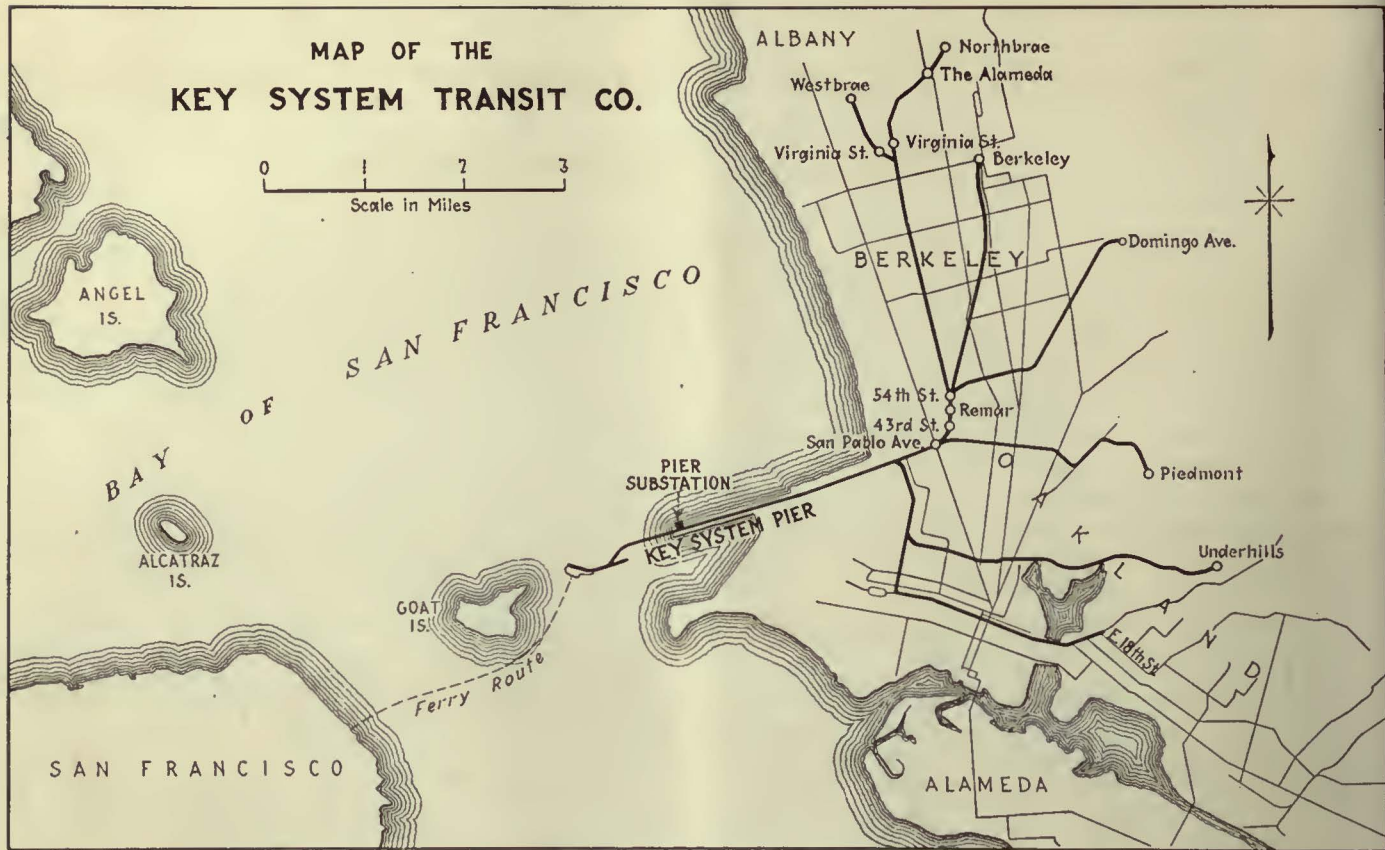
Cleveland Convention

Bids Fair to Exceed All Others

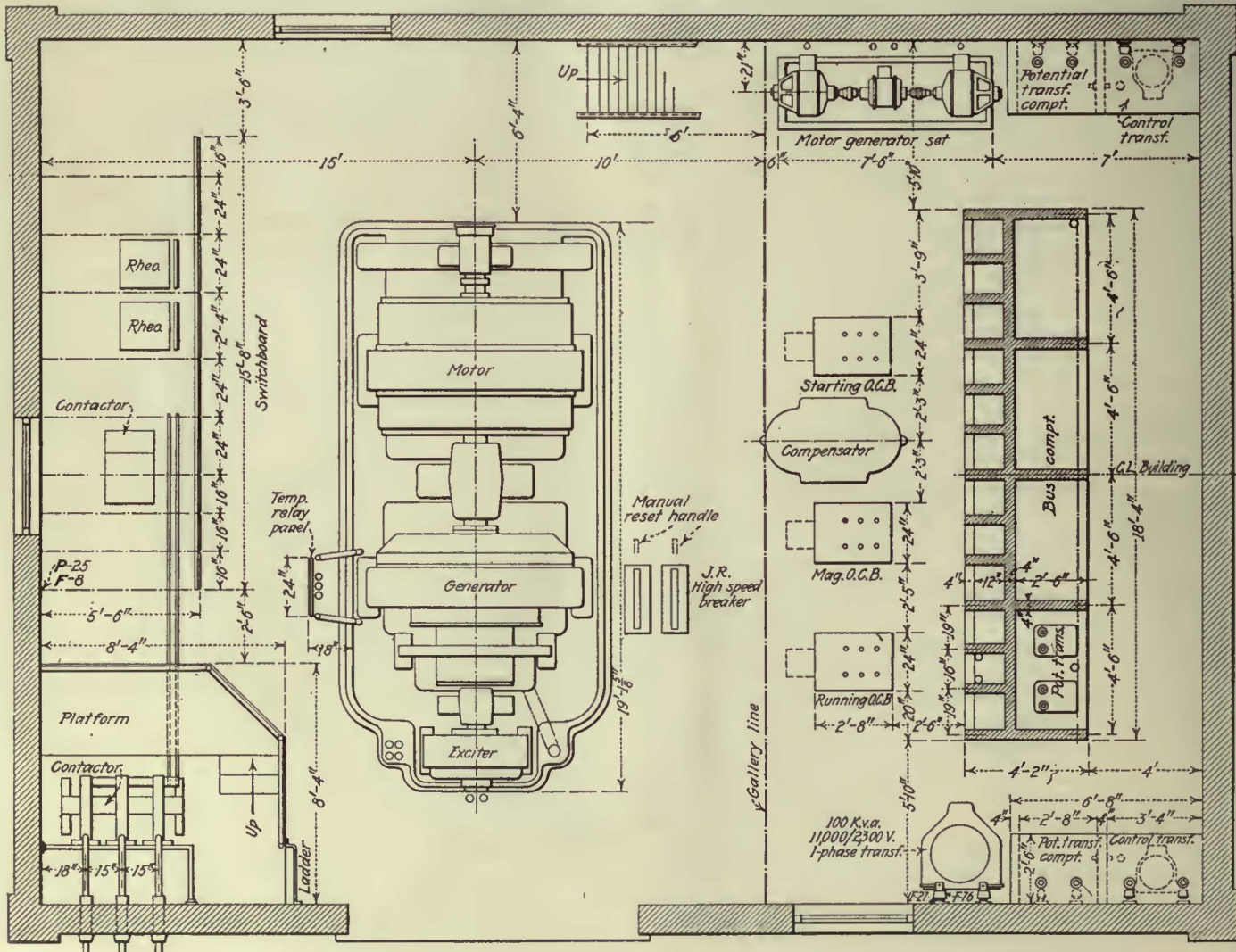
EXPECTATIONS that the Cleveland convention, to be held next October, will be the largest ever held by the American Electric Railway Association now appear to be more than justified. At the meeting of the exhibit committee held in Cleveland this week it was found necessary to revise the arrangement of the exhibit space to care for the requests already made. This action was taken even though the original plan for the convention called for a considerable increase in space over that sold at Atlantic City last year.

Plans for the technical program have not yet been announced in full, but it is to be assumed that the papers and addresses will be fully in keeping with the rest of the arrangements. The improved outlook in the industry and the many problems that merit discussion will prompt many to do their part toward making this convention the greatest in the industry annals.

It should be unnecessary to urge attendance at a convention such as this. Geographically, the location should attract many who have not been present at meetings in recent years. Instead of bringing up arguments why one should go to the convention, this year it is going to be the reverse—and it will be difficult to find reasons why one should not go to Cleveland.



Outline Map of the Key System Transit Company Showing the Location of the New Pier Substation



Ground Plan of the Pier Substation Recently Put in Operation by the Key System Transit Company

Key System Transit Company Completes 1,500-Kw. Substation

Motor-Generator Used with Automatic Control Equipment that Allows 300 per Cent Overload Until Windings Reach a Predetermined Heat, at Which Point Load Is Automatically Relieved to Prevent Overheating — Set Can Also Be Controlled from Remote Point

By H. P. Bell

Chief Engineer Key System Transit Company, Oakland, Cal.



Where the Key System Transfers Its Passengers to the San Francisco Ferries, 3 Miles Out in San Francisco Bay

The Oakland and Berkeley hills can be seen in the background. The new 1,500-kw. substation constructed to handle this important traffic can be seen halfway inland toward the shore. It is located about at the point where the wooden trestle joins the causeway

RECENTLY an interesting application of automatic substation equipment has been completed by the Key System Transit Company of Oakland, Cal. This system is part of the company's trans-bay service between San Francisco on the peninsular side of San Francisco Bay and the nine different cities which are served on the continental side of that body of water. This trans-bay service consists of a combination ferry boat-interurban train service in which passengers starting from San Francisco ride a distance of 2.9 miles by ferry boat and then transfer at the Pier Terminal to one of a number of trains bound for diverse destinations in the continental or East Bay territory, as shown on the accompanying diagrammatic route map. The Pier Terminal is located at the extreme westerly end of a pier which extends approximately 3 miles into the bay from the continental shore line. This pier is composed of about 2 miles of solid earth fill and 1 mile of trestle structure.

Trains consisting of from one to eleven cars leave the Pier Terminal and follow one another on a 50-second headway. Upon reaching the mainland the lines fan

out to their respective destinations. At the same time that each set of trains is leaving the Pier Terminal with passengers from San Francisco another set is arriving with passengers who transfer from the trains to the ferries bound for San Francisco. In this manner 638 trains per day and 20,000,000 passengers per year are handled through this throat of the system. It was to meet the exacting demands for proper power service to this most important part of the system that the new substation was installed.

This application called for a most reliable installation which would operate successfully on large overloads for short periods, and when overloaded to the safe temperature limits of the equipment, would "back off" from the load but still hold operating voltage on the line until a sufficient time interval had elapsed to reduce its temperature, and then again take up its overload, if necessary. Thus a motor-generator set, with shunt-wound generator, with special control and other features described later, was selected to meet the requirements of this particular application. The installation as now completed will be able to handle the future



A Four-Car Train of the Key System Transit Company Passing the New Substation Located at the End of the Earth-Filled Portion of the Key System Pier Well Out into the Middle of San Francisco Bay

development of this portion of the system by the addition of forced ventilation when required.

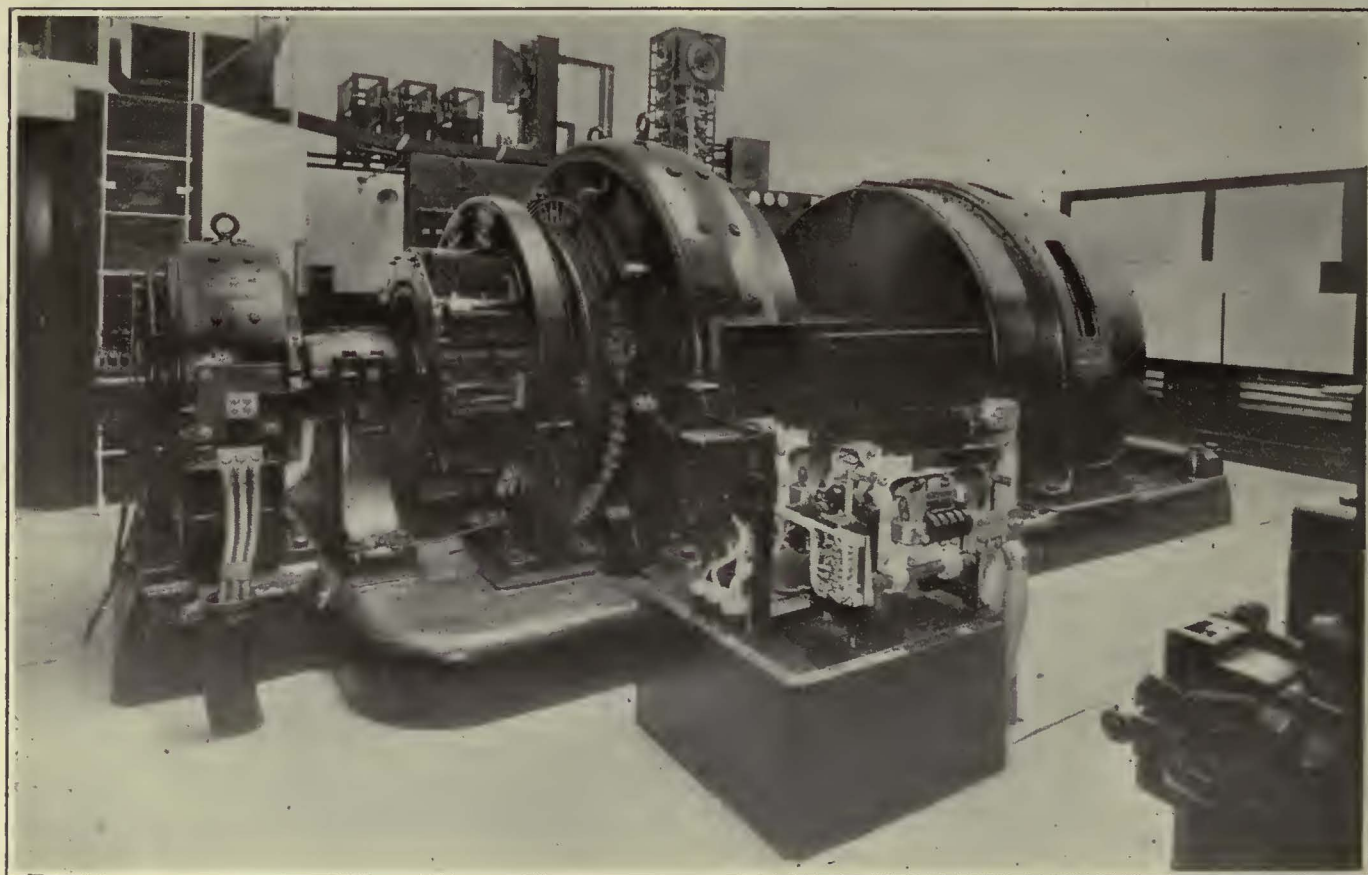
Addition of this station permitted the removal of \$11,000 worth of copper feeder cable and decreased the feeder losses in this section from 22 per cent. to 9.6 per cent. The operating voltage was also increased, which allowed a higher speed of operation of the trains, thus increasing the track capacity in this congested territory by 11 per cent. The station was placed in operation early this year, and the time has been too short on which to base performance data. Its operation, however, has been thoroughly satisfactory and capable of meeting the estimated requirements.

The new substation is located at the westerly end of the earth fill portion of the pier, approximately 2 miles from the shore of the mainland. The building is practically surrounded by salt water, with its floor line 7.7

ft. above high-tide water level. Great care was necessary in the construction and installation to combat and overcome the effect of salt water and salt air. Proper consideration was given for earthquake hazard in the construction and support of the building. The structure, as shown in one of the illustrations, is of reinforced concrete, built on concrete piles, which were driven practically to the point of refusal into the underlying hardpan.

The ventilation is supplied through three series of louvers, one just above the floor level, one just below the coping, and one in the monitor roof. These furnish an abundance of fresh air with good circulation. Provision is made for future addition of forced ventilation as found necessary to delay the action of the temperature overload control.

The equipment, furnished by the General Electric



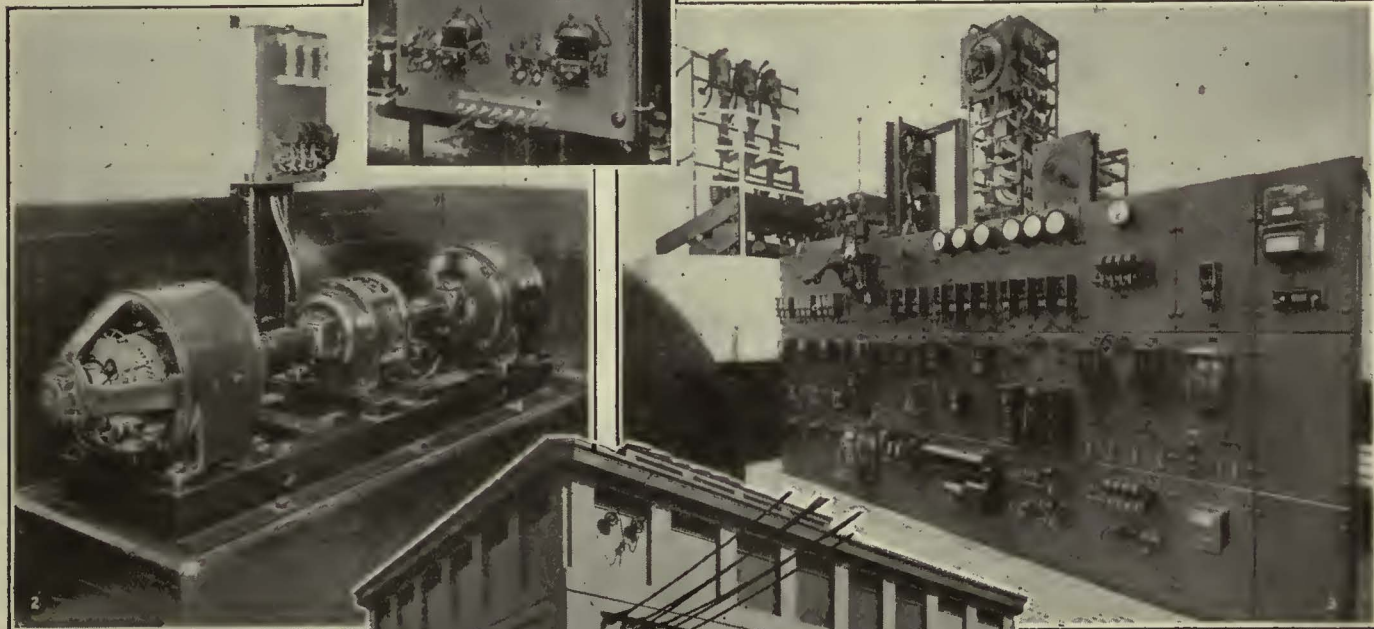
The 1,500-Kw. Synchronous Motor-Generator Set Installed in the New Substation of the Key System Transit Company In the immediate foreground can be seen the two type J.R. high-speed circuit breakers that when closed short circuit a current-limiting resistance. Upon overload, these breakers will open in 0.015 second.

Company and installed by the Key System Transit Company's forces, consists of a 1,500-kw., 11,000-volt a.c. 600-volt d.c. synchronous motor-generator set and the necessary auxiliary and control apparatus to make its operation completely automatic after the starting impulse is given. Control power is obtained from either of two incoming 11,000-volt, three-phase, 60-cycle lines and the equipment is arranged to operate selectively on either of these lines.

The non-overloadable feature of the station is accomplished by the use of temperature relays. Constant voltage is maintained up to 300 per cent of normal load provided the temperature of the generator has not

The equipment is arranged so that it may be started either by remote control or automatically. Either of the incoming lines may be used in emergency. The equipment is designed to take power normally from the preferred line, and the closing of these disconnecting switches energizes the control power transformer and the line side of the line breakers. If the preferred line should fail when the station is not running two relays open and a third relay is energized so that the station may start from the emergency high-tension lines.

On the other hand, if the preferred line fails while the set is running, the station shuts down and starts up automatically on the emergency line. If while running on the emergency line the power returns to the preferred line, no change takes place until the station



Control and Main Switchboard Equipment Provides Many Automatic Devices for Substation Operation

No. 1. The temperature control panel on which are mounted the devices that prevent the motor-generator set from overheating.

No. 2. The motor-generator set that boosts or bucks the excitation field of the main generator, thus regulating the voltage.

No. 3. The main switchboard showing many of the automatic control devices for the automatic operation of the new 1,500-kw.

station of the Key System Transit Company.

No. 4. The substation building is constructed of concrete, non-reinforced. This building is well out in the middle of San Francisco Bay, being at the end of the earth fill of the Key System pier. The main machine floor is 7.7 ft. above high tide. Particular thought is given to salt water and salt air conditions and to the earthquake hazards. Concrete poles are used.

exceeded a predetermined safe value. The maximum current limit of the generator, if the generator becomes heated to the 300 per cent load adjustment, is automatically dropped back, permitting 150 per cent load current until the temperature of the generator reaches a second predetermined value. If the current remains at the 150 per cent value until the temperature of the generator reaches a third predetermined point, the maximum current is again automatically dropped back to the 100 per cent normal load current until cooling of the generator automatically makes possible the restoration of the higher limit points. If, however, the generator continues to rise in temperature at normal load, the set will shut down and be locked out. This condition will not obtain unless some abnormal condition prevails.

shuts down normally, then the automatic transfer takes place back to the preferred line. The condition of the station is shown by means of two signal lights in the office of the superintendent at the Pier Terminal, located a distance of approximately 1 mile from the station. A green light indicates the normal operation of the station, whether running or shut down. A red light indicates a lockout or that the station requires manual operation before it can be started.

The coil of the overload relay is connected to the secondary of a current

transformer, the primary being in the d.c. circuit. A potential is thus induced in the secondary only upon a very rapid rise of direct current, thus differentiating between a short circuit and a rapid increase in normal load. If the d.c. breakers are tripped out due to an ab-

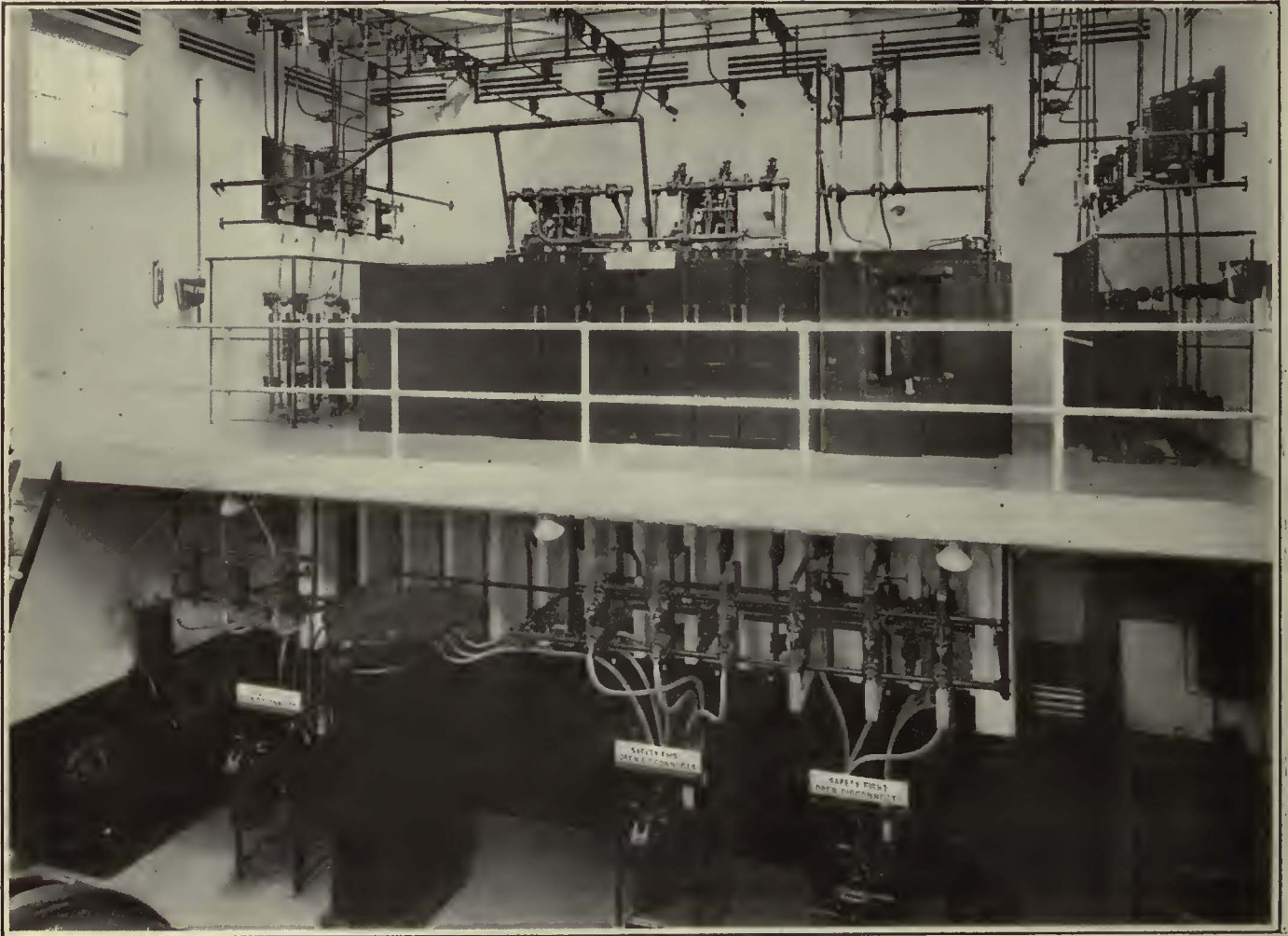
normal load condition or short circuit, the breakers will automatically close after a time delay of 30 seconds, provided the abnormal conditions have disappeared.

The set is shut down by operation of the time switch, or if the set were started from the remote control station, it must be shut down from that station.

A special feature in this installation is the voltage regulating equipment, consisting of a small motor-generator set, which either boosts or opposes the field of the d.c. generators, depending on the excitation of the small generator attached to the control set.

under-voltage connection to the d.c. bus, sudden increase in feeder current, reclosing feeders on short circuits or severe overload conditions.

The building is of poured but non-reinforced concrete. Only the slabs used for the horizontal compartment were precast. Transite inserts are used as barriers between the line and the load insulators of the oil circuit breakers. Construction of the switch cells with rigid structures at the end permits the oil circuit breakers being installed in compartments open on both sides, thus improving the conditions for maintenance.



Showing One Side of the New Key System Automatic Substation

In the lower left-hand corner is seen the motor-generator set used for regulating the voltage of the main d.c. generators. Near

this is the starting compensator, and on either side of the compensator are the three automatic a.c. switches used in starting. On

the gallery is the high-tension room, showing the H-type switch compartments and the bus structure.

Two type J.R. high-speed circuit breakers are connected in parallel in the negative side of the generator. Under short circuit conditions, the circuit breakers open in 0.015 second. These circuit breakers bridge a heavy resistance, which reduces the current to the commutating capacity of the generator.

The equipment is designed to afford automatic protection against sixteen abnormal or normal conditions that will prevent the proper operation of the set. These sixteen features are overspeed, low voltage on the a.c. lines, overload on the a.c. lines, motor field failure, wrong polarity, overheated bearings, single and reverse phase starting, overheated a.c. machine winding, underload or reverse power on the d.c. side, over-voltage on the d.c. side, d.c. ground or flashovers, d.c. under-voltage, single unbalanced or reverse phase operation,

The station was designed and installed by the railroad company under the general direction of the chief engineer. F. M. Morgan, construction engineer for the company, had complete charge in the field of the building construction and the installation of equipment.

Divided Seats for Lake Shore Line

CHANGES in the seating arrangement of cars of the Lake Shore Electric Railway will be made in the near future with a view to increasing passenger comfort. The present type of single seat which accommodates two persons will be replaced by a double seat with two individual spaces. One of the type now under consideration is made of green plush material, 38 in. long, with a small arm in the center to divide the space.



Side View of Altered Car of C. L. R.

Extensive Modernization Program for London Underground

Central London Railway Is Making Sweeping Alterations in Many of Its Wooden Trail Cars—Increased Operating Efficiency Is Hoped For—City and Hampstead Lines Have Adopted a New Standard for Tube Cars—Many New Cars Purchased

FOR several years the London Underground electric railway companies have been carrying out systematic improvements in the types of cars used on their lines. New cars purchased have been designed in accordance with up-to-date developments in car-building practice and much of the existing rolling stock has been modernized from time to time. With one notable exception all of the new cars which have been purchased in recent years have been necessitated not by the scrapping of old ones, but by railway extensions. The exception was in the case of the City & South London Railway.

When the small tubes of that company were enlarged to correspond to the standard tube diameter more than a year ago it was found necessary to retire all the then existing rolling stock, consisting of small wooden cars hauled by electric locomotives, these being replaced by

the regulation steel Underground cars operated on the multiple-unit system. A junction was constructed with the Charing Cross, Euston & Hampstead Railway near Euston and a service of through trains over the two lines started.

MODERNIZATION PROGRAM LIMITED TO CENTRAL LONDON RAILWAY AT PRESENT

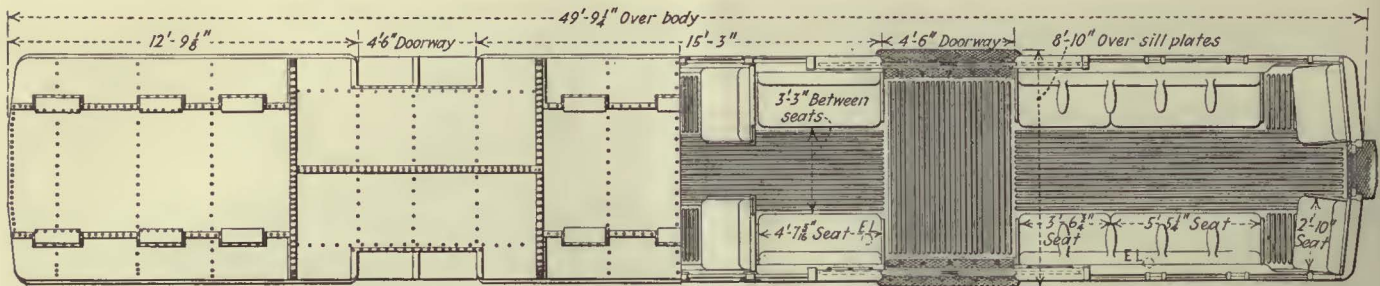
The present modernization of old cars of the underground lines extends only to the Central London Railway. A brief sketch of the work that is being done by this company appeared in the issue of the *ELECTRIC RAILWAY JOURNAL* for June 19, page 1050. With the exception of 24 steel motor cars, one of which is shown in an accompanying illustration, this rolling stock consists of wooden cars built mainly of teak, with metal outside sheeting, and has been in



Draft Screen at Side Entrances



Interior of C. L. R. Cars After Alterations



Floor Plan of Altered Car Adopted by Central London Railroad

service since 1900. Through careful maintenance these cars are still in excellent physical condition, especially as they have been operated entirely within the tubes and have thus escaped the rigors of unfavorable climatic conditions.

Prior to modernization the cars had open-end platforms and no side doors. The work being undertaken consists of closing in the end platforms and cutting two 3-ft. 3-in. doorways at points between the trucks on the trail cars and a double doorway 4 ft. 6 in. wide in the middle of the motor cars. These doorways will be provided with sliding doors, air-operated. The control of doors will be pneumatic, two small pipe lines being run throughout the train. So that closing of the doors may be sufficiently accelerated an electric control will be superimposed, but this control will be of a secondary nature and will not be essential to the door operation. All doors will of course be interlocked, giving a lamp signal to the guard when all doors are closed. The guard will in turn transmit a bell signal to the operator of the train. Operation of the door gear will be effected through the use of a vertical-faced rotary valve with a detachable handle. Piping to the pneumatic door system will be of copper as far as possible, to avoid trouble hitherto invariably experienced with new iron pipe due to scale, cuttings, etc.

DRAFT SCREENS ARE PROVIDED

Side doorways will be provided with semi-frameless draft screens of heavy plate glass attached between the side of the body and vertical grab poles running from floor to monitor. These grab poles constitute vertical struts and are made of steel pipe covered with thin



Interior View Before Alterations Had Been Made

black fiber tubing where handling will occur. The design of the draft screens is shown in an accompanying illustration.

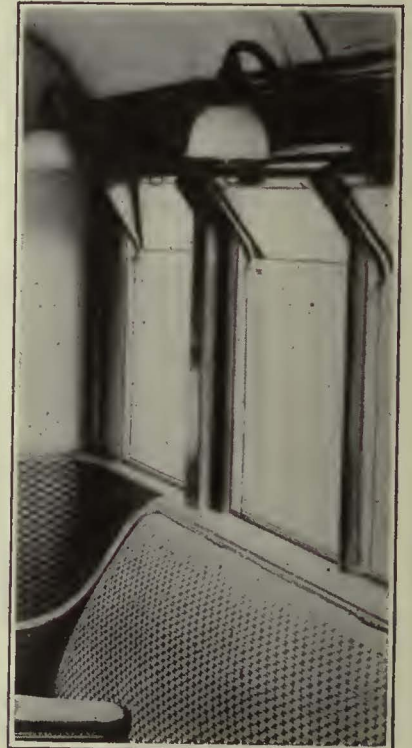
Existing framed windows in the cars are being replaced with semi-frameless main windows with semi-frameless inward-swinging top lights controlled by a dead-centered spring giving open and closed positions.

PECULIARITIES IN DOOR DESIGN

Owing to the small dimension between the cant rail and the floor on the tube cars it is necessary that the side doors should be curved at the top portion to conform to the roof line. This involves not only a discontinuous cant rail, which at the doorways must be replaced by a steel-built lower roof, but also makes it impossible to hang the doors from the top. The standard underground arrangement of a larger bottom roller on ball bearings and a sliding guide at the top has been adopted. In order to maintain the contour of the door these latter are being made of a cast aluminum alloy known as Alpac.

The 24 steel motor cars previously referred to are at present provided with closed ends fitted with hand-operated swing doors and swing side doors located near the forward or motor truck. These latter doors are controlled by means of a door check and are locked and unlocked automatically by the operation of the end doors. Eight wooden motor cars have recently been converted to the same type as the steel motor cars, but it is expected that the doors of the 32 motor cars will soon be converted to the standard pneumatically operated type.

The seats in the modernized cars will be of a well-sprung type, upholstered in moquette, and will replace the old seats of pegamoid, rattan and wood. Additional cross seats will be provided at the newly constructed ends, a slight extension of the floor behind the headstock at the corners being made to accommodate these seats. The interior decoration of the cars will be in



New Top Glass for Ventilation



One of the 24 Steel Motor Cars

green and mahogany, giving a bright and cheerful appearance. Exteriors will be painted red and green.

LIGHTING IS IMPROVED

Improvements are being made in the lighting arrangements of the cars. The present monitor rail lighting is being replaced by bracket lights with Super-flux type shades. These are located along the cant rail, except at the doorways, where similar lamps in ceiling fixtures will be used. Better distribution of light is obtained by making these changes.

The modernized units are being arranged with insulated negative wiring to permit of their being used at a later date, if required, with an insulated return, as is usual on the Underground railways. The negative wire is being temporarily earthed so that the cars can run on the existing earthed return used on the Central London Railway.

Some reconstruction of the trucks may be carried out, experiments in this direction being in progress at the present time. No change is being contemplated just now in the general motive equipment of the Central London Railway, although consideration is being given to the necessity of increasing train lengths and speed. This will eventually require intermediate motor cars and some change in control and other equipment. In all probability the present changes in the cars will make possible considerable improvements in operating schedules, due to the great facility with which loading and unloading may be accomplished.

CITY AND HAMPSTEAD LINES ADOPT A NEW STANDARD

For through service over the lines of the City & South London and the Charing Cross, Euston & Hampstead Railways 197 new cars were recently purchased. These are of an improved type designed to form a



A New City and Hampstead Trail Car

standard for future use. Since their delivery a further order for 127 similar units has been placed and delivery of a large share of these has now been made. They are to be used on the Morden and Kennington extensions, south of the River Thames, of the two railways named above. These lines now have a total of 505 cars, 324 of which are of the new standard.

To arrive at this standard much the same method was employed that was conceived in this country by the Grand Rapids Railway, namely, that of asking various manufacturers to build sample cars embodying all possible improvements in car design. Orders were



Interior of a Standard City and Hampstead Trail Car

placed with five leading British manufacturers of rolling stock for single cars, each to be to Underground specification with respect to dimensions and general principles of design, but to embody any special features that the manufacturers might themselves devise. A sixth car was built to specifications formulated by Underground engineers. These six cars were later submitted to the exacting test of service in the tubes and after an exhaustive trial a new design of car was evolved. This incorporated the salient features of the six test cars and is the standard type of rolling stock now in operation on the City and Hampstead lines.

It has been necessary to reduce the seating capacities somewhat in order to provide additional lateral seats. Passengers have indicated a marked preference to face in the direction of car motion, and this factor, together with the arrangements of the doors, causes the trail cars to have a seating capacity of 48 as compared with the previous capacity of 52. In the motor cars 30 seats are provided and in the control trailers 44, these figures comparing with the former 42 and 52 respectively. The seats, upholstered in a fawn-colored moquette, are of the spring-borne type. Special attention has also been given to the lighting, and the lamps, of shadowless design, are distributed in a manner that permits of a soft yet brilliant light being diffused equably through the car.

The arrangement of the doors governs the general principles upon which the City and Hampstead cars have been designed. Instead of platforms and collapsible gates at each end of the car, there are two pairs of sliding doors, as on the modernized Central

London cars, these being located to divide the interior of the car into three sections. This arrangement makes for expeditious ingress and egress, every seat being conveniently near a door. Each doorway provides an opening of 4 ft. 6 in., the total width of opening to the platforms per car being 9 ft., compared with the 6 ft. afforded by the narrow end doorways formerly used. Operation of the doors is pneumatic, practically similar to the system employed on the modernized cars described above.

A very noticeable feature of the new cars is the smooth and quiet performance in operation. The rattles and other harsh noises frequently concomitant with the operation of trains in tunnels have been largely eliminated. This improvement was effected through experiments and research conducted by Prof. A. M. Low, in which the use of "sound photographs" played an important part. The bogies are inclosed in asbestos shields and special packing devices have been adopted in the bogies themselves and in other parts of the car.

First Aid Teams Popular in Chicago

PUBLIC appreciation of the good work being accomplished by the First Aid Drill Teams of the Chicago Rapid Transit Company is evidenced by the fact that close to 66,000 persons, including hundreds of school children of impressionable age, have attended demonstrations of first aid methods in less than four months. Co-operating with the company's public speakers' organization the teams gave a total of 51 educational talks and demonstrations in the first three weeks of May.

In popularizing the work in the schools of the city, it is believed that not only will the pupils be equipped to render first aid, but they will also help to spread a knowledge of these humanitarian principles among others.

Dr. Hart E. Fisher, chief surgeon of the Rapid Transit Company, is in charge of the various teams.

Track and Line Departments Have Own Maintenance Shop



Work Room Shared by Track and Line Departments in Dallas

TRACK and line departments share a small maintenance shop for their equipment and tools in Dallas. As can be seen in the picture, the shop includes a metal saw, a drill press, grinding wheels, bench tools and equipment for testing meters used in the line department.



All Coupons at the Different Stores Were Distributed and Collected by Young Lady Employees

How Mrs. Shopper Rides*

Cleveland Conducts Survey of Means by Which Shoppers Reach Principal Stores—
Employees of Stores Collect the Data—Electric Railway
Found Principal Agency Used

By *Ralph W. Emerson*

General Manager Cleveland Railway

ONE of the fundamental factors in determining the best method to pursue in handling the problem of traffic congestion in the downtown area in any large community is, first, to determine the relative importance of the different modes of transportation.

A very large percentage of the people entering and leaving the main business section of a city are shoppers in retail stores. Inasmuch as retail stores front for the most part on congested main thoroughfares, a knowledge of just how these patrons reach the stores will enable city authorities and traffic divisions of the police department to determine how congested streets should be used. Such information also will have a commanding influence upon retail merchants in securing their cooperation with the city and its traffic officers. Merchants unfamiliar with the causes and effects of traffic congestion are opposed to the total or even partial restriction of automobile parking. This attitude on their part is largely due to the fact that they see hundreds of automobiles pass their stores and relatively few street cars, and they have gained the impression that automobiles transport the greatest number of their patrons.

Unlimited parking or even the much-abused one hour privilege has brought about a solid line of autos on both sides of our main thoroughfares in the congested district, the occupants of which are not necessarily trading in the store in front of which their auto is parked. Later arriving auto patrons, unless chauffeur

driven, do not have ready access to the store where they wish to trade and must go elsewhere. This defeats the very thing the store owner had hoped to accomplish by his insistence that parking be permitted. If, however, he is a thoughtful man he will take cognizance of what is daily transpiring and awake to the fact that the greatest number of his auto patrons are not benefited by the parking privilege.

PARKING DRIVES SHOPPERS AWAY

Promiscuous parking is the greatest contributory cause to congestion and the slowing up of moving vehicles. Herein lies a very real danger menacing downtown merchants. It is a danger that many of them fail to see, namely, the danger of decentralization, or driving business to the outlying and less congested business centers. It follows that street car riding shoppers will become more and more reluctant to shop downtown if the progress of the street car is impeded to the extent of exhausting the patience of the shopper by taking unreasonable time. It also follows that the shopper who drives her own auto dreads the distasteful trip downtown as congestion increases and opportunity to park her auto becomes less and less.

If that is true, then the future of our downtown merchants in the larger cities is dependent upon the rapidity and convenience with which their patrons can reach their stores. Discovering and believing that to be certain truth, many of the larger stores in the centers of business have provided downtown garages for their

*Abstract of paper at annual meeting of Central Electric Railway Association, S.S. South America, June 28-July 2, 1926.

customers, using either motor coach service to and from their stores or supplying chauffeurs to drive private cars to and from their garage.

Many attempts have been made by those vitally interested in the question of traffic congestion to conduct a poll similar to that under discussion in various cities throughout the country. For the most part these polls have failed, or have not been representative, for the reason that it was found difficult or impossible to enlist the co-operation of local merchants. Apparently some merchants fail to realize the importance of looking at facts or of giving them a degree of consideration adequate to influence their attitude toward parking. They are fearful of agitating the matter because they cannot determine beforehand in their own minds what might be the result of restricted parking. Existing conditions are satisfactory to them and any change in the means of travel of various classes of their patrons is unwelcome. Any traffic poll must depend for its success upon a sufficient number of merchants of diversified interests willing to discover how existing conditions may be changed into new and more orderly and more universally beneficial situations.

CLEVELAND CONDUCTS SUCCESSFUL SHOPPERS' POLL

In the city of Cleveland a poll recently made resulted most successfully because it had the approval and enjoyed the co-operation of the forward-looking merchants' association, known as the Retail Merchants' Board, which is a branch of the Cleveland Chamber of Commerce. At the request of the Cleveland Railway, the secretary of the Retail Merchants' Board called a meeting of all members. The purpose of the poll was presented to them, together with a statement that the railway company would bear the entire expense of such a survey, whereupon the board appointed a committee to co-operate with the railway company in the working out of plans and details of the survey. It was decided that the poll would be carried on in 22 stores. These stores were not only the largest in Cleveland, but represented the greatest diversity in goods which they sold. It was further decided to carry on the poll on three days of the week, namely, Tuesday, Thursday and Friday, for the reason that these days are probably the three heaviest days of the week at this time of the year. The dates decided upon were June 1, 3 and 4.

After a consideration of the various ways in which this information might be gathered, it was decided to distribute to the store patrons a ballot with a perforated tear-off corner, as being simple and not apt to cause congestion at store entrances.

The four perforated corners of the ballot, as shown, bear the following language:

1. I came downtown in a motor coach.
2. I came downtown in a street car.
3. I came downtown in a private automobile.
4. I walked downtown.

The work of the survey was conducted by 80 young ladies employed by the various stores affected by the survey. On the Saturday preceding the survey a meeting was held in the Chamber of Commerce library, when these young ladies were given instructions fully informing them as to the purpose of the survey, details of carrying it on and the work which they were to do. In passing, it is only fair to say that the large vote which was secured was due in no small measure to the high caliber of the clerks assigned to this work and the

painstaking effort which they put forth to get out as large a vote as possible. These girls were identified by silk streamers bearing the words "Traffic Survey."

Prior to the first day of the poll, ballots and boxes for the reception of coupons bearing the words "Please Deposit Traffic Survey Ballots Here" were distributed to the 22 stores. With the opening of the stores on Tuesday morning these ballots were handed to the shoppers as they entered the store with the courteous request that the patron read the ballot while in the store. As the patrons left other young ladies requested them to deposit their ballots in the ballot box, which was conveniently and conspicuously located at the exit door.

The ballot used by the patrons for the three days was pink in color. A green ballot was supplied to the



Records Were Taken by a Simple Form of Ticket with Four Coupons

employees in the stores affected, and they voted on the first day only. On Friday, the third day of the survey, Woolworth's largest 5 and 10-cent store was added, making 23 stores for that day. A poll was also taken in the Hanna Building, as being a typical downtown office building.

The survey was preceded by considerable newspaper publicity, stating the purpose and explaining the ballot, so that those voting were more or less prepared for it. The distribution of the survey is shown in Table I.

TABLE I—TOTALS OF GREEN AND PINK BALLOTS AT DIFFERENT CLEVELAND STORES

Firm Name	Buses	Per Cent	Cars	Per Cent	Autos	Per Cent	Walked	Per Cent	Total
Ames.....	434	11.9	2,500	69.0	538	14.8	154	4.2	3,626
Bailey.....	545	6.5	6,401	76.2	1,118	13.3	343	4.1	8,407
B. R. Baker.....	103	8.0	519	40.4	595	46.1	74	5.7	1,291
Webb C. Ball.....	34	7.7	194	44.0	187	42.4	26	5.9	441
Bedell.....	945	31.9	1,418	47.9	489	16.5	115	3.8	2,967
Bowler & Burdick	11	6.9	60	37.5	83	51.8	6	3.7	160
Geo. H. Bowman	224	6.8	2,578	74.4	561	16.1	104	3.0	3,467
Browning, King..	76	12.6	267	44.2	193	32.0	68	11.2	604
Burrows Bros.....	130	7.7	950	56.7	471	28.5	122	7.3	1,673
Chandler & Rudd	180	8.3	1,570	72.4	333	15.3	89	4.1	2,172
W. B. Davis.....	184	8.8	497	52.1	342	35.9	31	3.2	954
Halle Bros.....	771	9.7	4,269	53.5	2,657	33.3	288	3.6	7,985
Higbee Co.....	2,016	13.6	9,065	61.5	3,301	22.4	350	2.4	14,732
Kinney & Levan..	311	16.4	898	47.4	605	31.9	81	4.3	1,895
Lindner.....	389	15.0	1,238	48.0	818	31.7	135	5.2	2,580
May Co.....	1,256	7.0	13,151	73.8	2,812	15.7	633	3.5	17,852
Oppenheim-Collins	160	10.8	905	61.4	334	22.6	74	5.0	1,473
Siegels.....	61	11.2	322	59.5	137	25.2	22	4.1	542
.....	165	9.2	1,113	62.1	429	23.9	85	4.7	1,792
Sterling & Welsh.	146	8.3	786	44.8	732	41.7	91	5.2	1,755
Stone Shoe.....	133	9.5	911	65.2	296	21.2	57	4.1	1,397
Wm. Taylor Son..	914	8.6	7,301	68.4	2,090	19.6	359	3.4	10,664
F. W. Woolworth	165	7.1	1,701	73.0	320	13.7	144	6.1	2,330
Hanna Bldg.....	220	8.5	1,332	51.3	872	33.6	172	6.6	2,596
Totals.....	9,473		59,946		20,313		3,623		93,355
Per cent.....		10.1		64.2		21.8		3.9	

The figures given in Table II indicate that of the combined shoppers and employees voting only about one in five uses a private automobile.

STORES SHOW DIFFERENT PERCENTAGES

As might be expected, the percentage using the various modes of transportation varied considerably in the different stores.

The highest percentage using motor coaches was at the Bedell Company, a high-grade women's apparel shop, where 33.16 per cent of the 2,826 voting used the motor coach. The lowest were patrons of the Geo. H. Bowman Company, a china and glassware store, where 6.48 per cent used motor coaches of the 3,395 voting.

In this connection it might be well to state that the railway company operates but one motor coach line through the territory affected by the 23 stores.

The largest percentage using street cars was at the Bailey Company, a large department store, where 75.48 per cent used the street cars of the 7,757 voting. This

TABLE II—SUMMARY OF FIGURES GIVEN IN TABLE I

Shoppers voting.....	85,657	Employees voting.....	7,698
	Motor Coach	Street Car	Auto-mobile
Shoppers, number.....	8,910	53,738	19,551
Shoppers, per cent.....	10.46	62.74	22.82
Employees, number.....	563	6,208	762
Employees, per cent.....	7.31	80.64	9.9
Total, number.....	9,473	59,946	20,313
Total, per cent.....	10.15	64.21	21.76
			Walk 3,458 4.04 165 2.15 3,623 3.88

is without doubt low, for the reason that many of the patrons in this instance were foreigners who did not understand and could not be made to understand what the ballot was for. Without doubt most of them were car riders. This is further borne out by the fact that in the same store more than 90 per cent of the employees used the railway facilities.

The smallest percentage using the street car was at the Sterling & Welch Company, a very high-grade house-furnishing store, where 36.74 per cent of the 1,410 voting used that mode of transportation. The largest number of patrons using private automobiles was also at the Sterling & Welch Company, where 48.29 per cent came in this way.

An interesting feature of the survey is the fact that more than 4 per cent of the patrons in the downtown stores walked to the store, the largest percentage being 12.01 per cent, at Browning, King & Company, and the smallest being 2.48 per cent, at the Higbee Company.

No confusion and practically no delay were found at store entrances, where the ballots were distributed, and in evidence of the satisfaction of merchants it may be noted that not a single one offered a word of adverse criticism, while many of them voluntarily presented letters of commendation.

The results obtained are as accurate as can reasonably be expected and they showed conclusively that the facilities of the local transportation company carry the bulk of shoppers.

SURVEY SUGGESTS POSSIBILITIES OF IMPROVEMENT

Immediately upon publication in the local papers of the figures herein given agitation of radical parking changes was enlivened. Councilmen, the secretary of the Cleveland Automobile Club and the Traffic Commissioner of the Police Department were convinced that a revision with new restrictive clauses of local parking regulations was demanded. The sentiment prevailed

that not only is it necessary to eliminate the one hour parking provision on main thoroughfares of the business center of the city, but also the unlimited parking on side and back streets. On these latter streets it is believed an opportunity might be given for shoppers and others to park for brief periods of time.

It is hoped that, with the figures of this poll at hand, disputes and misunderstandings as to the relative importance of the different modes of transportation may be answered and that the survey may act as a starting point to bring about a more equitable use of our main thoroughfares.

Municipal Railway Talk Over Radio

Superintendent Henderson at Seattle Explains Some Phases of Local Operation Little Appreciated by General Public—Citizens Owe It to Themselves and the City to Use Lines Whenever Possible

D. W. HENDERSON, general superintendent of the street railway division of the Department of Public Utilities of the city of Seattle, Wash., has been talking over the radio to the people of Seattle about the municipal railway. He admonishes the public to remember that the street railway is not owned or controlled by a few capitalists. Neither is it owned nor operated by a clique of politicians, but it is owned by the entire public of the city of Seattle. Mr. Henderson said that in order to make it a success and that the very best service possible might be given it is the duty of residents as citizens to patronize the cars and to boost it wherever they can, "as the street railway system of the city of Seattle is at this time one of its best assets."

Mr. Henderson said in part:

"On April 1, 1919, the city of Seattle took over the operation of the street railway system of the Puget Sound Traction, Light & Power Company, consisting of about 220 miles of track, 507 street cars (including freight equipment) the carhouses and shops necessary for the operation of the road and the employees necessary for operating the lines. The city gave in payment for the property \$15,000,000 in utility bonds bearing 5 per cent interest. When the city started operating it had no capital to work upon except the revenue collected from the passengers. Previous to the purchase of the road, those in charge at the City Hall held they could operate the lines on a 5-cent fare, pay all operating expenses, meet the principal on the \$15,000,000 of bonds and interest thereon and, in addition, give the employees an increased rate of wage over and above that which was being paid by the traction company.

"The first payment on the principal of the bond issue was not to be made until March 1, 1922, but it was necessary to pay the interest every six months. On April 1, 1919, there were 1,876 employees in the service of the railway; on April 1, 1920, there were 2,208; on Dec. 1, 1925, there were only 1,891. Instead of having an amount of money sufficient to pay the interest on the bonds and to meet the operating cost at the end of the first year's operation, there was a deficit of more than \$1,000,000.

"There has been paid to the bondholders the sum of \$5,256,325 in interest and by March 1, 1926, there will have been paid \$4,225,000 of the principal. Up to date

we have been able to meet all of our bills and obligations, partly due to the fact that the banks of the city were willing to carry our warrants from time to time so as to enable us to meet expenses. Whether it be private or public, there is no large organization such as this which does not at times have to borrow in order properly to handle its business.

"It was plain after the road had been operated for a year that the 5-cent fare would not insure revenue sufficient to meet the obligations which were required and it was found necessary to increase the fare. The first increase in fare was in July, 1920, when the rate was raised to four tokens for 25 cents or 10 cents cash. We operated under this rate until Jan. 9, 1921, when the fare was again increased to three tokens for 25 cents or 10 cents cash. On March 1, 1923, in order to satisfy some citizens who were still under the belief that the system could be operated on a 5-cent fare, the fare was again reduced to 5 cents with a charge of 1 cent for transfer. The opinion was that by reducing the fare enough extra riders would patronize the cars to increase the revenue to meet the obligations. In order to do this, it was necessary to increase the riding 45 per cent. But, from the experiment, we found there was an increase of only 7 per cent, and on June 16, 1923, after 3½ months trial of 5-cent fare, the previous rate of three tokens for 25 cents or 10 cents cash was restored. This experiment caused a deficit of \$500,000, and we have been trying our best to overcome this deficit since that time. Under this last rate of fare, however, we were able to secure revenue sufficient to meet the operating costs, the interest on the bonds and the payment of the maturing principal. One thing you must remember—that few large organizations ever attempt to redeem bonds as the Seattle Municipal Street Railway is doing with its bond issue. It is necessary for us to redeem each year the sum of \$843,000 of bonds and in addition pay interest every six months. You must also bear in mind that the Supreme Court of the State of Washington ruled, in what is known as the '14 Taxpayers' Suit,' that no general fund money of any kind can be used for the maintenance or operation of the street railway system of the city. Many people are under the impression that they are paying taxes in addition to the car fare. No taxes have yet been

paid by the public for the maintenance or operation of the railway.

"Lately there has been considerable agitation regarding the installation of a rapid transit system as part of the street railway. Subways in other cities have cost in the past more than \$11,000,000 a mile. Before any steps are taken to build any rapid transit system in the city of Seattle, the matter should be very thoroughly investigated by competent engineers. Unless you have traffic sufficient to load the rapid transit cars practically at all times, there is no chance of any reduction in fare.

"There has been considerable talk about the street railway system becoming obsolete and that buses would take the place of street cars. Experts have come to the conclusion that in any city with more than 100,000 population the street car is necessary to handle mass transportation. There is no question but that buses can be used to good advantage in most any city to feed the street car lines. We are operating buses in the outlying districts in conjunction with the railway and, since they have been in operation, the buses have built up the districts in which they operate. By working both the street car and the bus, there is no reason why any city should not have the service to which it is entitled."

Caring for Increased Traffic in Jacksonville

Business Activity of Florida's Largest City Reflected
in Street Railway Traffic—Spray Painting
Used Extensively for Cars

CHIEF among the transportation problems in Jacksonville, Fla., during the past year has been to know how to take care of the increased traffic. The reason is that Jacksonville has not only participated in the real estate development of the other cities in Florida, but it has also been the gateway to all of the state for automobile and railway traffic except for the far western section of the state near Pensacola.

Up to last September the company had been in the hands of a receiver since 1919. Then the receivership was lifted and J. P. Ingle, who had been receiver since April, 1925, and previously had been general manager



Island Platforms with End Lights, Installed by City, Speed Boarding and Alighting



Double-Truck Car Converted to One-Man Operation



Main Carhouse in Jacksonville

under the receiver, was appointed general manager of the property. During the receivership the city of South Jacksonville constructed an extension to the Jacksonville system as a municipal enterprise and had purchased sufficient cars to operate it. This track and these cars were then leased by South Jacksonville to the Jacksonville Traction Company.

The rolling stock of the Jacksonville Traction Company consists of 107 cars, of which 57 are single-truck Birney cars. The company has also rebuilt 22 of its double-truck cars for one-man operation, adding complete safety equipment.

CAR EXTERIORS ARE SPRAY PAINTED IN A SINGLE COLOR

Yellow has been adopted as the standard color for the entire car except the roof, and very little striping is used. This solid coloring was not adopted because it was considered more attractive than a combination of colors for the car body, but to shorten the time that cars being repainted have to be in the paint shop. Spray painting is used for both car body and roof. While the body is being sprayed the windows are covered with bar soap which is rubbed on from a cake. After the spraying is finished this soap, with any paint which has lodged on it, can be taken off in a few minutes with a putty knife. The only brush work used on the car, except for the striping, is on the lower part of the roof to make an even edge where the roof and body spraying meet. About 30 minutes is required for each coat of paint, and the company gives each car two coats at a car-painting period.

To distinguish the old rear-entrance cars from the new front-entrance cars, the Brooklyn design of an irregular star on the front dash was first tried. This has been abandoned for the words "Rear Entrance" in black and a curved arrow pointing to the rear. Both lettering and design appear on the side of the dash nearest the curb.

As on several other properties under the management of Stone & Webster, considerable use is being made of Miller sliding shoes instead of trolley wheels. No change was required in the overhead construction nor is any grease used on the trolley wire.

The fares charged are 10 cents for a single ride and five tokens for 35 cents. In addition, a weekly pass is sold for \$1.25.

A Ten-Year-Old Pretzel

ALITTLE more than ten years ago the first issue of the *Pretzel*, published by the Reading Transit Company, Reading, Pa., was placed in the little boxes in the street cars. Since that time the publication has never missed a single issue, appearing every Friday morning. The *Pretzel* has always endeavored to be a pleasant traveling companion. Almost every issue contains an item or two giving patrons a "close-up" of the work of the departments connected with the operation of the railway.

In its weekly chats the paper has acquainted car riders with some of the railway's problems, related a number of accomplishments, thanked riders for patronage and compliments, accepted and quite frequently profited by criticisms. The *Pretzel* has enjoyed a steady increase in circulation. The first week that it was placed in the cars about 20,000 were taken from the boxes. More than 32,000 copies are now printed every week. In addition to the thousands which are read in the cars, many are preserved and mailed to the friends and relatives of patrons in other cities. The *Pretzel* has a regular mailing list of approximately 200 names. The little four-page paper is sent to practically every state in the Union. The *Pretzel* starts its second decade with a determination to cling to its purpose as announced in its first issue—that of being a friendly, chatty traveling companion for street car riders.

Illuminated Train Number Boxes in Dallas



Convenient Train Number Device Used by the Texas Electric Railway

ILLUMINATED train number boxes, similar to those shown in the illustration, are used on the cars of the Texas Electric Railway, Dallas, Tex. Four sets of numbers are mounted on cloth rolls and can be turned by the handles projecting from the sides. The numbers can be seen plainly by day and are illuminated by lamps at night.

This device has facilitated identification of cars by the supervisory force.

The Readers' Forum

The Grand Rapids Bonfire Was a Serious Mistake

INDEPENDENCE, July 4, 1926.

To the Editor:

I see by your issue of July 3 where Grand Rapids had a bonfire and burnt up what they called antiquated equipment. They made a very serious mistake in doing this. These cars might have been "antiquated" in Grand Rapids, but they would have been, according to the illustrations, very modern in my town and they should have given them to the traction company.

By the pictures some of the burnt cars had as many as eight wheels onto them and all the wheels on each side of the car showed as being on. In my town some of the cars that have three wheels are able to negotiate the hills when properly loaded.

Out of more than 130 cars that my town has got there are at least 57 varieties, and it has been suggested that each one of the 57 varieties be segregated and used to advertise one brand of Heinz's pickles into it as the oldest variety just corresponds in age with the time Mr. Heinz put out his first pickle.

Sometimes these cars in my town stop for no apparent reason when going up a hill, but never whilst descending. The other day the writer was onto one of these which stopped ascending a hill, and after all other ordinary expletives had failed the motorman says to the car "gid-dap" and off it started. He told me his grandfather drove that car in 1851 when it had mules onto it, which probably accounted for its peculiar proclivities.

A. NUISANCE.

Read "Electric Railway Practices in 1925"

BOSTON ELEVATED RAILWAY

Offices of the Public Trustees, Park Square Building,
31 St. James Avenue

BOSTON, MASS., July 1, 1926.

To the Editor:

I have noted with interest your review of "Electric Railway Practices in 1925" in a recent issue of the ELECTRIC RAILWAY JOURNAL, with particular reference to the similarity in names between this book and "The Handbook of Modern Electric Railway Methods and Practices, 1925." While greater differentiation in title might be desirable, the plan and scope of the two books are so different that there should be no confusion in the minds of electric railway executives if they will study them both carefully.

Now that "Electric Railway Practices in 1925" has been distributed widely, I would like to emphasize the importance of a careful reading of the book by all responsible railway men. The presentations this year were remarkable in comprehensiveness and in the quality of the practices which were described. If the reading of the book gives to a manager a single new idea it will be worth the few hours of his time that is necessary.

It seems to me that a manager might well expect of his department heads that they also familiarize them-

selves with the contents of the book. The Charles A. Coffin Foundation is expending a substantial sum to put this digest into the hands of every man who can use it efficiently. By prompt co-operation of the technical press the best practices disclosed in the presentations were made available to the industry some months ago. This volume, as you state, "with the information carefully collated and grouped under subject heads, gives another use for it (i.e., the material in last year's briefs)."

I hope that the similarity in names between the two books referred to will impel a close examination of both by the industry to determine wherein they are alike and wherein they differ.

HENRY H. NORRIS,

Editor "Electric Railway Practices in 1925."

Greater Care Is Needed at Steam Railroad Crossings

CLEVELAND, OHIO, June 28, 1926.

To the Editor:

It is common knowledge that most street railway companies at one time or another have suffered loss because of carelessness or neglect on the part of crossing flagmen. My experience, by observation over a period of several years, is that 95 out of 100 street car conductors in flagging a car across railroad tracks fail to look both up and down the tracks before so doing, and a good proportion of them walk straight across the tracks without ever giving a thought apparently to the need of looking to their right or left. This lack of attention on the part of certain employees is often the cause of the company paying out large sums of money for damages.

At a certain railroad crossing protected by gates operated by a railroad watchman the traction company also had a man on the job. In one instance a street car pulled up to the crossing and stopped. The gates were up at this time and the traction company flagman was in a sitting position, apparently in a trance. The railroad gateman came out of his shanty and tapped this fellow on the shoulder, at the same time pointing up the track toward an approaching passenger train. Thereupon the fellow rose from his seat and by motion of his flag in hand indicated to the car motorman that he was to wait.

Toward the close of the World War three railroads entering Akron, Ohio, were drawn into a controversy with the city because they had closed up and fenced a dangerous railroad crossing, after first having built a substantial and satisfactory overhead bridge. The small merchants and workmen of that end of town protested that the crossing should be reopened. After proposals and counterproposals had been exchanged between city and railroads, an agreement was reached whereby the crossing was reopened, and one railroad installed gates and furnished watchmen and gatemen. It was further agreed that this company would have complete supervision of the crossing, including the employees. The city's contribution was in the form of a check mailed to the railroad company once a month, the amount being equal to one-half the pay of crossing attendants.

This suggests one possible way in which better protection may be secured at steam and electric railway crossings.

W. H. CAMERON.

Maintenance Notes

Trolley Tap Does Not Interfere with Car Operation

COMPRESSED air for pneumatic track tools is obtained by the United Railways & Electric Company, Baltimore, Md., from an electrically operated compressor placed at the side of the street. Power for operating the compressor comes from the trolley wire by a specially designed copper hook being placed over one of the trolley ears, as shown in an accompanying illustration. Current is carried from the hook to the compressor through an insulated wire attached to a light bamboo pole. With the hook in position over the trolley ear the rod is tied back to one of the span wire supporting poles in such a way as to be out of the way of passing cars, and the hook over the trolley ear permits passage of trolley wheels, so that car operation is not interfered with. This makes it unnecessary to remove the hook from the wire until the position of the compressor is changed.

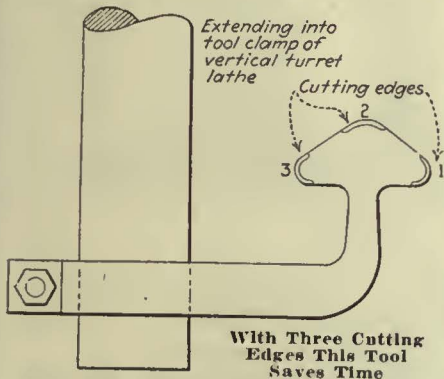


Trolley Tap Prevents Interference with Car Movements in Baltimore

castings come to this lathe finished operator at random and placed in the on the faces forming the split. Two of vertical chuck. The first operation is these sections are picked up by the to machine the outer side of the

Machining Performed in One Operation

IN THE shops of the United Railways of St. Louis has been installed a new Bullard vertical turret lathe that is used almost exclusively in the machining of the split bronze axle bearings made by the railway.



Special tool constructed in the shops of the United Railways of St. Louis, with three cutting edges for facing the inside, bottom and outer side of split bearings.

The machine is a remarkable time-saver, requiring only from five to ten minutes per pair to turn out the bronze axle bearings. The bearing



Bullard Vertical Turret Lathe for Machining Split Bearings

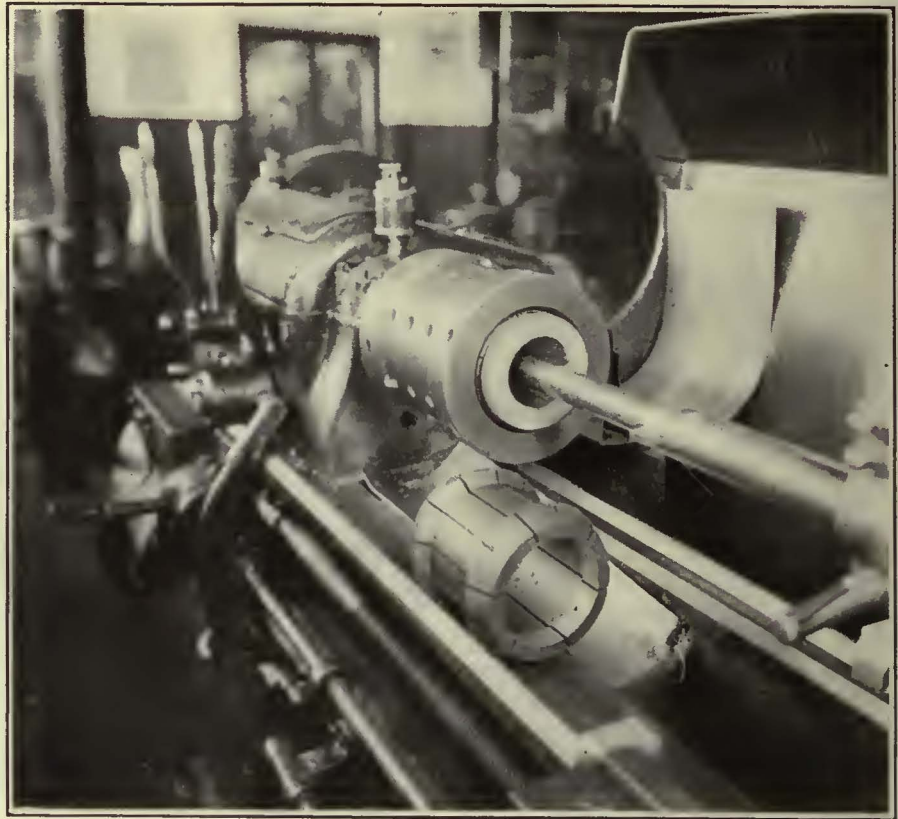
bearing collars and a second tool, mounted on the turret, machines the face of the collar. The third tool has three cutting engines, the general design of which is shown in the accompanying sketch.

In machining, the tool is first run down the inside of the split halves of the bearing, accurately machining the bearing surfaces on the inside, using cutting edge No. 1. The tool is then moved sideways, cutting on edge No. 2, as shown in the diagram, which machines the bottom of the bearing as it stands in the chuck. The tool is then raised and cutting edge No. 3 machines the outer surface of the lower end of the bearing, thus completing the machining operation.

Whipping Weeds Off the Right-of-Way

FOR several years the Texas Electric Railway, Dallas, Tex., has used a home-constructed device to destroy the weed growth on the roadway by mechanically tearing the weeds to pieces. The Texas Electric maintenance crew goes over the right-of-way once or twice a year with this equipment, at a cost that averages 90 cents per mile per cutting. If the whipping process is done before the seeds develop too far, they can be destroyed effectively in this manner.

As shown by the illustration, the equipment is both electrically and gas driven. The gasoline engine, taken from a used automobile, propels the equipment along the track at a speed of from 6 to 10 m.p.h. The weed-whipping device is driven by means of a motor operated from the trolley. This weed-whipping de-



A Special Type of Chuck Facilitates the Boring of Armature Bearings in the Shop of the Department of Street Railways in Detroit

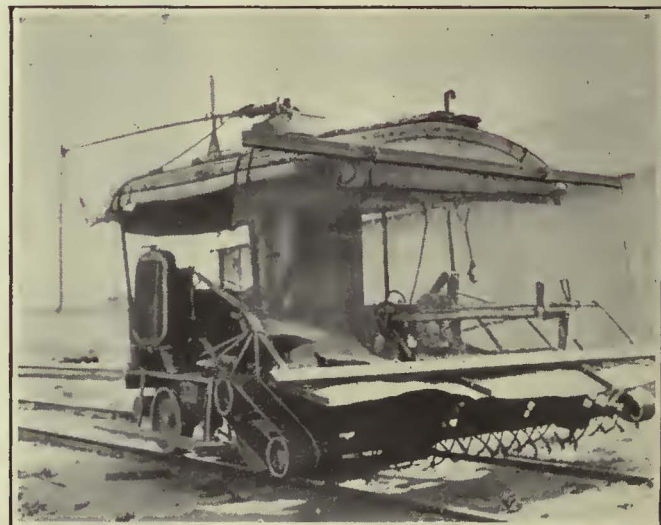
vice consists of a rod drilled at numerous points through which small sections of about $\frac{1}{8}$ -in. diameter steel cable are inserted. The cable is then cut off to the predetermined length and wedged in place by means of small metal nippers so that the wires will not throw themselves out when revolved. Since these wires wear out, the fastening device or wedge must be one that can easily be loosened so that new wires can be put in. To protect the equipment and the operators who ride in the car, a large metal fly screen is supported in the front.

Special Chucks Assist Armature Bearing Work

PROVISION is made for boring armature bearings so that the bore will be centered accurately in relation to the outside finished surface by the Department of Street Railways, Detroit, Mich., which uses a special chuck. The bearings are bored in a lathe by means of a horizontal boring bar. The chuck in which the bearings are held during the boring operation consists of three parts. The main outside section is fastened to the tailstock of



Weed Whipper Used by Texas Electric Railway



Weed Whipper Used by Texas Electric Railway

At right, front view of electric weed whipper, showing the gasoline engine unit which drives the vehicle. An electric motor revolves the weed whipper and cuts the tops off the weeds.

the lathe. A center portion holds the bearings and an end ring is used as the clamping medium.

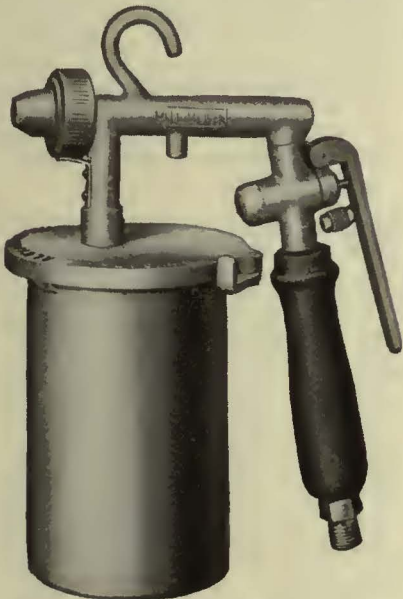
In the accompanying illustration one of the central portions in which the bearings are placed is shown lying on the bed of the lathe. It will be seen that this has two flanged ends which are beveled. This collar is split lengthwise by a number of saw cuts. The saw cuts do not run the entire length, however, and those which extend from one end are alternated with those which start at the other. When the slotted collar is placed inside the chucks pressure to clamp the bearings is obtained by

the end collar bearing on the beveled section at the front end while the rear end is pressed against a similar beveled section of the main outside casing. By screwing up on the end ring sufficient pressure is obtained so that the bearing is clamped securely and accurately. Slotted collars of various sizes are used to take care of different types of bearings. The outside portion of the slotted collars, however, is made uniform so that they all will fit in the same outside chuck. With the bearing in position the flange end extends outside of the chuck so that this can be finished off accurately by the same boring bar.

New Equipment Available

Light-Weight Paint Spray

SO AS to make the operation of spraying paint as easy and simple as possible, the Alexander Milburn Company, Baltimore, Md., has just brought out a light-weight, compact and extremely efficient paint spray equipment. Particular attention has been given in the design of this to provide simple construction without moving parts and passages



New Self-Contained Type of Paint Spray shaped so that clogging will not result. The equipment consists of a rugged cover, body, atomizer and a convenient handle. The illustration shown is for the company's type A, which weighs approximately 1 lb. with a pint container and 17 oz. with a quart container. The body, cap and container are made of aluminum and the atomizing chamber and tip are

made of forged bronze. The handle is of a special composition fiber.

In operation the paint enters a large annular chamber surrounding the air nozzle, from which it is atomized and expanded in a venturi shape. Atomization is regulated by turning the nozzle. Adjustment provides for a large spray or for entirely shutting off. With the paint shut off the equipment can be used to provide a stream of air for dusting and cleaning purposes. The manufacturers recommend an air pressure of approximately 40 lb.

To test the efficiency of this particular type of spray a large railway system used it for painting cars. Eleven coats of paint were applied and each coat was rubbed down before applying another. It was found that the Milburn spray produced a saving of 75 per cent in time and provided for a reduction in labor of three men.

Large Size Portable Vacuum Cleaner

REPRESENTING a distinct improvement over previous models, a new portable vacuum cleaner, for heavy service such as is needed by electric railways, has been placed on the market by Allen & Billmyre Company, Inc., New York, N. Y. The machine weighs approximately 105 lb. and through use of rubber-tired wheels it can be moved about with exceptional ease. By means of a 15-ft. or 25-ft. length of hose a large surface can be cleaned without constantly moving the machine. It can be used with the same ease as the

ordinary household vacuum cleaner.

The frame of the machine is similar in construction to an automobile chassis except that it stands in a vertical position. It is made in one piece and is mounted on easy running ball bearing wheels which transport the cleaner with very little physical effort. All parts fastened to the frame are welded to assure strength and rigidity and also to avoid vibration.

The exhauster and $\frac{1}{2}$ -hp. Westinghouse motor are made in a compact, self-contained unit of aluminum construction. This electrically driven device is efficient and is entirely free from wearing parts and there is only one working part, i.e., the steel shaft on which the armature and aluminum impellers are mounted. This shaft operates in ball bearings, which lengthens the life of the machine. Its operation is similar to other vacuum cleaners on the market, except that the air is filtered very thoroughly before it is again set free. The air suction produced by the two-stage centrifugal exhauster, with its one-piece aluminum impellers, draws the dust and dirt into a container which holds approximately one peck. The cloth filter is held at a distance of 1 in. from the metal container by means of a mesh screen and the entire design of the unit is unusually simple and foolproof.



Portable Vacuum Cleaner for Heavy Service

This machine can be operated from a lamp socket or floor plug connection. The Westinghouse motor with which the machine is equipped can be operated on direct current of 100 to 120 volts or on alternating current of 105 to 120 volts, 25 to 60 cycles, single phase. Machines can also be supplied for 220 volts.

Association News & Discussions

Central Electric Railway Association Contributes Valuable Ideas

Principles of Taxation, Getting New Business and Reduction of Costs Among Outstanding Addresses Made on the Voyage of the "South American"

HARDLY a more delightful mixture of pleasure and gainful effort has been experienced in any recent railway meeting than on the boat trip of the Central Electric Railway Association. From Monday, June 28, until Friday, July 2, the good ship *South American* carried its 300-odd delegates and guests over the Great Lakes. Two stops were made for golf and sightseeing, and bridge and deck games were continually in progress.

Three business sessions were held aboard ship. Ralph Emerson, general manager Cleveland Railway, presented a paper in which he interpreted the recent "shoppers' check" made in Cleveland into facts of value to the industry at large. As stated in the paper, which is abstracted elsewhere in this issue, only one customer in five rides to shop in his or her own conveyance.

Captain Leslie Vickers, economist of the American Electric Railway Association, told of the advanced thinking concerning railway taxation. He showed the futility and injustice of the ad valorem tax now so common. Captain Vickers believes in the tax on gross and net revenue. He cited authorities of national reputation who also approve this basis. His paper is abstracted in this issue.

DEVELOPING OFF-PEAK BUSINESS IN CINCINNATI

Development of off-peak business was considered in a paper prepared by Walter Draper, president Cincinnati Street Railway, but in Mr. Draper's absence the paper was read by H. R. Biery, director of public relations. Mr. Draper contended that buses must be held down to legal speed and electric cars accelerated to legal speed if conditions are to be improved. In his opinion, if only a little change is effected in this situation the improvement will be noticeable and far reaching. Special fares during different periods of the day have not been found workable in Cincinnati, he said. Off-peak riding has been developed by advertising events that may be seen during the non-rush hours. On one occasion 100,000 people were hauled in the off-peak hours of a single day. Special car business, once an important element of the service, has now disappeared. However, this class of business has fallen to the company's buses.

A prepared discussion was presented by Clinton D. Smith, general manager Beaver Valley Traction Company. Mr.

Smith's experience with the zone fares and with different combinations of weekly passes has been extensive. Destination checks formerly were used, but now since their elimination various investigations have failed to reveal any abuse of the system, whereas many advantages have accrued to the company, such as increased speed of operation and savings due to the elimination of checks. The 5-cent zone appears to be uneconomic and consideration is being given to increasing this base fare, he said. Replies to some 300 letters sent out to merchants in the Beaver Valley indicate their desire to see the Beaver Valley Traction Company on a paying basis, as they believe the cars to be a substantial asset to the industries the company serves.

J. W. Welsh, executive secretary A.E.R.A., pinch hit for D. L. Gaskill, secretary-treasurer for the East Central Division of the N.E.L.A. in reading his paper. Mass consideration of industry problems of public policy and personnel was of greatest importance, he said. The amount of good to be obtained from participation in an association depends upon the spirit brought to it.

REDUCED INSURANCE RATES POSSIBLE

Cause and prevention of electric railway fires was the subject of a paper by J. S. Mahan, president Western Section of the International Association of Electrical Inspectors. One reason that rates are high is that the railways carry the best risks and pass the poorest on to the insurance companies. Mr. Mahan analyzed several disastrous fires on railway properties and showed the elements that had contributed to their starting, the conditions which existed and specific fires on traction properties which had come within his observations, though omitting names.

The first was of a carhouse with no division walls and entrance from one end only and with a light metal roof. The fire probably came from a stroke of lightning and the spread of the fire was so rapid that the employees in the carhouse were unable even to save their own clothes. The roof buckled under the heat, resulting in the loss of about 90 cars. Investigation showed that the protection from lightning was not adequate and that the trolley poles had been placed in contact with the trolley wires, preparatory to the early morning runs out of the carhouse. This probably contributed to the rapid spread of the fire by providing numer-

ous paths for the flow of the lightning surge to the earth. The carhouse replacing the one destroyed is of much better construction from a fire underwriter's standpoint. It is divided into sections of not more than three tracks per section, and all openings and walls between these sections are protected on both sides by automatic fire doors. Special hazards, such as carpenter, blacksmith, paint shops, etc., are segregated each in a separate section, and A.D.T. and private watchman clock systems have been installed. All car heaters also have been gone over so as to make them comply with the Fire Underwriters' standard.

In another instance cited by the speaker, smoke was seen coming from a stored car by the night watchman, but he was slow in turning in the alarm. The fire spread rapidly, and soon an exposed metal truss supporting the gable at one end of the carhouse buckled and came down with the brick gable across the entrance. This prevented the removal of cars. By prompt work, aided by the fact that the carhouse was divided into bays with fire doors at the openings, the fire was confined to the section in which it started. It is believed that this fire started from a defective heater. The heater blower motor stalled and became overheated, causing air circulation to be shut off.

In another case cited by the speaker, the carhouse was of good construction, but the water for the fire hose connections was furnished by a tank which was inadequate in size. Had the water supply been adequate, a fire which developed could easily have been confined to the immediate vicinity of its origin.

Another case was cited of a company which carried its own insurance on a power plant, in which oil switches were in a lean-to outside the main building, but communicating with it through a small opening. The fire started in this lean-to, and before it was extinguished there was a loss of more than \$100,000. This more than wiped out the company's insurance fund.

Mr. Mahan quoted instances of material reduction in insurance rates through the installation of changes recommended by the Underwriters' Inspection Bureau, the annual saving in insurance cost being in some cases more than 50 per cent of the cost of installing the improvements.

In closing, Mr. Mahan summarized briefly some of the outstanding things which can be done on every property to reduce the fire risk and thus the fire loss, and spoke particularly of the need of standardized heaters according to the Underwriters' requirements.

BUSINESS PRINCIPLES APPLIED TO SELLING TRANSPORTATION

John Dewhurst, associate editor of *ELECTRIC RAILWAY JOURNAL*, read a paper in which he drew a comparison between riding on electric cars and

buses and the popular sales of other commodities. He pointed out that a basic marketing law indicates that 60 per cent of the product will be sold at the popular price. This popular price is the lowest price for the quality that meets the popular idea of a satisfactory performance. Qualities above this standard, selling up to 25 per cent above the popular price, have a demand amounting to only 30 per cent of the total quantity. For qualities below the standard there is a demand for only 10 per cent of the total volume.

Referring to the market for passenger-miles, he stated that it appears that common carrier cars and buses are now supplying only 28 to 40 per cent of the total market. The theory advanced by Mr. Dewhurst is that the economic carriers, cars and buses, are supplying a service just a little below the popular idea of a satisfactory service today and hence cannot obtain the 60 per cent of the business to which these carriers are rightfully entitled. Almost overnight, he said, the industry has been changed from a monopoly to a highly competitive industry with an improved commodity as a serious competitor. Elimination of noise and increased speed, coupled with modern methods of operation, are necessary hurdles to be jumped before the proper volume of business can be gained. The vehicle is the most important element of modernization. The car of tomorrow must embrace more modern features. Such a vehicle must be built for better service, not necessarily for economies of operation, although that may go hand in hand with other improvements. The light-weight car is an example of combining features of economy and better business getting. A modern vehicle, coupled with operating methods designed to get business, will put the electric railway in position to go ahead and produce.

MAINTENANCE AS A MEANS OF SELLING SERVICE

Maintenance as related to selling service was discussed by Jonathan Wolfe, assistant superintendent of tracks and roadway Chicago Surface Lines, and M. W. Cooke, superintendent of current control Pittsburgh Railways. Mr. Wolfe told of the 100 new cars just purchased by his company and the extensive reconstruction of tracks in the city streets of Chicago in the face of an expiring franchise. Many blocks of track are being reconstructed, using 130-lb. rail with yellow pine ties on either 6-in. concrete or 8-in. rolled stone base. Manganese welding of low joints properly ground off is bringing back much worn track into good condition. High carbon steel is also extensively used. Every complaint of poor track reported by outsiders or company men is noted in a track ledger and a complete record is kept until the trouble is corrected. Mr. Cooke showed graphically the progress his company has made in reducing trolley breaks and at the same time reducing maintenance costs. Life of trolley ears has been taken as a gage to measure life of other trolley equipment.

Many good and bad examples of advertising cards were shown by Labert

St. Clair in his talk on advertising for traffic. Mr. St. Clair warned against the so-called "clever" or "trickily worded" sign as being dangerous. The best signs, he said, are basic truths stated in not more than five words. Policy, performance and publicity define the program of a company entering an advertising campaign. The best mediums to use are, in their relative order of merit, the company publications, newspapers, billboards, movies and general advertising.

Harry Brown, secretary Ohio Brass Company, read H. M. Lytle's paper telling of how the employees of the Chicago, North Shore & Milwaukee sell transportation. An abstract appears elsewhere.

USING THE BUS TO DEVELOP EXCURSION BUSINESS

Buses as used to develop excursion business was the subject of a talk by L. H. Palmer, vice-president Fifth Avenue Coach Company. Mr. Palmer's experience along the lines of his talk was gained largely during his connection with the United Railway & Electric Company of Baltimore. In Baltimore a sightseeing business was established more than a year ago. In Mr. Palmer's opinion the electric railway company of a community should be the purveyor of all transportation except that provided by steam roads.

Operations of the Kentucky Carriers, Inc., a bus subsidiary of the Louisville Railways and operating seventeen city-type buses, were described by G. B. Powell, general manager. Mr. Powell started a bus excursion business last year and up to June of this year had run 2,000 miles at an average gross of 51 cents per

mile. Some 4,000 miles was scheduled for June at an estimated gross averaging 49½ cents. The popular charge for sightseeing tours is a flat charge including incidental costs. Long tours should include in the total meals and rooms at the best hotels.

New York Railroad Club Has Enjoyable Outing

"BACK TO BOYHOOD" was the slogan of the large gathering of steam and electric railway officials, employees and supply men of the New York district who congregated at Travers Island, July 8, for the annual outing of the New York Railroad Club. Golf, baseball, tennis, quoits, together with track and swimming events, were among the sports indulged in. Those who played golf went out early in the morning and played at the Wing Foot Golf Club at Mamaroneck until noon. A special train which conveyed about five hundred more left Grand Central Station, New York, at noon. On arrival at Travers Island a buffet lunch was served, after which the athletic events began. The Sunrise Trail Band of the Long Island Railroad furnished inspiring airs for the would-be athletes. An informal dinner at night concluded the merrymaking.

Strike conditions on the Interborough subway in New York kept a number of the electric railway men away from the festivities, but many employees of nearby electric railway lines which were not affected by the railway strike were well represented. The Long Island Railroad had a large delegation and its athletes carried off most of the prizes in the track and field events.

How Employees Can Sell Transportation*

North Shore Line Employees Conduct Successful Campaign for More Business—Prizes by Company Stimulate Efforts—Central Sales Committee Directs Drive

BY H. M. LYTLE

Vice-President Chicago, North Shore & Milwaukee Railroad

PROBABLY the first requisite to having "employees sell transportation" is to ask them to do it. That may seem rather patent, but the fact is that very few transportation companies have talked to their employees about it. On the other hand, it is unfair merely to ask them to sell transportation without giving them a concrete idea of what you have in mind, or not to have a selling organization to tie to. Setting up such an organization is not as difficult as where the employees are asked to take part in a customer-ownership campaign of a company's securities.

Since Jan. 1, 1926, the men and women who make up the family of the Chicago, North Shore & Milwaukee Railroad—the North Shore Line—have been engaged in an organized "Better Business" campaign. Britton I. Budd, president of the North Shore Line, had been considering asking the employees to sell service

in a definite way for some time, and on that date named a general committee, composed of Jesse S. Hyatt, general manager; M. J. Feron, general superintendent of transportation, and F. W. Shappert, traffic manager, with C. Edward Thorney, an expert traffic man, as secretary. In his letter Mr. Budd said: "It is my hope that every man and woman associated with the North Shore Line shall be enlisted in this campaign. It is my belief that it will prove one of the most popular and beneficial efforts that has been attempted by the North Shore Line." Then, to make the campaign interesting, he authorized awards to total \$5,000 for those making the best selling records during the year.

RESULTS OF FIVE MONTHS' EFFORT

To digress from a connected story of just how the campaign was organized, it may be interesting to note a number of results of the first five months of effort, as follows:

More than 4,500 new business tips touching every phase of the transpor-

*Abstract of paper at summer meeting of Central Electric Railway Association, SS. *South American*, June 28-July 2, 1926.

tation which the company has to offer were turned in by men and women of the company. In order to sell the road, it has been necessary for every employee further to sell himself; in other words, he has had to become possessed of the fullest information.

While the best of team work has always prevailed among the North Shore Line family, nevertheless the teaming together in hot competition has further developed this spirit of co-operation and good fellowship.

There is a fuller understanding of the railroad's problems than at any time in its history.

The families of all employees on the railroad are interested in the campaign and have heard so much about the road's affairs that members can talk about it almost as fluently as those who are directly on the payroll.

The 11,000 stockholders have been kept advised monthly through a publication which they receive and have been valuable business getters.

Practically all business men in every community served by the railroad know about the road's activity. It has greatly increased their estimate of the company as a live, up-to-the-minute, business-getting organization—one with which they like to deal.

Primarily, the campaign develops two classes of business: one, that which the employees themselves can handle directly, and the other, "leads" which the traffic department experts can follow up. Combined, the two mean an intensive combing of the territory.

The question that is always asked is, "Is the interest of the employees sustained?" The answer to that is seen in the figures from month to month, which have shown a consistent growth both in the number of employees actively participating and in the number of tips turned in to headquarters.

ORGANIZING THE SELLING CAMPAIGN

Summarized briefly, the campaign organization was developed through the holding of a meeting by the general committee of about 100 of the liveliest wires in the organization. These were not necessarily department heads or even persons in supervisory capacities. At this meeting the idea was carefully outlined.

These men were those whom it was felt would naturally be the captains and lieutenants of the organization. The general committee then thoroughly canvassed the entire organization and made appointments of captains and lieutenants that constituted a total of seventeen teams, each representing a department or a particular service of the company. Each was given a captain and lieutenant.

Then there were five field agents appointed and they were given supervision over certain numbers of teams. The field agents report directly to the general committee.

The teams were allowed to pick additional lieutenants as were necessary, but were pledged to enroll in their membership every employee on the payroll.

To help in the organization work, a letter was sent out by the general committee to every employee at his or her

COMING MEETINGS OF *Electric Railway and Allied Associations*

July 22—New England Street Railway Club, annual outing, Portland, Me.

July 23-24—Central Electric Railway Accountants' Association, meeting, Drake Hotel, Chicago, Ill.

July 28-30—Electric Railway Association of Equipment Men, Southern Properties, semi-annual meeting, Chattanooga, Tenn.

Aug. 11—Metropolitan Section A.E.R.A., annual outing, Pelham Bay Park, New York.

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

Sept. 17-18—Mid-West Claim Agents Association, sixth annual convention, Elms Hotel, Excelsior Springs, Mo.

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

Oct. 10-15—Congress International Tramway, Local Railway and Motorbus Association, Barcelona, Spain.

Oct. 25-29—Annual Congress and Exhibit, National Safety Council, Detroit, Michigan.

Nov. 16-18—Society of Automotive Engineers, National Transportation and Service Meeting, Boston, Mass.

home address, outlining just what the campaign was to be. This has since been followed by other letters from the headquarters office and supplemented by frequent letters from the team captains to their team members.

A headquarters organization was formed to look after both the clerical work and also to act as an organizing force to help out the teams.

A credit system was devised whereby each individual obtains a credit for each tip he turns in. This is carefully noted on an individual card in the office files and a credit is also given at the same time to his team. If the tip actually develops business, he is given additional credit and, if it is especially large or important business, possibly two or three credits. These credits will be totaled at the end of the year to determine how the \$5,000 of award money shall be distributed. In this way it gives positive assurance to the individual that he will get full credit for everything that he does.

Following the organization meeting there were other meetings of team captains and lieutenants where the company's situation was carefully gone into and information given as to particular classes of business which the company was anxious to develop. From the start the employees showed a preference for developing merchandise despatch business and it has been necessary to hammer the passenger end of the business.

Each team has a definite quota for each month, based on the number con-

stituting it. A monthly sheet is kept, with a thermometer illustration, and it is posted in all places where employees congregate. This gives them complete, up-to-date information as to where the teams stand and promotes the competitive spirit.

Large space is given each month in the employee publication—the *High Ball*—to the campaign. This gives a great deal of information that can be used in selling, tells of meritorious work by individuals and is a valuable medium for arousing enthusiasm.

LESSONS LEARNED FROM CAMPAIGN

Further backing up the effort, every meeting of employees, whether departmental, safety, A.E.R.A. section or small group gatherings, is spoken to by some one representing the campaign.

A considerable newspaper advertising program has been carried on in the territory, a series of advertisements on "Facts About the Company" being a big feature.

After the campaign had been under way two months some special awards of extra prize money for particularly good effort were given; this is being continued at irregular intervals. The amounts of these special awards are determined by the general committee.

An interesting feature of the effort is that at the end of May seven teams had scored 100 per cent or better of their quotas; this in spite of the fact that the marks were set very high. It is interesting, too, that the leaders were the teams constituting the baggage department, trainmen on the Waukegan city lines, the freight men in the merchandise despatch department, trainmen on the Milwaukee city lines, the station agents and the motor coach men, which includes the drivers.

These conclusions are apparent in answering the question raised by the title of this paper:

1. If the management is wholeheartedly behind the selling campaign and transmits its enthusiasm down through the organization, then the employees will be the most valuable of all selling agencies at the company's command, for the employees are "the company."

2. There is need of expert direction. A traffic expert, just as skilled at his job as is the construction engineer at his, should direct the campaign. That does not mean a "theoretical expert," but one who has had real transportation salesmanship experience.

3. Before the employees can wholeheartedly sell, they have to be sold on the management, upon their immediate superiors, upon the service they have to sell.

4. If they are sold and actively start selling, it is inevitable that they, because of their collective acquaintanceship, will bring a vast volume of business to the railroad which it would not obtain in any other way. In addition, they give the company a standing with the public which only a thoroughly "sold" family of employees can bring about.

THE MODUS OPERANDI

Accompanying Mr. Lytle's paper were a number of exhibits of details employed in the active conduct

of the campaign. They included the following:

A blueprint showing the organization of the seventeen different teams, which are arranged in five groups, as follows: (1) Dining and parlor cars, baggage, Chicago station employees, merchandise dispatch. (2) Maintenance of way, construction, transportation, mechanical. (3) Architectural, motor coach, general office. (4) Through service, new industries, Milwaukee city lines. (5) Electrical, Waukegan city, station agents. Each of these groups had a field agent, reporting through the general sales committee to the sales director, Mr. Lytle.

A thermometer chart showing the monthly standing of the seventeen teams mentioned above. These charts are posted in all places where employees congregate. At the side of the chart is a drawing of a thermometer giving the average of all of the teams, and adjoining it are seventeen columns showing the record to date of the individual teams.

Copy of a letter sent to the home of each employee on Jan. 1, 1926, outlining the plan of the better business campaign. It was signed by the general sales committee, gives particulars of new improvements made by the com-

pany as reasons why a better business campaign should succeed at the present time and tells of the offer by President Budd of \$5,000 as prizes.

A later circular sent to all employees describing the organization of the different teams, with the explanation that each individual should also try to make a record for himself. This circular described the method of awarding credits by saying a card index would be kept for each individual of the new business "tips" which were received from him.

Another circular giving talking points about the service, and a questionnaire sent out by field agents to all members of the team under his direction.

Three "pep" type of letters about the campaign sent by the secretary to all employees. One of these explained that the results of the campaign were so gratifying that President Budd had authorized a number of additional awards to individuals for special service in addition to the \$5,000 previously announced. The names of those receiving such prizes are given.

Copies of the company's publication, the *High Ball*, showing how extensively the campaign was featured in that magazine, which goes to the homes of all employees.

pay; for our ability to pay measures accurately the value of the franchise that has been granted to us, whether it remains a complete monopoly or a broken monopoly under the influence of the multitude of private automobiles that do the work which we once performed.

METHODS OF TAXING PUBLIC UTILITIES WERE STUDIED

Now, what are the methods in use today for taxing public utilities? At the suggestion of Mr. Storrs and the Advisory Council, I undertook a year ago to study the taxation burden of thirteen selected electric railway companies and to find, if I could, the underlying principle upon which their taxes were levied. I was able to determine the burden of their taxes all right, but when I came to determining the principle that underlay that burden I met with nothing but failure, and the reason for this is that there is no underlying principle.

In order to be brief and avoid boring you with figures, let me say that there are two main methods in use. One that is used very seldom is the capitalization method, but this one is so fully discredited that I shall not take time to discuss it. Most of the states follow the ad valorem method, under which an attempt is made to tax the utility according to the same principles that guide assessors in arriving at the value of other properties such as real estate. But experience has shown that under regulation you cannot determine the value of a utility as you can that of other economic property that is not regulated, and the ad valorem method has broken down in almost all those cases where the earnings of the utility have not been given major weight in the determination of value.

Furthermore, in states such as Ohio, where the law demands that property be assessed at 100 per cent of its value, it has become a notorious fact that local assessors willfully ignore this provision of the statute in regard to general property and enforce it in regard to public utilities. The result of this has been that in Ohio many examples exist of whole counties taxed on an assessment of 40 to 50 per cent of the value of general property, while the public utilities in the same counties have been carrying a tax of a full 100 per cent of their value. But then, corporations have no vote, while general property owners have.

EARNINGS THE REAL BASIS FOR TAXATION

Now if, under the ad valorem system of taxation, it has been found necessary to give the greatest weight to earnings, why not frankly admit that earnings furnish the real basis of taxation for a utility? Why bother about capitalization and valuation when in earnings you have a simple, efficient and accurate measure both of tax-paying ability and for obligation to the body which grants the franchise? Senator Davenport's committee of the National Tax Association summed it up when he said: "The ad valorem basis lacks simplicity. It is apt to become arbitrary, its administration is difficult and expensive. It is not an accurate measure

Relief of Taxation and Imposts—A Hopeful Outlook*

Readjustment of Burdens According to Ability to Pay Will Bring the Utilities in Line with Other Business—Combined Gross and Net Tax Urged as Most Equitable

BY LESLIE VICKERS

Economist American Electric Railway Association, New York City

RELIEF from taxation and imposts are the two directions at the present time toward which we can look hopefully for help. We have gone a considerable distance in fare increases, and in some cases have reached the barrier beyond which we dare not go for fear of discouraging car riding; we have just put into effect every economy of management that we could think of. We have done much to reduce our wage cost by the introduction of one-man cars, and by the use of bigger cars have reduced costs of operation and upkeep costs. But in the matter of taxation and imposts we have frequently found ourselves helpless in the presence of taxing bodies who were relentless in their determination to get out of us the last cent they could. It was not so bad when we enjoyed a monopoly and could pass the increased cost on to the car rider. It was up to him to pay us, as he would any other collector; and while he did not always stop to think that the fare he paid for his ride was a real tax and was passed on to some governing body, yet he paid just the same because he had to. Then came the private automobile and the greatest revolution in transportation history.

I have really no quarrel with regulation. I believe it has come to stay and

*Abstract of paper at summer meeting of Central Electric Railway Association, SS. *South American*, en route Buffalo to Chicago, June 28-July 2, 1926.

IT IS quite certain that a gross earnings tax alone will never remove inequalities and injustices. But a combination of the two methods—gross earnings and net earnings—will come as close as any tax that has ever been devised toward producing equalities among the utilities themselves and toward bringing them into line with the taxes that ordinary unregulated businesses have to pay. Besides it will bring to the state a more definite income yearly with which to meet the expenses outlined in its budget, and thus avoid the criticism that the utility is escaping taxation because it is badly managed.

is in the best interests of the public. But what I would plead for today is a recognition by the public of the injustice of imposing twentieth century regulations on the same industry that has to put up with our eighteenth century system of taxation. In a word, I am pleading for the recognition of the principles that the only fair and just method of taxing a regulated industry is according to its ability to

of the obligation or ability to pay taxes. It does not succeed in placing a burden of taxes equitably.

"The tax on earnings is strong at the points where the ad valorem basis is weak. The earnings of a corporation are the real basis of its work and its tax-paying ability. The earnings tax involves the fewest theoretical conditions and is simple and inexpensive to administer. Earnings are a matter of fact about which there will generally not be disagreement. The determination of net earnings does involve certain valuations, but in general the element of personal judgment is relatively small as compared with the property tax. The earnings tax is simple and clear. It usually fluctuates with the prosperity of the tax-paying corporations and it is generally equitable between corporations."

While most of us feel that we are

I HAVE really no quarrel with regulation. I believe it has come to stay and is in the best interests of the public. But what I would plead for today is a recognition by the public of the injustice of imposing twentieth century regulations on the same industry that has to put up with our eighteenth century system of taxation. In a word, I am pleading for the recognition of the principles that the only fair and just method of taxing a regulated industry is according to its ability to pay, for our ability to pay measures accurately the value of the franchise that has been granted to us, whether it remains a complete monopoly or a broken monopoly under the influence of the multitudes of private automobiles that do the work which we once performed.

suffering under burdensome and discriminatory taxes, few of us realize just how heavy and unequal those burdens are. Again, with a desire to avoid figures and details as much as possible, let me simply state that in this investigation which we made we found that local taxes varied all the way from 1½ to nearly 10 per cent of the gross; state taxes varied all the way from nothing to 6½ per cent of the gross, while federal taxes in so far as they represent profits are almost negligible. Or, take another comparison. It was shown that in 1923 business corporations generally, including transportation companies, paid out a little more than 2 cents on every dollar they took in, for taxes. This group of electric railways paid out 7.7 cents; but of their net income before taxes corporations generally surrendered 27½ per cent, while these electric railways paid out 63.59 in taxes and an additional amount in inescapable imposts. And, while corporations generally paid taxes to the extent of 38 per cent of their corporate net income, these street railways were burdened with a tax amounting to

almost 200 per cent and a burden of taxes and imposts combined of 265 per cent. As a matter of fact, they are better off than the electric railway companies generally throughout the country, for an investigation of their situation discloses the fact that in 1924 the relation of their taxes, corporate income or net after taxes was 343 per cent.

It is fair to assume that we have now reached the point in our political as well as our business life where we realize that the fairest basis of any taxation is that which applies the principle of ability to pay. The public utilities have never so far been taxed under this principle, for they have been regarded as tax gatherers supplying the government with an easy and effective method of providing the money called for by their budgets. The group of people which utilities serve are usually scattered over wide areas and are for the most part unable to make their voices heard in protest. It is only when the bondholders of the utilities are affected that real action is taken and an effort made to get rid of burdens which fall not only on them but upon the consuming public as well. Equality of taxation is guaranteed by the constitution of almost every state. Equality by no means is to be considered as "the same amount." It means equality of burden, and the burden can only be estimated by ability. Therefore, an ad valorem tax, unless based exclusively upon the item of earnings—in which case it ceases to be a true ad valorem tax—can never provide a satisfactory basis for ability to pay. The main point in regard to taxation from a historical point of view is that despite the fact that complete regulation has characterized the industry for a number of years and that it has been singled out from ordinary businesses and not allowed to make that economic profit which is the reason for their existence, little or no effort has been made to readjust taxes in accordance with the changed conditions. The fact is that our legal and regulatory procedure has advanced much more rapidly than our tax procedure, and that the willingness of the body politic to impose restrictive and regulatory legislation upon the industry has not been matched by willingness to adjust the tax method conforming to this new principle.

OLD-FASHIONED TAXATION METHODS STILL PERSIST

The result of this has been that in many places the old-fashioned method of taxation by local assessors of little bits of the public utility system still persists; that state commissions and assessors usually look upon public utilities as the ones that will readily serve their purpose for gathering in those taxes which the legislature has made up its mind that it is going to spend; and that the great voiceless throng, made up for the most part of people of scant or moderate means, has quietly had to submit to a heavy burden of taxation. This might not be so bad were it not for the fact that the rights of capital, honestly invested, to earn a fair return have been almost totally ignored, and while many companies have been liberally taxed into bank-

ruptcy many more have been kept on the ragged edge of poverty—a condition which has prevented them from maintaining their self-respect and giving to the public that form of service to which it is entitled.

The joint committee on taxation and retrenchment of the state of New York did not exaggerate when it said that the system of taxation in that state was the despair of every student of the subject. Every study of taxation that is made points out the great inequalities of tax burden, not only between the various groups of industries, but also among the public utilities themselves.

Almost all the blame can be laid at the door of two groups: (1) the local tax officials, who are greedy for everything they can get out of the public utility; and (2) at the door of the state taxing authorities, who still adhere in

IT IS fair to assume that we have now reached the point in our political as well as our business life where we realize that the fairest basis of any taxation is that which applies the principle of ability to pay. The public utilities have never so far been taxed under this principle, for they have been regarded as tax gatherers supplying the government with an easy and effective method of providing the money called for by their budgets. The group of people which utilities serve are usually scattered over wide areas and are for the most part unable to make their voices heard in protest. It is only when the bondholders of the utilities are affected that real action is taken and an effort made to get rid of burdens which fall not only on them but upon the consuming public as well.

most cases to the time-worn and out-of-date ad valorem system of taxation.

Quite a good case could be established by the argument that since public utility property is devoted entirely to public use, it should therefore escape taxation to the same degree as a court house or capitol building; but, as far as I know, there is no one within the industry and few outsiders who advocate such an exemption. I do not know of any subject upon which there is a greater unanimity of opinion among tax experts and economists than that of what constitutes the proper basis for the taxation of public utilities. A long list of experts might be quoted in favor of the contention that they should be taxed exactly according to their earnings.

Under the condition of regulation to which public utilities now are almost entirely subject, the object or purpose of public utility tax should be to supplement rate regulation and bring to the state as much as possible of those profits that arise through favorable franchise arrangements; but where the

franchise arrangements are unfavorable, due in part to the state and its regulation, the state cannot in fairness expect to gain in the form of taxes.

GROSS OR NET EARNINGS?

Now if we admit that earnings constitute the basis of just taxation for utilities—and I do not imagine there will be many dissenting voices in this group at least—then how are earnings to be measured? Is it to be gross earnings or net earnings? It is admitted that "net" earnings is the ideal base from a utility point of view, but it should not be forgotten that every company which enjoys the protection of the state, whether profitable or unprofitable, owes something to the state under which it operates its franchise. It might also be argued that the larger the company the more it should pay and that its size is fairly represented by its gross earnings. But gross earnings by themselves can be fully as unjust as the ad valorem method; for a utility, due to the conditions under which it has to operate, may have an enormous gross and no net, while another utility alongside it may have a small gross and a high proportion of net.

It is quite certain that a gross earnings tax alone will never remove inequalities and injustices. But a combination of the two methods—gross earnings and net earnings—will come as close as any tax that has ever been devised toward producing equalities among the utilities themselves and toward bringing them into line with the taxes that ordinary unregulated businesses have to pay. Besides, it will bring to the state a more definite income yearly with which to meet the expenses outlined in its budget, and thus avoid the criticism that the utility is escaping taxation because it is badly managed.

What is the gross-net tax? It is not a new idea nor a new method. It is not the wild dream of an unknown and unimportant economist, but the definite recommendation of the most thoroughgoing and expert committee that has ever been brought together to consider taxes—the special committee on taxation and retrenchment of the state of New York which reported in 1922. It is the recommended method of the National Tax Association, which comprises almost all the foremost tax experts and commissioners throughout the country. It is the method that has the approval of such international figures as Professor Seligman of Columbia University, Professor Fairchild of Yale and Professor Bulloch of Harvard. In fact, I do not know of any single prominent economist or tax expert that has had a word to say against it—and yet it has never been adopted by a single state in the Union.

What the gross-net tax proposes to do is this: To tax all public utility corporations according to their gross in relation to their net earnings, the gross earnings being defined as "all receipts from the operation of a public utility," and net earnings being defined as "net earnings from the operation of a public utility after deductions of operating expenses and taxes assignable to operation except the gross-net

tax itself." It is hoped, of course, that the gross-net tax will be the *only* tax imposed and that by a system of reapportionment to the individual communities, every other tax and impost burden will be removed as unnecessary and unjust.

No definite schedule could be laid down for all the states, since their budget requirements differ so widely. But for the state of New York, in order to bring in to the treasury almost the same amount of money as was being paid by the utilities under the multitude of taxes that affect operators, the following schedule was suggested:

Every company shall pay an annual tax that shall be the percentage of gross earnings fixed herein:

1. When it has no net earnings or its net earnings do not exceed 5 per cent of its gross earnings—1 per cent.

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2. When its net earnings exceed 5 per cent of its gross earnings but do not exceed 10 per cent—1½ per cent.

3. When its net earnings exceed 10 per cent of its gross earnings but do not exceed 15 per cent—1¾ per cent.

4. When its net earnings exceed 15 per cent of its gross earnings but do not exceed 20 per cent—2 per cent.

5. When its net earnings exceed 20 per cent of its gross earnings but do not exceed 25 per cent—2½ per cent.

6. When its net earnings exceed 25 per cent of its gross earnings but do not exceed 30 per cent—2¾ per cent.

7. When its net earnings exceed 30 per cent of its gross earnings but do not exceed 35 per cent—3 per cent.

8. When its net earnings exceed 35 per cent of its gross earnings but do not exceed 40 per cent—3½ per cent.

9. When its net earnings exceed 40 per cent of its gross earnings—3 per cent.

I have recently had the pleasure of working with a committee of the Wisconsin Utilities Association and drew up for it a schedule which calls for a tax of 1 per cent on corporations having no net or a net of less than 5 per cent of their gross and ranging up to 7 per cent of the gross in the case of those utilities whose net was in excess of 40 per cent of their gross. No one can complain that this is a light tax. Indeed, if the manufacturers of Wisconsin were to be taxed in the same principle as we are proposing for the public utilities there, they would have to shoulder a burden 30 per cent heavier than they carry today, and I

believe that we would find that something like the same conditions exist in almost all states.

It is not hoped that the introduction of the gross-net tax will immediately relieve the public utilities of the burden under which they operate. In my opinion, it would probably be a mistake in judgment to suggest a change in the method of tax and in the amount of taxation at the same time. It would be far better for the utilities to agree to pay as a whole for the coming year that amount of taxation which would be imposed upon them under the ad valorem method, or perhaps the same amount as in the previous year for the industry as a whole. Then using the figures which we have obtained and apportioning a gross-net tax on the basis of these figures, it will be apparent to the commission and ultimately to the Legislature and the people they represent that the public utilities are paying a heavy proportion of their net in taxes. When this is fully realized, it will be opportune to ask for a reduction in the interests of equalization of the tax burdens of those who go up to make the state.

TAXES READJUSTED

The gross-net tax will undoubtedly change the amount of taxes paid by the various utilities, some getting relief and others being more heavily burdened. This condition will have to be faced by the industry as a whole, and my hope is that it can be borne for a year, in view of the possible lightening of burden which we can hope for the industry as a whole at the end of that time.

The advantage of simplicity and ease of operation and application of the gross-net tax by the tax commission must not be lost sight of. It would make the administration of the tax commission an unusually simple matter as far as the utilities are concerned. It would avoid appeals and disputes which now take up a great deal of the commission's time. It would be fair as between the industries that comprise the public utility group. It would be flexible.

Some opposition will naturally be made to such a measure, since it proposes to tax utilities by a different method than that which applies to ordinary commercial property; but in some states telephone companies are already taxed by a different method and, after all, method must be made subservient to equality. In adopting the earnings factor as the most important one in determining the ad valorem method of taxation, the commissions have already thrown over completely the basis upon which taxation in the past was founded. This they had to do as the only logical step following regulation which so completely altered the economic outlook of public utilities.

I present this idea on taxation of public utilities as the most hopeful avenue of escape that we have from a burden that is rapidly becoming unbearable and which is responsible in large measure for the depletion of electric railway properties throughout the country. We are between the devil and the deep sea—the devil being the regulatory bodies that say how much

we shall take in in revenue, and the deep sea being the taxing authorities that say how much we shall pay out in tribute to them for the privilege of operating a utility.

In our fight for lower and less discriminatory taxes we represent not only the owners of millions of dollars worth of invested funds but the millions of car riders who belong to a class of society that is least able to pay high taxes, for the rich have their own private automobiles and patronize our services but little; whereas the great mass of middle and lower class of people, who have been excluded from the federal income tax burden on the grounds that they are unable to contribute, ride the street cars and pay for the privilege a tax more burdensome than that imposed upon any other industry.

Let us awaken them to a knowledge of the conditions. Let us get the information before them through advertising, through Rotary and Kiwanis Clubs and boards of trade and let us enlist their help toward putting the electric railway industry back where it belongs as the cheapest, safest and cleanest and most efficient method of street transportation.

International Congress Announces Program

PLANS for the twentieth congress of the International Tramway, Local Railway and Motorbus Association have been sent out by President Fr. de Lancker and General Secretary A. de Backer. The congress will be held on Oct. 10-15 inclusive at Barcelona, Spain. Following is the provisional program as announced:

Sunday, Oct. 10

Registration and announcements.
10:30 p.m.—Reception to delegates.

Monday, Oct. 11

10:30 a.m.—Opening session; address of welcome; first technical session.
1 p.m.—Luncheon as guests of the Marquis of Foronda, president of the local executive committee of the association.
5 p.m.—Second Session.

Tuesday, Oct. 12

10 a.m.—Third Session.
3 p.m.—Visit to bull ring.
7 p.m.—Fourth Session.

Wednesday, Oct. 13

10 a.m.—Fifth Session.
1 p.m.—Luncheon as guests of Cataluna Railways.
3:30 p.m.—Visit to Sabadell and Tarrasa, served by the Cataluna Railways.
9 p.m.—Banquet given by his Excellency the Mayor of Barcelona.

Thursday, Oct. 14

Excursion to Montserrat; luncheon given by the Catalan Railway.

Friday, Oct. 15

10 a.m.—Sixth Session, general business meeting; meeting of executive committee.
1 p.m.—Luncheon at Tibidabo, guests of the Barcelona Metropolitan Railways (subway) and Great Metropolitan Railway (suburban railway system), to be followed by visits to the shops of these companies.
8:30 p.m.—Banquet, guests of Barcelona Tramways; closing of congress.

On Saturday morning those who desire can leave for Madrid, where the delegates will be guests of the Madrid Tramways. Sunday will be devoted to sightseeing trips in Madrid. Monday an excursion to Toledo is planned, and Tuesday will be devoted to an inspec-

tion of the Madrid Tramway System and shops.

In connection with the congress, a program of entertainment has been arranged for the ladies.

F. L. Blanchard Heads Utility Advertising Association

NEW officers were elected by the Public Utilities Advertising Association during a recent meeting in Philadelphia. As now constituted the personnel of the association is: Pres-

ident, Frank L. Blanchard, Henry L. Doherty Company. Vice-presidents, George F. Oxley, National Electric Light Association; Hal. M. Lytle, Chicago Rapid Transit Company. Secretary, Henry Obermeyer, Consolidated Gas Company of New York. Treasurer, Charles W. Person, American Gas Association.

The association is one of the youngest departmentals of the International Advertising Association, but the public service group reported a membership of more than 300, representing 225 utility companies throughout the country.

Advantages of Electric Drive for Gasoline Buses*

Higher Speeds, More Efficient Utilization of Engine, Less Mechanical Strain and Reduced Maintenance Costs Are Obtained with This Type of Vehicle

BY H. L. ANDREWS

Assistant Engineer Railway Department,
General Electric Company

SEVERAL factors contribute to the ability of the electric drive to maintain higher average speeds than the mechanical drive bus in frequent stop service. Of chief importance is the elimination of the time lost in shifting gears during each acceleration or on grades. An expert driver trying to make a fast schedule with mechanical transmission can shift gears and let the clutch into complete engagement in about 1.5 seconds. The average driver trying to avoid jerking the passengers and clashing gears requires from 2.5 to 3 seconds for each gear shift. On level runs, with four-speed transmission, drivers may start on second gear and thus have three shifts to make on each acceleration, which consumes from 5 to 8 seconds. During the period of changing from one gear to another the engine is not only doing no useful work but there is an actual retardation of bus speed.

To compensate for these sags in the acceleration curves many drivers will operate engines at excessive speeds in second and third gear to obtain high power output from the engine and high tractive effort at the rear wheels. Unless the engine speed is brought to a very high point in third gear the speed when starting on high is so low as seriously to reduce the rate of acceleration. These features are inherent in mechanical transmission where engine speeds and wheel speeds are directly proportional and in each gear position the engine speed and its power must operate over a wide range.

With the automatic electric drive the characteristics of the generator and motors are such that the engine may be quickly increased in speed from idling to a point of high output speed, and then gradually increased to maximum safe output with no intermission or lag. The result is operation at the most efficient part of the speed curve, a more constant power output and a

very appreciably higher rate of acceleration. This higher rate of acceleration permits higher schedule speeds, and experience indicates that under similar operating conditions a bus equipped with electric drive can maintain at least 10 per cent higher schedule speed than a bus equipped with mechanical transmission.

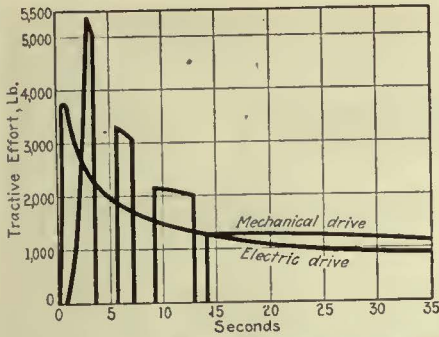
There is little question but that with expert drivers mechanical transmission can accelerate as rapidly as electric transmission, but it is not feasible in normal operation, and even though it were, it is possible that accidents would increase to such an extent that the pace could not be maintained. The Philadelphia Rural Transit Company is operating 235 motor buses with electric drive and maintaining schedule speeds of 11.5 to 12.5 m.p.h., which it is safe to say is materially higher than schedules maintained by mechanical transmission under similar conditions.

In actual service tests with electric drive the maximum engine speeds obtained during acceleration or when climbing severe grades are approximately 1,700 r.p.m., and normally in frequent stop service the maximum speed seldom exceeds 1,500 r.p.m. Similar tests with mechanical drive when attempting to maintain similar schedules show maximum engine speeds of 2,000 to 2,600 r.p.m. in the intermediate gear position.

Or, to put it another way, the electric drive reduces the engine peaks during acceleration approximately 40 per cent. In addition, during the retardation period, the idling and braking period, the engine revolutions with mechanical transmission are directly proportional to the bus speed. With electric drive the engine drops to idling speeds at the beginning of the retardation period and operates at this speed until the bus is again accelerated, when it is quickly brought up to a high output speed.

This feature, together with the lower peak engine speeds during acceleration, means less engine revolutions in a given service.

*Abstract of a paper presented at the semi-annual meeting of the New York Electric Railway Association, Bluff Point, N. Y., June 25.



Comparison of Acceleration with Mechanical and Electric Drives

Tests over an extended period in service with two buses using the same engine in each, exact duplicates in every respect except that one has electric drive and the other mechanical, proved that the engine of the electric drive bus operated at maximum speeds of approximately 1,650 r.p.m., while the same engine with the mechanical drive had to be operated at maximum speeds of 2,600 r.p.m. to perform the same schedules. The engine with the mechanical transmission made from 15 per cent to 22 per cent more revolutions per bus-mile than the same engine with electric drive performing the same work.

Torsional strain during acceleration on the engine, chassis, clutch and gears is recognized as contributing to high maintenance. With electric drive these torque surges are eliminated, which should reduce maintenance costs.

From an engineering viewpoint, compare the sharp surges which occur in every acceleration as the gears are shifted and the clutch engaged with the electric drive which starts off and continues to maximum with a gradually increasing torque without at any time putting a severe strain on any part of the mechanism. Dynamometer tests show that the electric drive cuts the peaks of torsion approximately 60 per cent.

COMPARATIVE FUEL CONSUMPTION

The question which occurs to the average operator is, Do you sacrifice fuel efficiency by the use of electric drive? The over-all efficiency of electric drive is approximately 75 per cent, which is less than mechanical transmission on direct gears, and for this reason it would seem that the fuel efficiency should be less. Results in service show that electric drive does not increase the fuel consumption beyond that required by the additional weight of equipment.

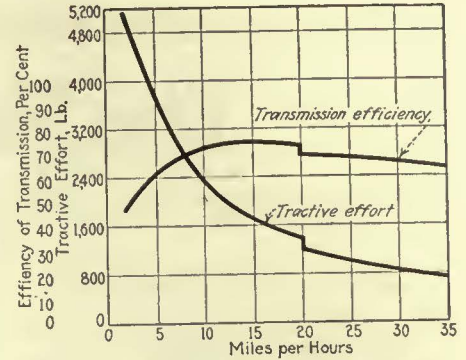
An 11-ton loaded bus equipped with mechanical transmission will operate from 4 to 4.5 miles per gallon of gasoline, or 44 to 50 ton-miles per gallon. The same vehicle equipped with electric drive will weigh approximately 12 tons loaded and will operate 3.5 to 4 miles per gallon of gasoline, or 42 to 48 ton-miles per gallon. This is far less increase in fuel consumption than is caused by the use of a six-cylinder engine instead of a four-cylinder, yet 75 per cent of all buses are today being equipped with six-cylinder machines.

One reason for this is partially the average lower speed of the engine with electric drive and every revolution of

the engine takes a certain amount of gasoline, whether that gasoline is consumed and properly utilized or not. Another reason is that with mechanical drive it is necessary to step up through several long trains of gears which are not very efficient and which limit the engine speed when starting to a period of low thermal efficiency. The fact that with electric drive the engine is not called on to deliver high torque at low engine speed permits the use of higher compressions at normal operating speeds, which increases the power and efficiency.

With electric drive the engine speed rises very rapidly to high output speed and then gradually increases to a maximum of 1,600 to 1,700 r.p.m. All through that cycle the electric drive works through the most efficient part of the engine characteristic.

As a matter of fact, any difference in fuel is relatively unimportant, as fuel costs are about 4½ cents per bus-mile, and any factor which affects fuel consumption 10 per cent will affect costs less than ½ cent per bus-mile. The most important item in costs is crew expense, and as this item is approximately 14½ cents per bus-mile, any factor which affects the schedule speed by 10 per cent affects the costs 1½ cents for crew wages only, and, furthermore, affects the fixed charges in the same ratio, because as schedule speed in-



Speed-Tractive Effort Characteristics and Corresponding Efficiencies of Electric Drive

creases the number of buses for the same service decreases.

The period of operation is too short as yet to make available any figures on relative maintenance. However, the Philadelphia Rural Transit Company and the Capitol District Transportation Company have doubled their inspection periods with electric drive and so reduced their garage expense.

After all, the most important point is high schedule speed with smooth acceleration, greater comfort for passengers, quiet operation and greater safety by reason of less manual duty on the part of the operator and better control of the bus.

American Association News

Hotel Reservations at Cleveland

MEMBERS planning to attend the convention of the association next October who have not yet sent in their reservations for accommodations in Cleveland, in accordance with a circular letter of April 27, 1926, of the hotel and housing committee, are advised to do so at the earliest possible moment. All such communications should be addressed to Paul E. Wilson, chairman hotel and housing committee, American Electric Railway Association, 403 Chamber of Commerce Building, Cleveland, Ohio.

Metropolitan Section Prepares to Show Its Form

MEMBERS of the Metropolitan Section are now preparing to go into training for the many athletic events scheduled for the second annual outing. Pelham Bay Park has been selected as the scene of these activities. The date is Aug. 11. First on the program will be the golf tournament, which is scheduled to commence at 9 o'clock in the morning. Details concerning the course, conditions for the tournament, etc., will be announced later by the chairman of the golf committee, E. B. Smith of the American Brake Shoe & Foundry Company.

No general arrangement has been made covering a mid-day meal for the members of the section who go on the outing. It is thought that

those who play golf probably will wish to get lunch at the club where the tournament is held. Others will be expected to bring their own lunches or get them at some neighboring lunchroom.

Athletic events on the program for the afternoon are of varied character. They include:

1. 100-Yard Dash.
2. Fat Men's Race (minimum weight, 220 lb.).
3. Tug of War between Manufacturers and Railway Men. (Each side will endeavor to drag the other through a mud hole or water hazard.)
4. Wheelbarrow Race. (Each contestant will be blindfolded and given a wheelbarrow to be placed as near as possible to some predetermined object, such as a tree, pole, etc.)
5. Boat Race. (Each contestant will row a given distance carrying a passenger in the stern of his boat.)
6. Quoits.
7. Baseball Game between Manufacturers and Railway Men. (It is understood that the railway men have discovered material of a very high order for the battery of their team.)

Activities of the afternoon will be followed by a dinner that is scheduled to start at 6 o'clock. Prizes for the athletic events will be awarded at the dinner.

Members planning to attend this outing are urged to procure their tickets as soon as possible. Each railway company has at least one representative on the ticket committee. Applications should be made to these representatives for whatever tickets are desired. Others may procure tickets from G. H. Ord, chairman; J. F. Craig or C. P. Westlake.

The News of the Industry

Jitney Issue Reopened

Resort Made to Injunctions and Counter Injunctions at Detroit—More Moves Likely

The fate of the jitneys operating in Detroit streets wavered with the closing of the month of June and was not definitely decided even when the Michigan Supreme Court sustained its former decision upholding the validity of the ordinance passed by the Detroit City Council barring the jitneys from the main thoroughfares.

Despite an announcement by the general manager of the Department of Street Railways that it would have 41 motor coaches purchased from the D. U. R. for runs on Jefferson Avenue, Grand River Avenue and Fort Street, and additional cars on Woodward Avenue, with a new skip-stop system to speed up service to care for the regular jitney patrons, Police Commissioner Croul stated that no immediate steps would be taken to drive the jitneys off the streets. The police department, instead, was working out a system of parallel routes for the jitneys. It was intended to ask the Council to revamp the jitney ordinance.

An opinion on the matter asked of the Corporation Counsel's office by Colonel Wallace, general manager of the D. S. R., was to the effect that the Michigan Supreme Court had upheld the validity of the jitney ordinance and that the ordinance should be enforced until amended. On June 30 Mayor Smith ordered that no jitneys be permitted to operate on the main streets of Detroit after that date. The Council refused to consider a resolution to extend the time for enforcement of the ordinance until further order of the Council.

Mayor Smith stated emphatically that the only amendment to which he would agree was one strengthening the ordinance and throwing the jitneys off the streets altogether. It was cited that if the Department of Street Railways is to give the best possible service for the lowest possible fare, it should have a monopoly, and that the fares collected by the jitneys should go to the D. S. R.

The president of the Council expressed the opinion that the best interests of the people cannot be served with several competing transportation systems operating in the streets and that the monopoly should be extended also to include the motor buses. He further stated that the D. S. R. is not the only consideration; safety must also be considered.

Representatives of the jitney drivers argued that it was an unwise move from a civic standpoint arbitrarily to order \$500,000 worth of rolling stock off the streets when transportation facilities are none too plentiful. The

jitney was referred to as the only present means of rapid transit offered to the public of Detroit. The president of one of the drivers' associations declared that the jitneys are not taking a fighting attitude and will not try to run against any official orders, but there is an urgent need for them and they are asking that they be allowed to remain.

A brief attempt was made to enforce the ordinance on July 1, but all attempts were abandoned after 10 a. m., at which hour the police and Corporation Counsel were served with copies of an injunction signed by Circuit Judge Harry J. Dingeman. The injunction restrained the city authorities from interfering with the operation of the jitneys until after a hearing set for July 7. Attempts at enforcement before the writs were served consisted in keeping the vehicles moving in the streets instead of permitting them to stand at their regular loading stations.

The Corporation Counsel's office gave out an opinion that the Circuit Court had no jurisdiction in the case as the validity of the ordinance had been upheld by the Supreme Court. A hearing

was requested within 24 hours, and despite the contention of the Corporation Counsel that the injunction was invalid, Mayor Smith declared that the city would observe the terms of the injunction until such time as it was dissolved.

Legal skirmishes followed in quick succession on July 2, but at the end of the day the jitneys were still running. The Supreme Court handed down a ruling upholding the validity of the ordinance and refused to grant a rehearing of the case as asked by attorneys for the jitney drivers.

In the forenoon of July 2 Judge Murphy dissolved the injunction granted by Judge Harry Dingeman which restrained the city from enforcing the ordinance, and in the afternoon of the same day he granted a temporary restraining order forbidding the police, Mayor Smith and the Sheriff's office from interfering with jitney operations. This later action by Judge Murphy was taken on a "taxpayer's suit" and granted a reprieve until July 7. A public hearing was held by the Council on July 6.

Subway Motormen of Interborough, New York, Strike

Operators and Switchmen Secede from Brotherhood Organization—Contract with Other Men Renewed Recently—Full Statements of Company's Position

Strikers Ask \$1 Hour

MOTORMEN for the Interborough receive from 69 to 82 cents an hour, depending on length of service. The scale for the first year is \$38.64 a week and \$45.92 after six years' service.

Switchmen at present receive from 58 to 61 cents. Their average weekly earnings for the first year are \$32.48. In the third year they receive \$34.16.

The strikers demand \$1 an hour for motormen and 75 cents for switchmen. They and the other Interborough employees work seven days in the week.

NEWSPAPER accounts of the strike of the motormen and switchmen of the Interborough Rapid Transit Company, New York, declared effective at midnight on July 5, make the situation appear much worse than it really is. Service is inadequate, it is true, but the lines are being operated with a degree of skill that is unusual considering the defections from the ranks of the men. These defections totaled

about half the force of workers on the subway division, with a scattering of men from the elevated lines. The company has the situation well in hand, and is gradually building up its personnel to the required quota.

But it is the issues involved that are of real interest. Officials of the Brotherhood of Interborough Rapid Transit Company Employees and of the company signed an agreement on June 30 continuing for a year the wage scale agreement which expired at midnight on June 30. The new agreement covers all 28 locals of the brotherhood. The action was taken at an executive conference attended by 62 representatives of the union and three I.R.T. officials. M. J. Mangan, secretary of the brotherhood, and Frank Hedley, president and general manager of the I.R.T., made the announcement. Prior to the meeting, the majority of the locals were prepared to renew the old agreement, but those representing the motormen and switchmen held out for a wage increase.

There had been rumors before of possible dissension among the motormen and switchmen, but this was the first real indication that the situation might get beyond the point of possible settlement by mediation between the two parties. On July 2 there followed



A Scene During the Subway Strike with New York Policemen Waiting in a Subway Coach at Van Cortlandt Park Station to Go with Strike-Breaking Motormen

an ultimatum that unless their demands were met by 6 o'clock that night, at least 579 motormen and switchmen out of a total of 752 employed on the subway lines would cease work at a minute after midnight Tuesday morning. To the still loyal members of the brotherhood Frank Hedley, president of the Interborough, explained that power never had been vested in the subway motormen and switchmen's union to reject or refuse to be bound by the action of the general committee of the brotherhood. Because he believed the subway motormen and switchmen were being made tools of by a few ambitious men among them desirous of promoting their own ends, he said he was going to give them a reasonable opportunity for second thought. If they persisted in withdrawing from the brotherhood and joined this "outlaw organization," he said, "it will be necessary for me to terminate their employment."

So serious had the prospects now become that the Transit Commission held conferences on Sunday with representatives of both the railway and the motormen. The representatives of the motormen called first. They were Edward P. Lavin, Harry Bark and Joseph Phelan. The delegation informed the commission that they had decided to accept the commission's offer to arbitrate the wage question. Mr. Hedley and James L. Quackenbush, general counsel of the railway, were received by the commission immediately after its conference with the motormen's representatives. Each conference occupied close to one hour, and upon the retirement of the Interborough company's representatives Chairman John F. Gilchrist and his colleagues announced that the commission had made to the representatives of the company the same offer it had made to the representatives of the motormen, namely, to act as arbitrators of the wage dispute, if acceptable to both sides. The Interbor-

ough company's representative stated, that by reason of their agreement with the Brotherhood of Interborough Employees, the officers of the company could not act without consulting the general committee which had been called to meet at 10 a.m. the following day. They therefore asked that they be allowed until noon that day to give their answer. The representatives of the motormen and switchmen agreed to this.

Mr. Hedley took the stand he did because the contract between the Inter-

borough and the Brotherhood of Interborough Employees provides that all matters of dispute must be submitted to arbitration, to be conducted on behalf of the brotherhood by its general committee, which shall name one arbitrator, the company the other, and in the event that the two fail to agree upon the third, the third shall be selected by a justice of the Supreme Court. He pointed out that he had been urged to stand by the brotherhood and that he had assured the organization he would do so. He said that to consent to treat with the seceders even indirectly through the commission might be regarded by the brotherhood as a breach of contract with that body.

On the morning of July 5 a meeting of the general committee of the brotherhood was held. All of the 62 delegates were present except Messrs. Lavin, Bark and Phelan, representatives of the subway motormen and switchmen. The unanimous opinion of the general committee of the brotherhood, which represents all employees except the subway motormen and switchmen, was that for Mr. Hedley to consent to arbitrate any matter with any group of men who have left the brotherhood would be regarded by the general committee as a breach of faith by him as well as a violation of the contract between the company and the brotherhood.

In consequence Mr. Hedley informed the commission that he was unable to see how he could adopt the suggestion of the commission. He was sure that to do so would jeopardize the public interest in a deplorable manner. He said that any conduct of his which led the loyal members of the brotherhood to believe that they had been betrayed and that their organization was about to be disrupted might result in provoking some 12,000 or 13,000 men to leave the service.



Strike Breakers Quartered in Car Shop to Be Available for Duty

While he was powerless in the circumstances to accept arbitration with the seceders, he requested the transit commission to exercise its powers under the statute and to institute on its own motion a public hearing to find and report to the public all of the facts bearing in any way upon the causes which have led to the existing situation. He felt that a request from the commission to dissatisfied subway motormen and switchmen to continue in the service until the commission had concluded its investigation and reported its conclusions to the public, would insure the continuance of service.

In conclusion Mr. Hedley said that while he desired tranquillity, if he must make a choice, he preferred to face a strike of a few hundred motormen rather than to face a strike which would involve practically the entire force of the company included in the brotherhood.

In view of Mr. Hedley's statement there was no mistaking the company's stand. The situation was up to the representatives of the men who had seceded from the brotherhood. In an effort to make good their boasts they called out such men as they had succeeded in enticing into the new organization, which they termed the Consolidated Railroad Workers.

All the other transportation agencies were quick to come to the aid of the public. In response to a call issued by the Transit Commission, a conference was held in the commission's office on July 2, attended by the operating heads of all the large transportation systems, (except the Interborough Company) and Commissioner Albert Goldman of the Department of Plant and Structures, which has supervision of the municipal bus lines. The entire Transit Commission participated.

Chairman Gilchrist told the conferees that there was a possibility of a strike upon the Interborough Rapid Transit system, and that, a stoppage or curtailment of its service would work great hardship upon the people of New York; and that he had called them together for the purpose of taking precautionary measures.

All of the conferees pledged their co-operation and promised to do all that is possible in the way of providing additional service. It was also suggested that some of the trolley lines which intersect, arrange to exchange facilities, so that the cars of one company may operate temporarily over the tracks of another. Each company also agreed to supply extra cars, both by drawing upon their reserve, and by transferring from crosstown lines to longitudinal lines.

Commissioner Goldman of the Department of Plant and Structures stated that his department would be able to supply from 100 to 150 extra buses, which would be placed on streets where they would be most needed.

At the conclusion of the conference each company was requested to submit to the commission a typewritten statement showing the extent of the extra service to be provided and such changes in operation as it will be necessary to impart to the public, so as to minimize the confusion which may arise from a change in the daily routine. As soon

as this statement was received and tabulated, the commission prepared a statement for the information and guidance of the public.

The following reports show that other transportation agencies have carried considerably more than normal traffic:

Company	Passengers Carried in Excess of Total of July 7, 1925
B. M. T. subway and elevated lines	439,420
Third Ave. surface lines.....	239,012
B. M. T. surface lines.....	141,940
Fifth Avenue Coach.....	108,817
Brooklyn City Railroad.....	77,060
New York Railways.....	40,480
Ninth Ave. surface line.....	40,160
Fourth Ave. surface line.....	31,520
Eighth Ave. surface line.....	15,600
New York Central.....	15,000
Total.....	1,112,989

The real picture of the accomplishments of the company is best told by the record of service which it has been able to give and by the figures of defection from the ranks and the number of new men trained to fill the strikers'

places. Despite the effort to involve the elevated road in the walkout, service on the elevated lines has been practically normal at all times. Subway service, suffered the first day, for only 30 to 50 per cent of normal service was given. On Wednesday service was about 70 per cent normal and on Thursday the percentage had been increased to 77 per cent normal. The regular number of men employed as motormen and switchmen is 752. Of these more than 700 were induced to go out the first day. Former motormen to the number of 113 and former switchmen to the number of eighteen returned to the service by Wednesday night. Up to Thursday 1,081 men had been examined, of whom 77 were rejected for physical reasons and 276 because of their inability to qualify. By Thursday night the company had available through its intensive system of employment and selection 610 motormen and 249 switchmen, or more than 100 in excess of the normal requirements.

Strike On in Indianapolis

Amalgamated Men, Small Part of Entire Force, Walked Out on July 5—
Service 75 Per Cent Efficient—People Little Inconvenienced

Fewer than 40 per cent of the 1,400 motormen and conductors of the Indianapolis Street Railway, Indianapolis, Ind., went on strike July 5 as the result of a meeting of employees affiliated with the Amalgamated Association. Among other things the men demand reinstatement of between 65 and 70 employees alleged to have been discharged for union activities, recognition of the union, a substantial increase in wages, the amount to be left to an arbitration board, the arbitration of all questions on which the company and union cannot agree, and improvement of working conditions.

A résumé of the traffic situation during the first few days of the strike shows the company operating about 75 per cent normal. On no lines are the cars tied up. The buses are maintaining virtually perfect schedules. The general public does not seem particularly concerned about the strike.

During the past three or four years the Indianapolis Street Railway has escaped censure because it has laid its problems fully before the public and it is generally known the company is not making any money and that its rate demands have been very moderate.

Late on July 6 officials of the company notified the men that all strikers would be restored to their usual jobs if they reported for work not later than 6 p.m. on July 7. The sudden action of the company, coupled with the short time given for reporting, indicates that officials believe they have the situation well in hand and will be able to resume regular schedules without the aid of the strikers.

John M. Parker and Robert Armstrong, international vice-presidents of the Amalgamated, who have been in Indianapolis for several weeks organizing the union, made brief talks at the meeting at which the question of going out on strike was proposed, but they left before the strike vote was taken.

On behalf of the company its officials

on July 6 requested that contempt proceedings be brought against certain employees and officials of the union. Deputies in the District Attorney's office said they were investigating the situation and would bring proceedings if the evidence warranted action. The announcement was made after Alexander G. Cavins, Assistant District Attorney, had consulted with C. W. McPhall, head of the Department of Justice in the Indiana federal district, and after he had conferred with attorneys for the railway.

Officials of the Indianapolis police force have increased the working hours of patrolmen from eight to twelve hours, giving the department a third more men at all times. Emergency squads, heavily armed, are held in reserve at headquarters, ready to be dispatched to the scene of any trouble.

The public is suffering little inconvenience because of the strike of motormen and conductors. At morning and evening rush hours the strike is apparent, but at other intervals during the day and night little difference is noticed. Officials of the company say that 75 men returned to work before the dead-line on July 7, after which the strikers lost their seniority rights. In addition the company has hired 240 new men who have had experience before in car operation, and as soon as they have been amalgamated into active service it is thought cars will be operated with no interruption at all.

It was said by Albert Ward, United States District Attorney, that no action would be taken immediately toward citing for contempt of court some of the leaders in the strike movement for alleged violation of the injunction order issued July 3 by Judge Robert C. Baltzell. Mr. Ward said he was awaiting a report from the Department of Justice before taking action. Up to the present time law violations have been few. Police appear to be vigilant and special details are held at substations.

Philadelphia-Camden Bridge Opened

The great suspension bridge linking Philadelphia and Camden, across the Delaware River, was opened on July 1. The bridge is 1.82 miles long, while its main span alone is 1,750 ft. The main roadway of the bridge can accommodate three lines of traffic in each direction, while paralleling it tracks are reserved for trolley lines and high-speed inter-urban electric trains running to South Jersey towns. An upper level is provided for pedestrians.

With the opening of the bridge Philadelphia and Camden were linked for the first time by a through transportation service. Buses are run from Kaighn's Point ferry of the Philadelphia & Reading Railway, in Camden, to the Camden bridge plaza. Crossing the bridge, the route divides, buses proceeding west by way of Vine Street, Twenty-second and Race, returning over Race Street, and others by way of Eighth Street and Market to and around City Hall, returning over Market and Seventh to the bridge, thence to the Kaighn Avenue ferry.

The buses that operate over Market Street carry only interstate passengers. Stops are made at each street intersection to discharge passengers on the westbound trip and to receive passengers only on the eastbound trip. The fare is 10 cents.

Buses are also operated from plaza to plaza over the bridge at a 5-cent fare. The Philadelphia Rapid Transit Company and the Public Service Railway of New Jersey, which are co-operating in supplying the present service, are studying the desirability of P.R.T. now furnishing a street car service from Camden center city to the Philadelphia plaza station for a 7½-cent P.R.T. fare, pending the building of the proposed Chestnut Street surface car subway connecting with the new line.

The Delaware Bridge Joint Commission, with representatives of New Jersey and Pennsylvania, was created in 1919, and in 1920 Ralph Modjeski, chief designer of the bridge, began his plans. Congress and the War Department approved the project, and construction work began on the Philadelphia side on Jan. 6, 1922.

7-Cent Fares to Continue in Rye and Port Chester

The Public Service Commission of New York under an order issued on June 30 authorized the New York & Stamford Railway, effective on July 1, to continue the present 7-cent fare in Rye and Port Chester until Nov. 1, 1926, unless otherwise ordered and a 5-cent fare in zone 1 between Mechanic Street in New Rochelle and the Harrison-Rye dividing line.

Evidence showed that in 1925 there was a deficit of \$3,367 and an estimated deficit in 1926, based on five months operation, of \$78,900 based on the fares fixed in May 1925. The company further estimated a deficit with the 5-cent fare in zone 1 for 1926 of \$146,267. A 7-cent fare prevails on the company's lines in Connecticut.

It is difficult to see how, in the face

of such operating results and estimates, the commission holds, the company can continue to carry on its operations very long. It appears, however, that it does not expect to do so because the company finds that several months must elapse before bus lines can be started and that public interest demands operation of the lines until the establishment of the bus system.

No doubt the cessation of the railway service at the present time, the commission holds, would be prejudicial to the public interest, and in view of the actual operating results the commission is justified in continuing the present 7-cent fares in the zones within Rye and Port Chester.

Agreement Reached in Tacoma

Terms Announced Under Which Company There Will Operate for Temporary Period

Just 23 days after the new administration of the city of Tacoma, Wash., came into office a definite agreement was reached with the Tacoma Railway & Power Company, providing for at least a temporary settlement of the transportation problem during a test period of from six months to one year. The agreement was reached without any evidence of the bickering and re-criminating that have marked the past eight years attempt to come to an agreement, and Mayor Melvin G. Tennant is being congratulated by Tacoma citizens for his fair-minded attitude toward the railway. The company was represented by Richard T. Sullivan, manager; Frank D. Oakley, attorney; C. S. Reynolds, public relations superintendent, and E. Conover, statistician.

Under the proposed test plan, cash fares will drop from 10 cents to 8 cents. Street car tokens will be sold at the rate of fifteen for \$1 at agencies throughout the city. Tokens heretofore have been 8½ cents. The weekly pass plan will be eliminated. This will mean an increase of fare for certain users, but for others it is expected that the rate of fifteen tokens for \$1 will figure out at no higher fare per ride. Traction officials figure there are about 500 out of the present 5,000 to 6,000 pass users who are "professionals," in that they use their passes many times every week. It is said this class is now getting service at less than cost, at the expense of other riders.

Transfers, exchangeable between the private line and the municipal belt line, will accompany the cash or token fares. This will mean a saving for the tideflats worker, who has been forced to pay the usual fare on the private lines and 5 cents more on the tideflats line.

Opportunity is reserved to revise the fare bases during the period of the test. This revision might be up or down, as the result of the test dictates. If at the end of a two-months period it is demonstrated that the fares are beyond hope of producing revenue sufficient to cover the cost of operation, maintenance and fixed charges and leave an annual sum of \$270,000, which the city officials have agreed is reasonable to be devoted to depreciation and return on investment, it is proposed that the

fares be changed in a trial to produce more revenue. On the other hand, if the earnings appear to warrant it a lower fare may be tried.

Under the proposed plan representatives of the city and company will meet once a week to go over figures of the week's business and consider means of increasing efficiency, service and returns, or of reducing costs.

Competing buses will be eliminated under the proposed operation. Buses will be used by the railway only where extensions of service are needed. Three such extensions have been agreed upon.

Wages Advanced in Peoria

After negotiations which have been going on since May 1, Arbitrators Henry Mansfield for the men and E. E. Soules for the Illinois Power & Light Corporation, Peoria, Ill., have reached an agreement in adjusting the wages of the railway and bus employees. Their finding gives all platform men, motor coach, carhouse and shop men an advance of 2½ cents an hour. The award is retroactive to May 1. It will be binding until April 30, 1927. The new rates for trainmen are 48½ cents an hour for the first year, 50½ cents an hour for the second year and 52½ cents an hour thereafter. One-man car operators will receive 5 cents an hour extra. The company operates practically all one-man cars. The new rates for the bus men are 53½ cents an hour for the first year, 55½ cents an hour for the second year and 57½ cents an hour for the third year and thereafter.

Hearings on Fare Petitions Scheduled

Hearings on the petition of the New York State Railways for a higher fare rate in Rome and Oneida will be held before the Public Service Commission at Albany on July 12. In Rome and in Oneida a new maximum rate of fare of at least three tickets for 25 cents and a cash fare of 10 cents are sought in place of the 7-cent fare which has been in existence in Rome since May 25, 1920, and in Oneida since Feb. 7, 1923.

Extra Suits and Valets, Too, in Pittsburgh

Employees of the Pittsburgh Railways, Pittsburgh, Pa., have fallen upon delectable days. Trainmen will hereafter have the choice of two suits of clothes to pick from in lieu of the traditional one and will have the attention of valets to repair linings, replace buttons and clean and press trousers. This metamorphosis came about through an announcement by the company that nine tailor shops with expert tailors in charge had been opened at the company administration building. The new suits will adhere to the present mode of blue serge with pockets and will be topped with the traditional caps on which numbers will be stamped. This action of the company in permitting its employees to a choice of garment is regarded, so one criterion avers, as the first move in a campaign to have the Pittsburgh Railways men set the fashions of the smoky city.

Transportation Committee for Cincinnati

Representatives of the Cincinnati Street Railway and the major bus lines of Cincinnati, Ohio, have organized the "Greater Cincinnati Transportation Committee" to settle all difficulties and problems of transportation arising between electric railway and bus lines. The committee comprises Walter A. Draper, president of the Cincinnati Street Railway; Edwin Becker, representing the Cincinnati Motor Bus Company; Thomas L. Tal-lentire, president of the City Transit, Inc., and C. McCreight, president of the Blue Bus Company. Edgar Dow Gilman, director of street cars and motor buses of Cincinnati, and W. J. Wiggeringloh, safety director of Norwood, Ohio, are ex officio members. The committee has decided to meet at intervals to discuss transportation matters.

Arbitration Board in Montreal Negotiates on Wages

An arbitration board is hearing the wage dispute between the Montreal & Southern Counties Railway, Montreal, Canada, and its motormen and conductors. The men have petitioned for an increase of from 5 cents to 7 cents a day and for a basic nine-hour day. Bernard Rose, K. C., is chairman of the board. At a recent meeting A. E. Crilley, chief of wage bureau of the Canadian National Railways, held that the cost of living had increased 49 per cent since 1914 and rates of pay had jumped 108 per cent on the interurban lines and 100 per cent on the suburban lines; that to accede to the men's demands would add \$34,000 annually to operating costs. W. J. Babe, vice-president of the Brotherhood of Railroad Trainmen, questioned the cost of the raise as claimed by Mr. Crilley. Members of the board hearing the dispute traveled over sections of the road recently on an inspection tour to gain first-hand knowledge of the manner in which operations are conducted. The Montreal & Southern Counties Railway operates 29 miles of line.

Provisions of Hamilton Agree- ment Outlined

In accordance with the new agreement entered into recently between Hamilton, Ont., and the Hamilton Street Railway, the company undertakes to improve its service by the expenditure of about \$1,250,000 during the next three years for new cars, buses and carhouses. The vote of the electors approving the contract was referred to in the ELECTRIC RAILWAY JOURNAL, issue of May 15, page 859. This public decision terminated a period of dissension which started in December last year following the defeat of two railway by-laws, one providing for the city's purchasing the system and the other for granting to the Hamilton Street Railway a 25-year franchise. At that time negotiations resulted in a continuation of the service pending the completion of a new contract.

The essential points of the new agree-

ment provide that the fares shall be just and reasonable; that for the next two years the present 5-cent fare shall remain in force; that the company is to have the exclusive privilege of carrying people by any means except cabs and taxicabs; that the existing jitney licenses shall be issued and no transfers of licenses allowed; that after the expiration of two years no jitney licenses will be renewed. Other features of the agreement refer to the financial obligations assumed by the company in relationship to the city. In the past the city collected about \$100,000 a year for mileage and percentage. These charges are dropped. The cost of snow removal used to be divided equally between the city and the company. According to the new agreement the city will bear 60 per cent of the cost and the company 40 per cent. The company will also be permitted to run one-man cars and to carry advertising on the outside of the cars. Both of these were formerly forbidden.

News Notes

Six-Cent Fare Continued.—The Transit Commission has authorized the New York & Queens County Railway, operating between Corona and College Point and between Flushing and Jamaica, in Queens, N. Y., to continue its 6-cent fare for another year. The increase from 5 cents to 6 cents was ordered by the Supreme Court in Long Island City in 1924, when Lincoln C. Andrews, receiver of the company, asked that 1 cent be added to the fare for every \$100,000 spent by the company for paving between its tracks.

Wage Contract Renewed.—The contract between the Shreveport Railways, Shreveport, La., and its employees, which was in force prior to July 1, 1926, has been continued for another year, without modification.

One-Man Cars Will Be Tried.—One-man cars will be placed in service in Memphis, Tenn., within the next few weeks by the Memphis Street Railway to effect a saving in operation of costs to be applied to better service. Collectors of fares will be placed on the ground at busy corners downtown.

Increased Fares in Hannibal.—The Hannibal Railway & Electric Company, Hannibal, Mo., has been granted permission by the Missouri Public Service Commission to increase its fares to 8 cents for adults and 4 cents for children. Tokens are two for 15 cents and children's tokens 3½ cents apiece. These rates are a 2-cent increase for adults and a 1-cent increase for children over the former rates. The new rate is expected to show a return of 10.7 per cent for depreciation and profit. The commission fixed the value of the property at \$219,711.

Increased Tariffs on Special Tickets Sought.—The Chicago, Aurora & Elgin Railroad, Aurora, Ill., has filed a petition with the Illinois Commerce Commission asking for authority to raise its tariffs 20 per cent on its monthly

commutation tickets, ten and 25-ride coupons and special one-day limit tickets. No increase is sought for regular fares and school children's fares. If the increase is granted it will be effective July 15. President Budd asserted that the return is not sufficient to provide for necessary development and that existing rates are lower than the rates of other competitive lines. He stated that the actual return to the entire property was only 3.54 per cent last year. On June 15 the company filed a petition with the commission in which permission was asked to increase passenger rates 15 per cent.

Fare Case Postponed.—The hearing scheduled for July 6 on the petition of the United Traction Company, Albany, N. Y., for increased fares in various municipalities served by it has been postponed until July 27.

Token Carriers Free in Akron.—The Northern Ohio Power & Light Company, Akron, Ohio, is giving free to its car riders for the time being a nickel carfare token carrier easily carried in the pocket. It will serve as a preventive against the loss of metal tokens and will help speed up service. Patrons are instructed to hand the conductor a quarter and say, "Four checks and a carrier."

Choice Between Bus and Railway Service.—A more flexible development in transportation service has been started by the Wisconsin Power & Light Company on its intercity line connecting Fond du Lac, Oshkosh and Neenah. Under this new plan patrons will have the choice of electric railway or bus service. Effective July 1, alternate hourly service is offered, with interurbans leaving the terminal on odd hours and buses on the even hours. The fares for each service will remain the same, with interchangeable commutation tickets.

President's Office Changed.—The address of the president of the Southwestern Public Service Association has been changed from Mineral Wells, Tex., to Dallas, Tex. The office is held by Harold E. Borton, whose election to the presidency was referred to recently in the ELECTRIC RAILWAY JOURNAL.

East St. Louis Track Case Under Advisement.—Judge Lindley in the federal court of Danville, Ill., on June 25 heard arguments on the application for a permanent injunction to restrain the city of East St. Louis from tearing up the tracks of the East St. Louis Railway on Third Street. The case was taken under advisement by the court. The question of whether the Public Utilities Commission or the municipalities shall control local public utilities is of state-wide interest. In Chicago, a similar question will likely arise with the expiration of the surface car franchises. That city was represented at the East St. Louis hearing.

New Line Completed in St. Petersburg.—The Shore Acres extension of the Masonic Home street car line became a part of the Municipal Railway of St. Petersburg, St. Petersburg, Fla., on July 1 when a deed to the development was turned over to city officials by heads of the Shore Acres and Snell Isle development companies. Dedic-

tion ceremonies were held at the end of the line in Shore Acres Center. This extension of 3 miles is the longest addition to the system since the car line was run out West Central in 1913. It cost the developers approximately \$90,000 and was turned over to the city free of any encumbrance.

Wage Scales Continued.—A new working agreement has been made between employees on the old Northwestern Ohio Electric line connecting Toledo, Oak Harbor and Port Clinton and the Ohio Public Service Corporation, present owner. The contract provides for continuing the wage scales, which average about 57 cents an hour, but permits employees to reach the maximum scale at the end of one year instead of three years. The agreement expires in November.

Wage Board Holds Hearing.—An arbitration board selected to hear testimony of the East St. Louis & Suburban Railway, the Alton, Granite & St. Louis Traction Company and their employees regarding the adequacy of the present wages paid to carmen and other workers held its first hearing in East St. Louis, Ill., June 28. The board consists of five members. B. F. Thomas and C. E. Smith represent the company, W. L. Perry local union No. 805 and J. L. McMurdo local union No. 125, while Frank Slater, an attorney of St. Louis, Mo., is chairman and neutral member of the board. The carmen are affiliated with the Amalgamated.

Injunction Petition Dismissed.—Judge Henry C. McDowell, in the Federal District Court at Lynchburg, Va., has dismissed the petition of the Lynchburg Traction & Light Company against the city of Lynchburg for a permanent injunction to restrain the city from enforcing its ordinance for a 5-cent fare in the parts of the city annexed from Campbell County on Jan. 1, of this year. The court held that it had no jurisdiction and that the ordinance was not repugnant to the Constitution of the United States. The case was dismissed without prejudice to the complainant company.

Railway-Bus Between Milwaukee and Madison.—Co-ordinated railway and bus service between Milwaukee and Madison will be offered by the Milwaukee Electric Railway & Light Company commencing on July 8, which will result in faster and more frequent service. Through bus service over Highway 19 between these cities will be discontinued. Under the new feeder arrangement buses from Madison will connect at Watertown with the company's newly completed rapid transit line, which has cut the running time between Milwaukee and Watertown to three hours. Patrons wishing to travel via bus between these two cities will be provided with through bus service over Highway 41 hereafter.

Would Abandon Two Lines.—Application has been made to the Dover and New Philadelphia City Councils by the Northern Ohio Power & Light Company to abandon what is known as the "New Line" between the two cities. The distance is a little more than 3 miles. The company will offer bus service for the remainder of the franchise, or for two years.

Recent Bus Developments

Further Expansion of Akron Bus Service

The twenty 29-passenger, modern six-wheel buses now being built for the Akron express lines of the Northern Ohio Power & Light Company are expected to begin to arrive July 10 from the Kuhlman Car Company, which is building the bodies. Chassis are the product of the Six-Wheel Company, Philadelphia. They are single-deck buses.

At the same time six other six-wheel buses of the 27-passenger type will be delivered for use in Canton. The Canton buses are also modern to the minute. They will be used on the Sixth Street, Prospect, Ninth Street and Maryland Avenue lines. They will probably be in service by July 15.

The Akron Market Street express line will be started July 15. It will operate across town. It is hoped at the same time to extend the Main Street-Cuyahoga Falls express line to Firestone Park over South Main Street for convenience of patrons in that section.

Details of operation are now being worked out and stops provided.

Engines used in these buses are of a six-cylinder type. They will provide a high-class service between East Akron and West Hill at a 10-cent fare.

International May Operate Buffalo Taxis

Negotiations are reported to be under way by the International Bus Corporation, Buffalo, a subsidiary of the International Railway, for a merger of two taxi lines in Buffalo with the bus company. The taxi lines involved in the negotiations are the Yellow Cab Company and the Van Dyke Taxi & Transfer Company. These are the two largest taxicab companies operating in Buffalo and the plan under consideration is reported to be somewhat similar to the merger of transportation lines in Philadelphia by Mitten Management, Inc.

Council Postpones Abandonment —Bus Plan in Davenport

The City Council of Davenport, Iowa, has postponed action on the application of the Tri-City Railway to abandon a portion of its trackage, to reroute the Fejervary Park and Le Claire Street and Oakdale line and to begin the operation of buses on a portion of its system here. Approval of the application was expected at an adjourned meeting of the Council on June 22, but minor changes were asked in the resolution indorsing the application and final action was held over until the next Council meeting, set for July 7.

It is also rumored that a majority in favor of the application was lacking at the last meeting and that postponement of the vote was taken partly for this reason. Specifications on eventual

replacement of paving on streets where car lines are to be abandoned is said to have been one of the points on which a difference of opinion developed in the Council.

Four-Mile Line in Operation in Chicago Suburbs

Operation of buses on Roosevelt Road between Ninth Avenue in Maywood, Ill., and Seventeenth Avenue in Broadview, Ill., has been begun by the Chicago & West Towns Railway. The new route is an extension of the company's old Roosevelt Road line in Maywood. It is 4.1 miles in length. In accordance with the terms of the certificate granted by the Illinois Commerce Commission on June 17, two buses have been placed in this service.

New Terminal Opened in Baltimore

With Gov. Albert C. Ritchie of Maryland and Mayor Howard W. Jackson of Baltimore taking part in the ceremonies, the Union Bus Terminal Company opened its union terminal at Redwood and Liberty Streets, Baltimore, on June 30. The building is a handsome two-story structure with ample room for all departments and for the convenience of the public. July 1 brought about the actual placing in service of the new terminal. At that time six important bus lines that have been starting from various points in the city began operations from the new station. It is expected that others will make it their headquarters soon.

The companies that are using the terminal are the Washington Motor Coach Company, which operates buses every hour between Baltimore and Washington; the Furlin Shore Lines, making the terminal its only stop in Baltimore in connection with its Baltimore-Atlantic City service; the Palace Coach Line, Inc., operating between Washington and New York; the Conoway Motor Company, maintaining service between Baltimore and Westminster, Taneytown and Emmitsburg, Md.; the People's Rapid Transit Company, operating from Baltimore to Washington, Philadelphia, New York and Atlantic City, and the Red Star Lines, maintaining service from Baltimore to York, Harrisburg and Philadelphia. Among the owners of lines operated from the terminal are Day & Zimmermann and the Philadelphia Rapid Transit Company.

Not Permitted to Operate Until September.—The Public Service Commission extended on June 29 the time in which Wilbur P. Menke, operator of buses in Philadelphia and Montgomery Counties, can operate his cars from June 1 to Aug. 31. On the latter date all rights and privileges granted to him by the commission will cease, and the Philadelphia Rural Transit Company,

subsidiary of the Philadelphia Rapid Transit Company, will furnish the bus service.

Would Run Line of Three Miles.—The Bus Transportation Company, a subsidiary of the Denver Tramway, Denver, Col., which lost out in the May, 1925, election when it sought to operate buses as feeders to the railway, has asked the Public Utilities Commission for permission to operate buses from the end of the car line at Aurora to the Fitzsimmons Hospital, a distance of about 3 miles. There have never been any street cars beyond Aurora. The plea has been docketed.

Buses in Prospect.—The Scranton Railway, Scranton, Pa., recently received permission from the Public Service Commission to abandon its 7,100 ft. of track from the New York, Susquehanna & Western Railroad crossing in the Borough of Old Forge to the Luzerne County line. This branch will be out of service by July 11. The Wyoming Bus Company, a subsidiary of the Wilkes-Barre Railway and the Glen Bus Company, have applied to the Public Service Commission for certificates of public convenience for the operation of buses over this territory.

Opposes Bus Line.—The Milwaukee Electric Railway & Light Company has expressed its opposition to the application of the American Coach Lines, Inc., which plans to provide service between the east side and downtown sections of Milwaukee, Wis. The American Coach Lines, Inc., now operates the Green Bay-Milwaukee intercity bus line. Action on the application has been laid over by the Council in order to give property owners and business men an opportunity to express their views on the necessity of the new line. The railway, which supplies service over the routes proposed, contends it has prior rights to these streets; that they are at present already overcrowded with traffic, and that to permit another bus line in the downtown section would be unfair to the public and merchants.

Route Extension Denied.—A petition by the Gary Railways for an extension of its bus routes in East Chicago, Ind., was denied by the Indiana Public Service Commission. That body held that the territory for which the petition was written is already amply provided with bus service.

Would Operate Buses Instead of Cars.—The United Light & Power Company has asked the Nebraska Railway Commission for authority to begin substitution of buses for street cars in the city of Lincoln. In this city the company recently purchased all of the stock of the Lincoln Traction Company. Outlying lines to the state penitentiary and state hospital have been selected for abandonment first.

Bus Substitution in Prospect.—The Olean, Bradford & Salamanca Railway, Olean, N. Y., has announced that it will replace one of the interurban cars on the Olean-Bradford line with a bus. Abandonment of the interurban line between Portville and Bolivar is planned by the railway and a hearing on the company's application will be held by the Public Service Commission. If the interurban route is abandoned, the

railway will substitute bus service between Portville and Bolivar. The company recently abandoned its electric line between Salamanca and Little Valley and is now operating buses there.

Opposes Bus Certificate.—The Worcester Consolidated Street Railway, Worcester, Mass., at a recent hearing before the Massachusetts Department of Public Utilities, opposed the granting of a permanent certificate of public convenience and necessity to the Carlstrom Bus Lines for three sections of the present route of the lines between Worcester and Marlboro and between Westboro and Hopkinton. Competition with the street railway was the basis for the opposition.

Buses to Be Installed.—The City Council of Alexandria, La., has been authorized to abandon the Municipal Street Railway and to install buses. It was also granted the privilege of giving a franchise to a private concern to operate buses. The Municipal Street Railway of Alexandria operates 7 miles. It was purchased by the city from the Southern Traction & Power Company.

New Bus Line in Toledo Planned.—Electric railway service on Front Street, Toledo, Ohio, is rapidly being replaced by bus service, according to a statement in the May report of the Community Traction Company. It is said that the entire line will be equipped to operate with new buses on Aug. 1.

Bus Service May Follow Abandonment.—The Indianapolis Street Railway, Indianapolis, Ind., has received authority from the Public Service Commission to abandon its railway service in Pershing Avenue. This consists of a one-car feeder service between Tenth Street and Emrichsville. At the insistence of Frank Wampler, commissioner, the commission stipulated that the service shall not be abandoned until the construction work on improving the street actually is begun by the city. After the street car service is abandoned the commission will require the company to provide bus feeder service at the rush hours.

Tulsa-Oklahoma City Bus Line Proposed.—Bus service between Tulsa and Oklahoma City, Okla., is proposed in an application submitted to the Corporation Commission by the Union Transportation Company of Tulsa. This company is under the same management as the Oklahoma Union Railway. If the Corporation Commission grants the application the fare will be the same as the railroad chair car rate and the time four hours and 35 minutes. The route will pass through Kellyville, Bristow, Stroud, Chandler, Meeker and Choctaw.

Bus Line Between Syracuse and Auburn.—The Public Service Commission on June 18 granted permission to the Mid-State Coach Lines, Inc., bus subsidiary of the Auburn & Syracuse Electric Railroad, to operate a bus line between the city of Syracuse and the city of Auburn, N. Y. The route will start at the interurban trolley station in Syracuse and will proceed over the Genesee Turnpike to the city line of Auburn, and thence to the trolley terminal on State Street in that city. The total distance traveled will be approxi-

mately 25 miles. Consents to the operation of the proposed line have been granted by the cities of Syracuse and Auburn and by the various towns and villages along the line. Five round trips will be operated daily and the through fare will be \$1. It is proposed to use modern suburban buses. The Mid-State Coach Lines, Inc., now operates bus lines in the city of Auburn and in the city of Oswego.

Will Cover Former Railway Ground.—The Public Service Commission granted a certificate recently to the Schenck Transportation Company, Inc., to operate a bus line between Mineola and the Nassau-Queens county line, serving Mineola, Floral Park, Bellerose and parts of the towns of Hempstead and North Hempstead. The bus line will give service in territory formerly served by the New York & Long Island Traction Company.

Partial Bus Service Planned in Ottumwa.—The City Council of Ottumwa, Iowa, passed a resolution recently specifying the abandonment of railway service on the Court Hill line and the substitution of bus service. It is proposed to charge the Iowa Southern Utilities Company, successor to the Ottumwa Traction Company, a license fee of \$25 a year for each bus. The company will buy three new buses for the line. The same schedule and fare will be kept.

Temporary Service in Colorado.—The Colorado Springs & Interurban Railway has been authorized by the Public Utilities Commission to operate buses between Colorado Springs and Manitou from June 15 to Oct. 1, every year. The distance is about 3 miles. It also covers the route by electric railway.

From Philadelphia to Niagara by Bus.—The Philadelphia Rapid Transit Company recently announced the starting of a new bus service between Philadelphia, Pa., and Niagara Falls, N. Y., with the first tour on July 3. The trip will occupy two days each way, with stop-over privileges in Buffalo. The northbound route will follow the Lackawanna Trail, through the Delaware Water Gap and the Pocono Mountains, with a stop the first night at Binghamton, N. Y. The return trip will be made over the Susquehanna Trail, with Williamsport, Pa., as the stopping place. Buses leave Philadelphia every Wednesday and Saturday and Buffalo every Tuesday and Saturday.

New Bus Service Installed.—A new city bus line extending into the northwest section of Sheboygan, Wis., has been placed in service by the Wisconsin Power & Light Company in response to a petition presented to the Common Council. The service will be provided under a temporary arrangement by which the line may be discontinued if patronage should prove unsatisfactory. The company recently established bus service to the southwest section.

Buses Await Commissioner's Approval.—The City Council of Massillon, Ohio, has agreed to permit the abandonment of the Northern Ohio Power & Light Company's line and substitution of buses if the Stark County Commissioners will approve the same. Application has been filed with the County Commissioners.

Financial and Corporate

Sale of Maryland Road Under Foreclosure July 27

In connection with the Circuit Court decree of June 17 appointing Walter C. Capper and Elmer J. Carter, trustees, to sell all the real and personal property, franchises and equipment of the Cumberland & Westernport Electric Railway, Cumberland, Md., the property will be offered for sale on July 27. The decree follows default in payment of the interest and principal on bonds secured by mortgages of which the Real Estate Trust Company, Philadelphia, is trustee.

The railway operates trolleys from Cumberland to Frostburg along the National Highway and buses from Frostburg to Midland, Lonaconing, Barton and Westernport, cars having been withdrawn a year ago from its rails between these points. The line is a consolidation of three separate companies. The property will be offered in three separate parcels and then sold as a whole. The franchise covers a right-of-way between Cumberland and Frostburg and through the thickly settled sections of the entire George's Creek Valley.

Havana Property Passes to Electric Bond & Share

Purchase of the common stock from the voting trustees of the Havana Electric Utilities Company, the successor to the Havana Electric Railway, Light & Power Company, by the Electric Bond & Share Company has been consummated. The deal terminates the voting trust of the purchased company, and out of the purchase price of \$33 a share the holders of voting trust certificates will receive \$31.50 a share.

The Electric Bond & Share was already the owner of a substantial number of the certificates and a majority of the outstanding preferred stock. It has been said that the latest purchase was preliminary to a rearrangement of the affairs of the operating subsidiary. The expectation is that Electric Bond & Share will transfer its holdings to the American & Foreign Power Company, Inc.

Ohio Traction Deal Approved

Stockholders of the Ohio Traction Company have approved the plan drafted by committees representing the preferred and common shareholders for merging the assets of the company with those of the Cincinnati Car Company. The new company will be known as the Cincinnati Car Company. There will be an organization meeting soon at which officers will be elected. Each holder of preferred stock is to receive 2½ shares of stock without par value in the reorganized company for every share held previously and each holder of common will receive one share without par value for each three shares of deposited common stock. The plan of the committees calls for the purchase

of all assets for approximately \$6,000,000. The assets included \$1,700,000 in cash on hand and liberty bonds, the Traction Building, Chester Park, the Cincinnati Car Company shops and 86,661 shares of Cincinnati Street Railway. In addition the committees will assume all existing liabilities, including ground rents under perpetual leases on the Traction Building and ground rents under perpetual leases on the Chester Park property.

Reorganization of Properties in Middle West Explained

The pending reorganization of the North American Light & Power Company, the holding company which owns the common stock of the Illinois Power & Light Corporation, the Missouri Power & Light Company and other related public utility properties, will not affect the Illinois Power & Light Corporation, Missouri Power & Light Company, or any of the operating subsidiaries of the North American Light & Power Company. All of them will continue to be operated as at present.

In the reorganization of the holding company, Clement Studebaker, Jr., will retain his holdings of the common stock and will remain as president and directing head of the holding company and all its subsidiaries. Certain new financing is in prospect, after which several new interests will come into the company and become associated with Mr. Studebaker in the ownership of common stock, among them the North American Company and Middle West Utilities Company. When the reorganization is completed the entire common stock ownership will be in these interests.

The new line-up will add to the financial and credit background and strength of the reorganized holding company and will facilitate the interconnection of these groups. The operating properties now controlled by the North American Light & Power Company adjoin in many places the operating properties of the Middle West Utilities Company and its allied companies. This is also true of the North American Company, although none of these operates in the same place.

Negotiations have long been in progress for the interconnection by high-voltage, long-distance transmission lines of the power sources of the three holding companies concerned and their subsidiary operating companies. Such interconnections will cover practically the entire Middle West.

As indicated previously the operating properties of the North American Light & Power Company include the Missouri Power & Light Company, the Illinois Power & Light Corporation and its subsidiaries in Des Moines, Iowa, and surrounding territory and in Topeka, Kan., and surrounding territory. It owns also the McKinley Bridge at St. Louis and the Illinois Traction System, the longest electric trunk line railroad in the world.

Falling Off in Passenger Revenue on Groversville Line

The passenger revenues on the electric division of the Fonda, Johnstown & Groversville Railroad, Groversville, N. Y., for the year ended Dec. 31, 1925, were \$689,449, against \$722,405 in 1924. The corporate surplus on Dec. 31, 1925, was \$434,015 and depreciation reserves \$686,980. These facts were contained in the fifty-fifth annual report to the stockholders.

SUMMARY OF PASSENGER TRAFFIC, FONDA, JOHNSTOWN AND GROVERSVILLE RAILROAD

Year	Number	Mileage	Revenue
1905.....	3,888,198	19,440,990	\$384,698
1906.....	4,546,843	22,734,215	434,120
1907.....	5,033,855	25,169,095	478,311
1908.....	5,000,041	25,000,205	468,375
1909.....	4,893,647	24,468,235	474,720
1910.....	5,536,312	27,681,560	534,665
1911.....	5,827,561	29,137,805	565,881
1912.....	6,090,627	30,453,135	565,836
1913.....	6,563,826	32,819,130	594,515
1914.....	6,695,788	33,478,940	598,846
1915.....	5,994,376	29,971,880	536,479
1916.....	6,877,764	34,388,820	610,094
1917.....	7,240,114	36,200,570	662,177
1918.....	6,672,802	33,364,010	675,477
1919.....	6,380,973	31,904,865	749,807
1920.....	6,612,659	33,063,295	828,760
1921.....	5,269,512	26,347,560	806,869
1922.....	5,579,227	27,896,135	816,464
1923.....	5,419,650	27,098,250	778,124
1924.....	5,019,498	25,097,490	722,405
1925.....	4,912,818	24,564,085	689,448

INCOME ACCOUNT OF THE FONDA, JOHNSTOWN AND GROVERSVILLE RAILROAD COMPANY

	1925	1924
Railway Operating Revenues:		
Freight revenue, steam division.....	\$453,287	\$454,614
Passenger revenue, steam division.....	36,977	39,038
Passenger revenue, electric division.....	689,448	722,405
Mail revenue.....	5,025	5,754
Express revenue.....	40,476	38,060
All other revenues from transportation.....	8,421	6,904
Revenue from other railway operations.....	12,205	13,087
Total operating revenues.....	1,245,843	1,279,864
Railway operating expenses:		
Maintenance of way and structures.....	\$165,077	\$164,159
Maintenance of equipment.....	149,362	147,508
Traffic expenses.....	7,935	7,518
Power.....	68,948	70,879
Transportation expenses.....	351,050	361,643
General expenses.....	78,781	84,172
Total operating expenses.....	\$821,156	\$835,882
Net revenue from railway operations.....	\$424,686	\$443,982
Railway tax accruals.....	86,199	92,235
Railway operating income.....	\$338,487	\$351,747
Miscellaneous operations (Saucandaga, N. Y., summer resort) —income.....	20,413	18,791
Operating income.....	\$358,900	\$370,539
Non-operating income.....	65,120	62,346
Gross income.....	\$424,021	\$432,885
Deductions from gross income other than interest charges.....	62,900	62,346
Balance (available for interest charges).....	\$361,121	\$370,539
Interest charges.....	318,167	315,240
Net income (available for dividends).....	\$42,953	\$55,298
Total dividends for year (preferred stock).....	30,000	30,000
Balance to profit and loss.....	\$12,953	\$25,298

Capital expenditures for the year have been confined to paving in cities, required by statute, and to the improvement of existing property. There was charged to investment, road and equipment expenditures for additions and betterments as follows: Paving cities of Amsterdam, Johnstown and Groversville, \$4,964; other improvements, \$4,730, or a total of \$9,694.

No securities have been issued since 1911 other than \$550,000 of 4½ per cent bonds in the year 1922 to retire an equal amount of 6 per cent bonds maturing in October and November of that year. All additions to property and equipment since 1911, amounting to \$766,781, have been met from surplus earnings.

The Fonda, Johnstown & Gloversville Railroad operates 82 miles of line.

An Innovation in Financial Advertising

The old order changes in investment practices as in everything else. It is a very interesting development, too, this latest announcement, of concern to utility operators and manufacturers. In the usual course of business the investment house participation in the financing of commercial, industrial and public utility companies is a process of the latter seeking out the former as a purchaser. Now, however, one of the leading investment houses in the country, Hornblower & Weeks, New York, is advertising its preparedness to purchase the entire bond issues of sizable and sound American railroads, utilities and industrial companies.

The popular conception of the investment house is that of a seller of securities. This is only natural, because its contact with the public is largely as a distributor of securities to individual investors. The question of the source of these securities is one to which the average layman gives little attention. The investment house, however, exercises a dual function, and purchasing security issues is fully as important as retailing them. So the firm of Hornblower & Weeks, a member of the New York, Boston, Chicago, Cleveland, Detroit, Providence and Salt Lake City Stock Exchanges and of the Investment Bankers Association of America and the American Bankers Association, rendering a specialized service to investors, is stressing its service to the corporation. These facilities include a stock department, handling stock accounts either on a cash or conservative loan basis; a bond department, which buys and sells all issues of bonds and notes of the United States and foreign governments, municipalities, railroads and equipment trusts and public utility and industrial corporations. This department also deals in high grade industrial and public utility stocks. Its unlisted securities department purchases or sells and secures quotations on all unlisted securities wherever a market exists. A statistical department analyzes securities, reports on market conditions, financial statements of different companies, appraises inventories of securities, furnishes all statistical data and assists in the making of tax returns. Its underwriting department arranges financing for municipalities, railroads, public utility and industrial corporations in any form desired. An expert engineering division is at the disposal of this department and it employs legal talent which specializes in corporate finance. A note department negotiates loans secured by approved collateral for corporations and individuals.

Basis Announced for Terre Haute Exchange

Holder of the common stock of the Terre Haute, Indianapolis & Eastern Traction Company have received letters from a committee representing the shareholders suggesting an exchange of their stock for preferred stock of the Indiana Electric Corporation, which is to be the name of a new corporation resulting from the merger of the Terre Haute, Indianapolis & Eastern and the Central Indiana Power Company.

The committee named the Land Title & Trust Company, Philadelphia, as depository. The proposed financial set-up provides for the exchange of ten shares of common stock of the Terre Haute, Indianapolis & Eastern for one share of participating adjusted preferred stock of a par value of \$100 of the new corporation. Holders of the 5 per cent cumulative preferred stock of the Terre Haute, Indianapolis & Eastern have provided for a share for share exchange for the preferred stock of the new company.

Traffic Fare and Wage Figures Reported

Electric railway passenger traffic in the month of May continued to show an improvement over the corresponding month of 1925. The number of revenue passengers, including revenue bus passengers, reported to the American Electric Railway Association by 207 companies for May, 1926, compared with May, 1925, was as follows:

May, 1926	806,401,269
May, 1925	792,564,416
Increase, per cent	1.93

The average cash fare in cities of 25,000 population and over was:

	Cents
June 1, 1926	7.6946
May 1, 1926	7.6689
June 1, 1925	7.5330

Average maximum hourly rates paid motormen and conductors in two-man service by companies operating 100 miles or more of single track:

	Average Hourly Rate (Cents)	Index Number 1913 = 100 (Per Cent)
June 1, 1926	56.73	208.18
May 1, 1926	56.67	207.96
June 1, 1925	56.20	206.24

Mauch Chunk Road Sold

The East Penn Electric Company, a subsidiary of the Pennsylvania Power & Light Company, has purchased the road and equipment of the Mauch Chunk Transit Company, Mauch Chunk.

It is the intention of the East Penn Electric Company to overhaul the road and to equip it with modern cars. This road traverses one of the beauty spots of America.

Pittsburgh Refinancing Plan Completed

Plans for refinancing of the Pittsburgh Railways, Pittsburgh, Pa., subsidiary of the Philadelphia Company, is practically completed. A general re-funding mortgage bond issue will be sold to retire all the outstanding mort-

gage bonds of the component companies. These amount to about \$11,575,000. Of these, two issues totaling \$489,000 have matured, but holders agreed to accept continuation of regular interest pending the recapitalization.

Denver a Stockholder in Its Tramway

The city of Denver, Col., became a stockholder in the Denver Tramway by accident. The tramway owed the city some back franchise taxes and did not have the ready money, so it sent some of its preferred stock, 275 shares. On June 19 the city received a check for \$1,031, dividends on its stock. Mayor Stapleton said: "I've got some stock to sell and I'm looking for a buyer." The City Council agreed to take the stock to co-operate with the tramway in its reorganization.

Allowed to Operate for Ninety Days.—Judge Will M. Sparks has granted authority in the Probate Court at Rushville, Ind., to permit the Indianapolis & Cincinnati Traction Company to operate 90 days longer. Judge Sparks acted favorably on a petition filed by Charles L. Henry, receiver and former president of the company, asking for an order to issue receiver certificates in the sum of \$156,000 to renew outstanding certificates falling due. The petition set out that the company did not have the money to meet the notes, and to keep the line operating it would be necessary to sell more 90-day certificates and to renew the notes which came due on June 26. Attorneys for the company's creditors objected to having the petition granted.

Vacancy on Directorate Filled.—Allen D. Jones, general auditor of the Interstate Public Service Company, Indianapolis, Ind., has been elected a member of the board of directors to succeed the late Bert Weedon.

Stock Acquisition to Build Up Line.—The Public Service Commission has authorized the Mohawk-Hudson Power Corporation to acquire and hold more than 10 per cent of the preferred and common stock of the Eastern New York Utilities Corporation, which now serves Rensselaer, Hudson and other municipalities in New York and operates an electric railroad between Albany and Hudson, covering 58 miles. The Mohawk-Hudson Corporation contemplates building up the electric road by adding bus feeders both to carry passengers and freight, thereby increasing the revenues of the electric railroad.

Four Months Traffic Report Shows Improvement.—The United Railways & Electric Company, Baltimore, Md., carried 75,364,849 passengers during the first four months of 1926, against 74,716,758 for the corresponding period of the previous year.

Purchase of Substations Arranged.—Purchase for \$119,000 of the West Seattle and James Street substations of the Puget Sound Power & Light Company is provided in an ordinance introduced in the City Council recently by the utilities committee. The deal for the stations has been delayed for more than a year because the Council and the company were unable to agree.

Book Reviews

The Highway and Its Vehicles

By Hilaire Belloc. The Studio, Ltd., London. 40 pages of text, 131 plates, 3 guineas.

The manner of our ancestors in their boudoirs, at banquets and on battlefields has been the subject of story and song for centuries, but not so often have they been met on the highways, and then only in very isolated cases. Through the concentration of a historian of no mean gifts, a fascinating and chronological record of our forefathers on the roads has now been presented. As if his words were not sufficiently convincing nor stimulating, Hilaire Belloc has enhanced the interest of his account, "The Highway and Its Vehicles," with 130 illustrations (24 of which are in color) collected by the Studio Company of London in a limited edition. The flight of a Flemish lady, pilgrims leaving Canterbury, Queen Elizabeth's visit to Blackfriars, a Florentine fête and a Milan masquerade are pictorially prominent in the romance of the highway, as explored by Mr. Belloc. This time, however, he has deviated from his usual practice. The gallant who halts the progress of the French sedan chair to kiss the hand of her ladyship, the stagecoach quipster traveling from London to Windsor, the carrier of the Spanish litter and the driver of the Russian droshky travel unnoticed past him, but the vehicles they ride in fascinate him and allure the reader, too.

Whither the vehicles go, the highway is sure to follow, with the bridge trailing after. This is a logical precedence, according to this historian. Then, too, there is historical evidence that the vehicle preceded the highway and was the cause of it. In early times barbarians moved about accompanied by wagons which did not traverse any roads, and the chariots of Greece and Roman Britain and Gaul fought upon unmade ground. A more modern proof is to be found in American colonization, where, he claims, the "Covered Wagon" has symbolized the nineteenth century movement toward the Rockies.

It was the invention of the wheel, a device to grind corn, mold clay, announce the direction of the wind and much later to effect Swanson close-ups, that brought about the vehicle that brought about the highway. The wheel is the work of man—"a creation he can well feel proud of."

It was not until the seventeenth century that general travel on wheels superseded the muleback and horseback era. Then came a change in the highway known as the turnpike, and by the nineteenth century general transportation by coach had ceased to be the exception and was the rule. Along with the evolution of the modern highway he flashes a picture showing the bicycle, the internal combustion engine, the railway epoch and the various transport eras down to the motor car period of the last twenty years.

But now all these processes have ceased, according to Mr. Belloc, and "we are in the midst of a vast, sudden and hitherto undigested and only half-comprehended revolution in the highway and its vehicles." The advent of the internal combustion engine producing the modern motor car has resulted in the combination of three incompatible things—the old narrow local highway gage, in most countries winding lanes with "blind" corners, and high speed. Something must give way—which is it to be? There are three factors which enter into the problem: First, the high cost of production; second, the disturbance of individual interest, and, third, our uncertainty about the future. But the greatest of these is the doubt about future transport. This hesitancy whether to metamorphose quickly a transportation system is a natural reaction in a generation which has seen so many and such rapid changes in that field. Mr. Belloc sees an interesting parallel in the tramway systems of European towns, which have occasion to feel the inroads of the motor car.

In the larger sense the new vehicle has not "made" the modern highway, as yet. However, Mr. Belloc's explorations on the highway lead him to suggest the end of the process—the restriction of heavy and rapid traffic to the main roads, provided the motor car has come to stay and is not replaced by any different form of vehicle.

Weary as we are from the wranglings over modern highway congestion, a glance at this pictorial epic of Europe on foot, on horseback and in coaches will delight the eye and a perusal of this romantic history will offer a needed respite. From the standpoint of printing, typography and illustration "The Highway and Its Vehicles" is the epitome of art.

Electrical Characteristics of Transmission Circuits

Compiled by William Nesbit, Westinghouse Technical Night School Press, East Pittsburgh, Pa. 317 pages, \$6.

This is a revised and enlarged edition, a reprint of a series of articles which appeared in the *Electric Journal* in 1922, with all the material of the previous work brought up to date and a considerable amount of new material as well. There are 22 chapters in this book with 28 charts and 102 tables.

A Bibliography on Research

By the National Research Council, Division of Engineering and Industrial Research, New York, N. Y. 46 pages.

This booklet lists selected articles from the technical press of 1923, 1924 and 1925. The primary purpose in compiling and cataloging these references, according to Maurice Holland, director of the Division of Engineering and Industrial Research, was an effort on the part of the division to "feel the pulse of industry" and to maintain a close contact with its research activities.

The Ethics of Business

By Edgar L. Heermance. Harper & Brothers, New York, N. Y. 244 pages. Price \$2.

Whatever the business, the industrial desideratum is public service. Although the chance to secure a substantial surplus is what leads the business man to risk his capital in new adventures, his sole thought is not business in terms of salary and profit. Less is heard of the "right" of the business man to run his business as he pleases, irrespective of any social purpose to be fulfilled. This is the message of Edgar Heermance in his presentation of the evolution of business ethics. He sees business today on safe ground after years of encounters with the storms of competition, commercial dishonesty, base advertising and credit inflation. The tempests were all weathered through the influence of the American Trade Association, an organization of employers. Out of the efforts of the association merged a changed philosophy on fair competition, fair profit, credit and contracts. The change from misleading and fraudulent advertising to the truth movement, started by A. T. Stewart and advocated later by John Wanamaker, was welcomed in an era when the need for house cleaning in the advertising profession was very evident. Several pages are devoted to outdoor advertising industry, in which the author has little tolerance for an indifference toward beauty of display. He considers good will the greatest asset in business. It is not a dutiful ideal, but rather a Utopian one.

In relations between competitors is seen the emergence of a great ethical principle, commonly called co-operation. Mr. Heermance prefers to call it the principle of common interest. He says when men in the same line of trade recognize that they have a common interest, and act accordingly, with due regard for the rights of the public, their relations become to that extent more normal, harmonious and productive.

In addition to his theories on the evolution of standards in business, the writer has recorded attempts made to improve codes in American industries. Witness an example of this in the code of electric railway associations and other utilities, which maintains that "a business that is legally protected against competition should be ever conscious of its ethical duty, untiringly vigilant in the protection of its good name, generously just in meeting its every obligation."

Whatever the achievement of business ethics, one feels more convinced than ever, after reading Mr. Heermance's book, that the idea of "every man for himself" suffered defeat by its own tactics and that the more satisfying and lasting philosophy "for the good of the people" is rewarded, and in the present world, too.

The book really is intended as an introduction to the study of social ethics, "ethics considered consistently from the social point of view." The student of sociology will find in the book much food for speculative thought. The casual reader will find the book full of interesting and revelatory data on methods in promulgating standards.

Personal Items

W. J. Harvie Resigns

Well Known Official Retires from New York State Road—Succeeded by L. E. Lippitt

William J. Harvie has resigned as general manager of the Auburn & Syracuse Electric Railroad, Syracuse, N. Y., and Lawrence E. Lippitt has been named as his successor by Talmadge C. Cherry, president of the road.

Mr. Harvie served as vice-president and general manager of the system for the past eight years. He retires because of ill health. Mr. Lippitt has been auditor and treasurer of the company for ten years. Mr. Harvie also resigned as vice-president of the Mid-State Coach Lines, motor bus subsidiary of the Auburn & Syracuse Railroad, and severed all connections with the industry, for the time being, in an effort to rebuild his health. He has left with a party of Auburn business men on a trip to upper Canada.

Nearly all of Mr. Harvie's electric railway work has been done with railways in central New York. He was born in Buffalo, N. Y. After receiving his high school education in that city he was employed in the operating offices of the Western Union Telegraph Company. He attended the Syracuse University, from which he was graduated in 1899 with the degree of electrical engineer. Previous to the year of his graduation from the university he had entered the electric railway industry in the overhead department of the Syracuse Rapid Transit Railway.

The latter part of 1900 Mr. Harvie was employed by the Syracuse, Lake Shore & Baldwinsville Railway, in various capacities in the car shops and power house. In 1901 he became connected with the Syracuse & Suburban Railroad as electrical engineer in charge of its power plant, car equipment and overhead lines.

In the fall of 1901 he became associated with the Andrews-Vanderbilt syndicate in charge of the construction work in Oneida for the Oneida Railway and also in charge of the overhead construction of the Little Falls extension of the Utica & Mohawk Valley Railway. In 1902 he was appointed electrical engineer of the Utica & Mohawk Valley Railway in charge of its power installation. This comprised one of the first 20,000-volt transmission lines with substations operated in the East. Later he was given charge of the mechanical department, being responsible for the operation of car shops located in Utica, Mohawk and Rome.

During 1905 and 1906 and the early part of 1907 the West Shore Railroad between Utica and Syracuse was electrified under Mr. Harvie's direct supervision, the construction being the "under-running third-rail type," which was one of the first installations of its kind in this country. Mr. Harvie was appointed chief engineer of the Syracuse Rapid Transit Railway and Oneida



W. J. Harvie

Railway in 1908, retaining his supervision over the Utica properties.

Mr. Harvie was elected president of the New York State Electric Railway Association at the meeting at Bluff Point in 1925. He has always taken great interest in the work of the New York association and also of the national associations, particularly of the American Electric Railway Engineering Association, of which he was president in 1910-11. He has also served on a number of committees of the American Electric Railway Association.

E. K. Miles Promoted at Syracuse

E. K. Miles has succeeded the late John Duffy as superintendent of transportation of the Syracuse, N. Y., lines of the New York State Railways. Mr. Miles was appointed by B. E. Tilton, vice-president and general manager. The new appointee had been assisting Mr. Duffy for some time, and during the latter's illness had practically taken over the entire work. The title of superintendent of transportation is a new one in the company and eliminates that of general superintendent, which Mr. Duffy had as supervisory official of both the Utica and Syracuse lines.



E. K. Miles

Mr. Miles became associated with the New York State Railways in 1908 as a motorman. He served in this capacity for eight years and then for two years he worked as a railway mail clerk. In December, 1918, he returned to the service of the New York State Railways as motorman instructor and four years ago he was made division superintendent in charge of the runs from the Tallman Street carhouse. Early this year Mr. Miles was appointed assistant to the general superintendent. It was at that time that F. Raymond Latta, then holding the position of assistant, resigned. Mr. Miles was considered a good choice for the responsibilities of this work. From the standpoint of experience he was well equipped in the fundamentals of the transportation department and his years of apprenticeship on the cars and as division superintendent gave him an understanding of all the necessary elements.

W. Kesley Schoepf Testimonial in Book Form

Permanent remembrance of the banquet given to veteran employees of the Cincinnati Traction Company, Cincinnati, Ohio, on Oct. 28 last by W. Kesley Schoepf, who retired as president after a quarter century of service, has been made in a book edited and published under the auspices of the Optimists Club and the Queen City Club of Cincinnati.

The address of Mr. Schoepf, which is printed in full, gives an insight into his character which is known only to his intimate associates. Loyalty to the men who had worked for the company during the period of his connection with it was an outstanding characteristic.

The volume also contains the other addresses made at the banquet, a list of the 454 men who received gold watches as a token of Mr. Schoepf's esteem and many letters of felicitation sent to him by his associates and employees. All of these breathe a spirit of the friendship and esteem in which he was held.

The book also contains several photographs of Mr. Schoepf, of the gifts which were bestowed by him and on him, and reproductions of pages from the album presented by the employees and bearing their signatures. It has a total of about 150 pages.

J. F. Egolf Goes to Chicago

John F. Egolf, general manager of the Aurora, Elgin & Fox River Electric Railway, Aurora, Ill., has become assistant to the vice-president of the Chicago Rapid Transit Company, Chicago, Ill. Mr. Egolf is well known in the railway field for the metamorphosis he effected in Aurora, steering that property out of a financial storm to a comparative calm. Also he is prominent for his activities as president of the Illinois Electric Railway Association.

He served as conductor on the Columbus Street Railway from 1898 to 1902, and then in the mechanical department of that company as a car repair man. In 1903 he went with the Columbus, Buckeye Lake & Newark Railway as a motorman, and again

served for two years on the platform, after which he was transferred to the dispatcher's office. This company was later absorbed by the Ohio Electric Railway, whereupon Mr. Egolf was sent to Springfield, Ohio, as chief dispatcher. In 1907 he was appointed assistant superintendent.

As varied as was his career up to that date, it didn't in any way exhaust his possibilities. He became dispatcher and chief dispatcher with the Chicago, Lake Shore & South Bend Railroad, was manager of the Springfield & Xenia Railway and later became affiliated with the Interurban Railway & Terminal Company, where he had charge of all operations until 1922.

In that year he became general manager for the receiver of the Fox River

division of the Aurora, Elgin & Chicago Railroad. This property was subsequently purchased by the Western United Corporation and early in 1925 Stone & Webster were engaged to operate it along with all the other subsidiaries of the Western United Corporation. Throughout these changes Mr. Egolf has been retained as general manager, having charge in that capacity of all the railway properties of the Aurora, Elgin & Fox River company.

Besides his natural inclination for work Mr. Egolf was gifted with special intuitive powers to understand men and their viewpoint. This idea, which made him regard his platform men as transportation salesmen, contributed in good measure to the development of the Fox River property.

A. W. Thompson Heads U. G. I.

Pittsburgh Railways Head, Under Whom Coffin Award Was Won, Selected to Succeed S. T. Bodine with Immense Holding Company—Assumes New Duties on Sept. 1

ARTHUR W. THOMPSON, Pittsburgh, was elected president of the United Gas Improvement Company, Philadelphia, on July 20. He succeeds Samuel T. Bodine, who was elevated to the newly created post of chairman of the board of directors. Mr. Thompson is president of the Philadelphia Company, which operates all of the utility companies in the Pittsburgh district. He is closely associated with the Mellon banking interests of that city and he also is a director of the Pennsylvania Railroad. He will assume his new office on Sept. 1. It was the Pittsburgh Railways, of which he is the head, that won the Coffin award last year and it was Mr. Thompson who personally accepted the award at Atlantic City in behalf of the company, its employees and the city.

In a statement Mr. Bodine said:

It gives me great pleasure to announce the fact that I have succeeded in my efforts further to strengthen the organization of our company by obtaining the services of Arthur W. Thompson and that my recommendation has been unanimously approved by the board of directors and made effective by my election as chairman of the board of directors and Mr. Thompson's election as president, both elections becoming effective on Sept. 1, 1926.

Mr. Thompson is at present and has been for a number of years president of the Philadelphia Company and of its various subsidiaries which operate the gas, electric and transportation utilities of Pittsburgh, including the Duquesne Light Company, whose electric plant is confessedly one of the most efficient in the United States. He is in the prime of life and is one of the recognizedly successful leaders in the public utility field.

As chairman of the board of directors Mr. Bodine will continue to serve the shareholders as actively as in the past and with the same authority in shaping and directing the policies of the company.

The United Gas Improvement Company is a large operator of public utility properties, especially electric light plants outside of Philadelphia. It has a large interest in the Public Service Corporation of New Jersey. Many moves regarded as especially

significant have been made recently in its affairs and the affairs of the companies affiliated with it. Among them these changes have been noted:

Retirement of the outstanding preferred stocks by both the United Gas



A. W. Thompson

Improvement Company and the Philadelphia Electric Company.

A financial readjustment plan of the Public Service Corporation's gas and electric companies' holdings.

A plan for the readjustment of the capital structure of Public Service railway holdings, with the possibility that a new company will be organized, thus eliminating railway operations from any merger plan of the future.

Election of Thomas S. Gates of Drexel & Company to the board of directors of the Public Service Corporation of New Jersey.

Election of Thomas N. McCarter, president of the Public Service Corporation of New Jersey, to the board of directors of the United Gas Improvement Company.

Election of Edward Hopkinson, Jr., one of the best-known banking and public utility lawyers in Philadelphia, to membership in the firm of Drexel & Company.

Edward T. Stotesbury, senior mem-

ber of Drexel & Company, is a director of the United Gas Improvement Company. Horatio G. Lloyd, another member of the Drexel firm, is on the board of the Philadelphia Electric Company. Drexel & Company are recognized as the bankers of the United Gas Improvement Company, the Philadelphia Electric Company and the Public Service Corporation of New Jersey.

Mr. Thompson, the new president of the United Gas Improvement Company, was born in Erie on May 8, 1875. He was graduated from Allegheny College, Meadville, in 1897 with a degree of C.E.

While still in college he began work as rodman on location with the Pittsburgh, Bessemer & Lake Erie Railroad. Shortly after his graduation he joined the Baltimore & Ohio Railroad's engineering staff as chief of a party of surveyors. In his eighteen years service with that system he rose to be third vice-president in charge of traffic and commercial development.

On June 1, 1918, he was made federal manager by the United States Railroad Administration of several large Eastern railroads. He became president of the Philadelphia Company in February, 1919. Since that time he has made considerable progress in building up the varied properties of the company, especially the railway system.

On July 2 Mr. Thompson announced his resignation to the public of Pittsburgh. In leaving Pittsburgh Mr. Thompson said he would retain his position in the board of directors of the Union Trust Company, Pittsburgh and other directorates not subsidiary to the Philadelphia Company. He has not resigned his place on the directorate of the Pittsburgh Chamber of Commerce and other civic organizations. His large personal staff brought by him from Baltimore seven years ago, he said, probably would remain with the Philadelphia Company, only two or three secretaries going with him.

Obituary

W. S. Hamilton

William S. Hamilton, Rochester, supervisor of stores for the New York State Railways, Rochester, Syracuse and Utica Divisions, and brother of James F. Hamilton, president of the company, died on June 25 at the Syracuse General Hospital after an illness of ten weeks. He was 56 years old. As noted briefly in the JOURNAL for July 3 Mr. Hamilton was stricken with apoplexy while on a business trip to Syracuse. Born in Birdsall, N. Y., he entered electric railway work at an early age. For twenty years prior to his going to Rochester he lived in Schenectady, where at one time he was superintendent of the Schenectady Railway, but not president, as incorrectly stated in a previous item. His early railway work was with the Buffalo Railway, now the International Railway. He left this company about 1905 to become station master with the Schenectady Railway. He remained with this company for about twenty years, being appointed in 1916 superintendent of transportation and in 1920 general superintendent.

Manufactures and the Markets

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

Importance of Industrial Advertising Recognized

Harvard Award of \$2,000 Will Be Made for Best Campaign of Year Conducted in Industrial Journals

An award of \$2,000 will be given for the first time this year, as a part of the Harvard Advertising Awards, for the advertising campaign of the year coming under the consideration of the jury of award as the campaign most conspicuous for the excellence of its planning and execution which seeks publicity for industrial products primarily through the media of industrial, trade or professional journals.

Industrial products seeking publicity through general popular magazines may compete for the award of \$2,000 given for the best national campaign, either of an institutional character or devoted to the advertising of specific products. Four prizes of \$1,000 each are offered for individual advertisements most effective in use of text, most effective in pictorial illustration, in combination of both, and in typography.

A gold medal is awarded annually to the individual or organization deemed by the jury of award to merit recognition for distinguished contemporary services to advertising. The Harvard Advertising Awards were founded by Edward W. Bok in 1923 and are administered by the Harvard Business School. Awards are made annually, and advertising material to be considered for the current year must be received by the secretary of the Harvard Business School on or before Dec. 31, 1926. The jury, the personnel of which will be announced later, will make the awards early in January.

Railway Utility Ventilators Specified

Ventilators on the ten new cars being built for the New York, Westchester and Boston Railway by the Pressed Steel Car Company will be supplied by the Railway Utility Company of Chicago, Ill. These ventilators are similar in all respects to those which were specified on the ten cars which constituted a preceding order made some time ago by the suburban line. Specifications on the most recent cars were published in the issue of ELECTRIC RAILWAY JOURNAL for June 26, page 1130.

St. Louis Increases Car Building Facilities

Construction work has been started by the St. Louis Car Company on two new buildings for its plant group located at 8000 N. Broadway, St. Louis, Mo. The buildings will be used for

steel fabricating and for the erection of cars. The main unit will be 1,000 ft. in length and 130 ft. in width and equipped with four 10-ton cranes, 60 ft. in span. Light steel materials will be housed in the second building, which is to be 100 ft. in length and 60 ft. in width. This building will be attached to a 250-ft. crane runway steel yard equipped with a 60-ft., 10-ton crane.

Cleveland Convention Exhibit to Be Best Ever

Applications for exhibit space have far exceeded the expectations of the American Railway Association, as revealed at the meeting of the exhibit committee held in Cleveland on July 8. A 180-ft. extension to the new building was decided on to care for this surplus.

The assignment, including 193 exhibitors, has been practically completed for 108,101 sq.ft. of space exclusive of any outdoor exhibits. This far exceeds the requests in any past year at this time. In addition to the above there were ten requests for outside track space which total approximately 800 lin.ft. of trackage.

Last year the overflow from the Million Dollar Pier in Atlantic City had to be cared for in a somewhat unsatisfactory tent annex. This year adequate accommodations will be available in an extension of the west wing of the auditorium, decided upon as a result of the July 8 meeting.

The new building will be of steel and stucco construction, having a minimum headroom of 18 ft. Adequate lighting, both natural and artificial, with the wide aisles and interior decorations planned, will make this a most attractive exhibit space. A solid tongued-and-grooved floor will be used in the new building instead of the barberton gravel flooring originally planned.

This building will be 600 ft. long, extending the full length from St. Clair Avenue to Lakeside Avenue. It will be 200 ft. wide for the portion originally planned and 100 ft. wide for the extension which was decided on. While new drawings are being made showing this extension the original layout is not materially changed, except that the entire new structure will be moved westward and the track areas placed between the present and the new auditoriums.

An extensive pergola or arbor, covered with striped awnings with growing vines at the side, will connect the two buildings. The track exhibit will be on the south of the pergola and the track maintenance exhibits under the awning and arbor connecting the two buildings with a garden on the north side of the pergola.

A great drive is being made for a large exhibit of cars to be placed in the track space between the two buildings.

With many requests for such space now on hand and several promises recently received from operators as well as manufacturers, it appears that this will be a truly representative exhibit of modern car development, including both urban and interurban types.

The auditorium proper has two floors. The arena is known as section A and the exhibition hall is known as section B. The new building to be erected is section C, and the D section is the open-air space between the two buildings under the pergola and section E is the track space.

The committee meeting was well attended and the spectacular plans developed by the local Cleveland committee were received with approbation. Those who attended the exhibit meeting and space assignment were: J. H. Alexander, chairman; C. H. Clark, S. J. Cotsworth, John A. Dewhurst representing Charles Gordon, H. Fort Flowers, B. A. Hegeman, Jr., R. Roy Holden, A. L. Kippenberger, J. R. McFarlin, J. C. McQuiston, A. Frank Paul, A. L. Price, A. M. Robinson, James W. Welsh, Fred B. Bullock, assistant to Colonel Alexander; Fred C. J. Dell, director of exhibits, and Thomas J. Segrave, assistant to Mr. Dell.

Haskelite Adds Publishing to Its Other Functions

During the past month a new publication has spread its wings in the air. To the newcomer in the field of house organs has been given the name *Light Weight Champion's Record*, the suitability of this title being easily recognized when it is learned that it is being published by the Haskelite Manufacturing Corporation of Chicago. It is planned to fill the little paper, a 9x12-in. leaflet, with interesting news of the 101 applications for Haskelite and Plymetl, covering all of the industrial fields. As an example of the manner in which this policy will be carried out, the first issue contains brief, pithy notes on the manner in which these lightweight materials have been adapted to street cars, buses, commercial cars, signs and airplanes in various sections of the country.

Powerful Locomotives for the Pennsylvania

Seven of the most powerful electric locomotives ever built are to be constructed by the Pennsylvania Railroad in its shops in Altoona, Pa. The contract for the equipment has been let to the American Brown Boveri Electric Corporation. Each locomotive will have four driving motors with a combined capacity of 3,640 hp., a driving axle load of 75,000 lb. and 80-in. driving wheels. They will be usable either as high-speed passenger locomotives or for pulling the heaviest freight. As freight locomotives they will be able to haul 100 loaded cars at 35 m.p.h., it is said.

It is planned to use the seven new locomotives to replace smaller electric engines now employed in the service between Manhattan Transfer and New York City. Later they may be used on the main line between Philadelphia and Wilmington when that stretch has been completely electrified.

Final Delivery of Little Rock Cars Will Soon Be Made



Work on the 30 single-truck, single-end, one-man safety cars ordered by the Arkansas Central Power Company, Little Rock, Ark, is being rapidly pushed to completion by the American Car Company, St. Louis, Mo. As noted in the issue of ELECTRIC RAILWAY JOURNAL for June 19 delivery has already been made of six of the new units. The cars will seat 33 passengers and are of all-steel construction. Advertising slogans or message signs are painted on both sides of each car. Public interest has reached quite a high point in Little Rock over this equipment. Specifications follow:

- Length over all 28 ft. 6 1/2 in.
- Truck wheelbase 8 ft. 0 in.
- Width over all 8 ft. 3 in.
- Height, rail to trolley base 10 ft. 5 in.
- Body All steel
- Interior trim Birch, natural wood finished
- Headlining 3/4-in. Agasote, with Celotex insulation
- Roof Arch
- Air brakes General Electric
- Axles Brill
- Bumpers Channel with automobile type
- New Era Spring & Specialty Co. bumper car signal system Faraday

- Car trimmings Polished bronze
- Center and side bearings Brill
- Compressors CP-25
- Control K-63
- Curtain fixtures Rex, National Lock Washer Co.
- Curtain material Pantasote Pat. J-86, morocco
- Destination signs Hunter illuminated
- Door-operating mechanism National Pneumatic
- Fare boxes Johnson
- Fenders HB
- Finish Duco
- Gears and pinions General Electric
- Hand brakes Brill vertical type
- Heater equipment Consolidated Car Heating Co. truss plank
- Headlights Golden-Glow SM-95
- Journal bearings Friction
- Journal boxes Brill
- Lightning arresters General Electric
- Motors Two GE-264-A, inside hung
- Sanders Ohio Brass
- Sash fixtures Dayton
- Seats Brill 105-A, modified
- Seating material Chase's X grade plush gray
- Springs Brill
- Step treads Kass
- Trolley catchers Ohio Brass No. 13141
- Trolley base General Electric
- Trolley wheels General Electric
- Trucks Brill 79-E with special solid forged side frame
- Ventilators Brill exhaust
- Wheels Southern Car Wheel Co., 26-in.

Southern Properties Will Soon Receive 33 Light-Weight Cars

Delivery is expected to be made on July 25 of the ten cars recently ordered from the Light Weight Noiseless Electric Street Car Company, Chicago, Ill., by the Tennessee Electric Power Company of Chattanooga, Tenn. This company, one of three Hodenpyl-Hardy properties in the South which have placed similar orders for equipment, plans to place the new units in immediate service following delivery and the necessary testing. Ten cars of the same type will be delivered to the Nashville Railway & Light Company, Nashville, Tenn., about Aug. 15 and thirteen more, also of the same construction, to the Southern Indiana Gas & Electric Company, Evansville, Ind., about Sept. 1. The order for this rolling stock was placed on April 23, 1926. The cars will be for one-man, two-man operation and will have a seating capacity of 44.

Dimensions of the cars in the individual orders are not quite similar, nor is the brake equipment on the several cars. The ten Tennessee Electric Power cars are 8 ft. 6 in. wide and 40 ft. 3 1/2 in. long. The Nashville cars are 8 ft. 2 in. wide and 39 ft. 6 in. long. The Southern Indiana units are 8 ft. 6 in. wide and 37 ft. 9 in. long. The cars in the first-named order are equipped with Westinghouse air brakes and DH-16 compressors. All of the other cars have Westinghouse brakes and CP-27 compressors. Safety Car Devices equipment is used throughout. Specifications follow:

- Weights:
- Car body 10,000 lb.
 - Trucks 7,000 lb.
 - Equipment 10,500 lb.
 - Total 27,500 lb.
 - Bolster centers, length 19 ft. 6 in.
 - Length over all 40 ft. 0 in.
 - Truck wheelbase 4 ft. 6 in.
 - Width over all 8 ft. 6 in.
 - Height, rail to trolley base 10 ft. 1 in.
 - Body Steel frame, Haskellite covered
 - Interior trim Mahogany
 - Headlining Haskellite
 - Roof Arch
 - Armature bearings SKF roller
 - Axles Lightweight Noiseless Co.
 - Bumpers Car builders' standard
 - Car signal system Faraday high tension
 - Car trimmings Car builders' standard
 - Center and side bearings Car builders' standard
 - Compressors Westinghouse DH-16; General Electric CP-27
 - Control K-75
 - Couplers Lightweight Noiseless Co.
 - Curtain fixtures National Lock Washer
 - Curtain material Pantasote 85-77
 - Destination signs Hunter illuminated
 - Door-operating mechanism Consolidated Car Heating Co.
 - Fare boxes Johnson Fare Box Co.
 - Fenders Car builders' standard
 - Gears and pinions G. E. noiseless type
 - Hand brakes Pittsburgh, drop handle
 - Heater equipment Consolidated Car Heating Co.
 - Headlights Golden Glow
 - Journal bearings Hyatt roller
 - Journal boxes Lightweight Noiseless Co.
 - Lightning arresters G. E. aluminum cell
 - Motors Four GE-258 K, inside hung
 - Finish Enamel
 - Sanders Car builders' standard
 - Sash fixtures Car builders' standard
 - Seats Hale & Kilbourn, Walkover type
 - Seating material Kemi-Suede
 - Springs Car builders' standard
 - Step treads Kass safety tread
 - Trolley catchers Ohio Brass and Keystone
 - Trolley base Ohio Brass
 - Trolley wheels Moore-Jones, 4 in. 5 in.
 - Trucks:
 - Smith No. 12, light weight, roller bearing
 - Ventilators Car builders' standard
 - Wheels 26-in. rolled steel
 - Special devices, etc.:
 - Economy meters, exit treadle step control, Sangamo economy power meters used on Tennessee Power Company and Nashville cars.



Unusual Attention Has Been Given to Riding Comfort in Designing the Seats for These Little Rock Cars

Babbitt Consumption Falls Off

A decrease in the total consumption of Babbitt metal for the month of May was noted over the preceding month and also over May, 1925. Calculations made by the Department of Commerce from reports received from 27 firms

	Total (Apparent Consumption), Lb.	Sales (By Manufacturers), Lb.	Consumption (By Producers), Lb.
1925			
January.....	5,683,183	4,620,815	1,062,368
February.....	5,164,619	4,103,340	1,061,279
March.....	5,644,288	4,395,901	1,248,387
April.....	5,126,416	3,928,136	1,198,280
May.....	5,081,668	4,189,558	892,110
Total (five months).....			
	26,700,174	21,237,750	5,462,424
June.....	5,074,966	4,085,125	989,841
July.....	5,184,196	3,694,386	1,489,810
August.....	5,441,823	4,068,706	1,373,117
September.....	4,621,033	3,579,780	1,041,253
October.....	5,550,247	4,169,870	1,380,377
November.....	4,954,683	3,534,026	1,420,657
December.....	4,878,806	3,910,160	968,646
Total.....			
	62,405,928	48,279,803	14,126,125
1926			
January.....	5,152,694	3,708,383	1,444,311
February.....	5,139,952	3,867,710	1,272,242
March.....	5,860,543	4,852,805	1,007,738
April.....	5,229,199	3,817,253	1,411,946
May.....	4,797,038	3,640,369	1,156,669
Total (five months).....			
	26,179,426	19,886,520	6,292,906

showed the total apparent consumption to be 4,797,038 lb., as compared with 5,229,199 in April and 5,081,668 in May, 1926. The consumption is calculated from sales by manufacturers and consumption by such firms as consume their own production. The accompanying table shows the sales of the metal as separated from the consumption in the producing plants.

Kawasaki Builds Freight Locomotives in Japan

Last year the South Manchurian Railway ordered three 173-ton electric locomotives for transporting coal from the Fushun Colliery. Contracts for these locomotives were awarded to the Kawasaki Dock Yard Company, Kobe, Japan. All mechanical and electrical equipment was designed and built by the Kawasaki company.

The locomotives have recently been shipped to Fushun and are now in service there. They have a one-hour rating of 1,200 hp. at 1,200 volts d.c. Four 300-hp. motors, with a 17:89 gear ratio, are provided on each locomotive. The wheel arrangement is 0-4-4-0 and

Metal, Coal and Material Prices

Metals—New York		July 6, 1926
Copper, electrolytic, cents per lb.....		13.875
Copper wire, cents per lb.....		16.00
Lead, cents per lb.....		8.275
Zinc, cents per lb.....		7.57
Tin, Straits, cents per lb.....		62.375
Bituminous Coal f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....		\$4.425
Somerset mine run, Boston, net tons.....		1.95
Pittsburgh mine run, Pittsburgh, net tons		1.75
Franklin, Ill., screenings, Chicago, net tons		1.825
Central, Ill., screenings, Chicago, net tons..		1.50
Kansas screenings, Kansas City, net tons		2.425
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....		\$6.25
Weatherproof wire base, N. Y., cents per lb		18.00
Cement, Chicago net prices, without bags		2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.		11.80
White lead in oil (100-lb. keg), N. Y., cents per lb.....		15.00
Turpentine (bbl. lots), N. Y., per gal.....		\$0.88

the trucks are of the swivel, center cab type. Multiple-unit control is provided on each of the three units. The locomotives are capable of hauling 1,150 tons over a level profile at a speed of 15 m.p.h. and have a rate of acceleration of 0.215 ft. sec.² They have a maximum tractive effort of 40,200 lb. and a maximum speed of 40 km. per hour or approximately 25 m.p.h.

The three units have a high-speed breaker each, Westinghouse EL-14 air brakes, two motor blowers, one motor-generator and two motor air compressors.

Following are some of the principal dimensions of the locomotives: Length over all 13,590 mm., or 30 ft. 5½ in.; gage of track, 1,435 mm., or 56½ in.; width over all, 3,000 mm., or 9 ft., 10½ in.; height over all 3,700 mm., or 12 ft. 1½ in.; diameter of wheel, 1,250 mm., or 4 ft. 1½ in. Weights—Mechanical equipment, 48 tons; electrical equipment, 25 tons; total weight on driver, 73 tons.

Rolling Stock

Hamilton Street Railway, Hamilton, Ont., in accordance with its new agreement plans to spend \$1,250,000 during the next three years for new cars, buses and carhouses.

Johnstown Traction Company, Johnstown, Pa., has just received two new submarine type cars, costing approximately \$10,000 each, for use in city service. These cars are exact duplicates of the units which were procured several months ago.

Minneapolis Street Railway, Minneapolis, Minn., has signed a \$125,000 contract for the construction of ten gas-electric motor buses, which will be used to start the first bus service through the loop and residential districts of the city. The new service will be initiated as supplementary to the street car service in September, according to T. Julian McGill, vice-president of the company in charge of operations. The buses, which will be operated by the Twin City Motor Bus Company, the bus operating subsidiary, will be of the type now in use at Buffalo, N. Y., and Philadelphia.

Track and Line

Johnstown Traction Company, Johnstown, Pa., is laying new rails on the inbound track on Franklin Street. Rails on the outbound tracks are to be laid later from Main Street to Fockler's Corner.

Boston Elevated Railway, Boston, Mass., plans to cut through the wall on the outbound side of the Kendall Station in the Cambridge subway, and when permission is granted by the Public Utilities Commission will construct an underground passage to the surface. This improvement will serve as a convenient route for the transfer of passengers from the subway to buses.

Pacific Northwest Traction Company, Seattle, Wash., following the approval of an ordinance is permitted to lay double track along Stewart Street from Eighth to Ninth Avenues, at the

site of the proposed new \$500,000 interurban and bus station. The action is a formal step in the plans for the new terminal planned by the traction company, which is a subsidiary of the Puget Sound Power & Light Company. The interurban terminal was referred to in the ELECTRIC RAILWAY JOURNAL issue of March 20, page 524.

Trade Notes

B. M. Horter, formerly of the Philadelphia office of the Cutler-Hammer Manufacturing Company, has just been appointed manager of the company's Boston office. He succeeds J. M. Fernald, who has resigned.

G. C. Kuhlman Car Company, Cleveland, Ohio, a subsidiary of the J. G. Brill Company, at a meeting of the board of directors on June 23 elected Harry K. Hauck, general manager, a vice-president to succeed J. W. Rawle, resigned. R. H. Watts, who has been secretary and assistant treasurer, resigned the latter office and was elected assistant to vice-president in addition to his office as secretary. T. B. Richardson succeeds Mr. Watts as assistant treasurer. Mr. Hauck joined the Kuhlman organization in June, 1919. Before that he was affiliated with the Carnegie Steel Company and the Bethlehem Steel Corporation. He was graduated from Lafayette College, in Easton, Pa., his native city.

New Advertising Literature

Ohio Brass Company, Mansfield, Ohio, has issued a leaflet reprinted from the May 8, 1926, issue of the *Electrical World*, telling how every 25 seconds another O. B. suspension unit joins its fellow units doing their part in preserving continuity of the world's power supply.

General Electric Company, Schenectady, N. Y., has issued Bulletin G.E.A.-319, describing separable post type insulators for use on outdoor switching installations handling from 88,000 to 220,000 volts.

Leon L. Wolf Waterproof Fabric Company, Cincinnati, Ohio, is distributing a unique little folder exploiting the merits of Kemi-Suede, the new material which is being specified for roofing, flooring, upholstering and curtains for electric traction cars, buses and taxicabs. A cut-out effect shows a swatch of Kemi-Suede over which the reader is asked to rub his thumb as he picks up the unusual folder. Inside is found the pasted-on swatch, together with a brief story about this waterproof material. On the back of the folder is shown a complete list of representatives of the company, as follows: Grayson Railway Supply Company, 600 LaSalle Building, St. Louis; Sisson Supply Company, 1845 Grand Central Terminal, New York; Wolverine Supply Company, 8242 Woodward Avenue, Detroit; J. P. Armstrong, Balboa Building, San Francisco; Lyman Tube & Supply Company, Ltd., Montreal, Toronto, Vancouver, Canada; Parker, Peebles & Knox, Inc., 44 Whitehall Street, New York, for export.



Atlanta's progressive program calls for Peacock Staffless Brakes

During 1925 the Georgia Railway and Power Company put forty new one-man cars in city service. This same company recently ordered sixty more new cars for operation in and around Atlanta, Ga. And every one is equipped with the most modern hand brakes—

Peacock Staffless Brakes

These brakes occupy minimum platform space, are simple of operation, have a demonstrated capacity for winding in 144 inches of chain, and have proved their ability to reduce installation and maintenance costs.

Send for facts and figures that bear out these statements—and for estimates on your requirements.

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890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada



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NAUGLE POLES

WESTERN & NORTHERN CEDAR

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For Locomotives, Passenger, Freight and Electric Cars

Smooth Forged or Rough Turned—Carbon or Alloy Steel—Plain or Heat Treated, Forged and Turned Piston Rods, Crank Pins, Large Shafts, Round Bars, etc.

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ELECTRICAL WIRES and CABLES

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A Single Segment or a Complete Commutator

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

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We guarantee

all grades of poles; also any butt-treating specifications

BELL LUMBER COMPANY

Minneapolis, Minn.

BRAZED Rail Bonds ARC WELD

Portable Arc Welding Outfits

The Electric Railway Improvement Co.

Cleveland, Ohio



MOHAWKS

Go Farther!

Massive oversize tires as large as rim and clearance permit. Their extra size and super quality provide an unequalled margin of safety, insuring uninterrupted service and lowest upkeep. Try them next time.

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GOODYEAR

The above relief map of Yellowstone National Park, showing the routes of the Yellowstone Park Transportation Company, is supplied through the courtesy of the Northern Pacific Railway Company

Nine Years on the Trails of Wonderland

Again this year, as for the past eight years, the passenger buses and special touring cars of the Yellowstone Park Transportation Company are equipped exclusively with Goodyear Tires.

The Company operates a fleet of 270 ten-passenger buses and 47 seven-passenger touring cars. These vehicles are the chief sight-seeing reliance of about one-third of all the people who visit Yellowstone National Park. Last year, 44,786 passengers toured the Park this way, on Goodyear Tires.

This is a service, given daily, rain or shine, in which the best of tires must do their best. The roads of wonderland lead to glorious sights for those who ride, but to the tires they are so much graded dirt and gravel, or, worse, the sharp obsidian rock that is volcanic glass.

Here you must have tires with the stubborn hold-fast power of gripping tread. Here you must have tires with rugged strength of bead and wall and carcass.

Here you have, performing with safety and with constantly more marked economy, Goodyear All-Weather Tread Cord Tires.

This is the kind of service that Goodyear Tires everywhere deliver.

They deliver it with all the strength of Goodyear cord construction, with all the safety and surety of Goodyear perfected design, with all the lasting, lower-cost economy and riding ease embodied in that new cord fabric—SUPERTWIST.

Goodyear Tires, and only Goodyear Tires, are made with SUPERTWIST.

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



Remodeling the car barn!

If your problem is to remodel part of the car barn into a bus garage, let our engineers help. They know, by experience, what is most efficient.

Maybe your conditions require outside fueling and oil service. We have the right equipment. Maybe you would do better with your equipment inside the garage. We have that, too.

The big thing is to invite our engineers to consult with you; by doing so, you bring broad experience, exact knowledge and interested brains to your help. For further details of this without-obligation service, please address Dept. 51.

	S.F. BOWSER & COMPANY, Inc. <i>Pump and Tank Headquarters</i> FORT WAYNE, INDIANA.	
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Transportation Between the Principal Cities of

Yellowway
INC
1738 CALIFORNIA STREET
PHONE MAIN 4718
DENVER, COLORADO

May 5, 1926

Garford Motor Truck Co.
Lima, Ohio.

Attention Mr. F. E. Borer.

Dear Sir:

17439 Miles are now registered on my Garford Greyhound, and I can now state that the performance is 100%. My run between Denver and Kansas City presents some very tough going for any bus, particularly during the past few weeks. We have had several trips where it was necessary to run in low and second gear at a speed of less than ten miles per hour with both axles dragging for hundreds of miles at a stretch. This has been a tremendous test for a bus and my Garford has come through in fine shape.

In spite of the very adverse conditions under which I have been operating, I am very well pleased with the low cost of operation shown by my bus. I am getting an average of 10 miles per gallon of gas. My oil is changed at each end of the run, 700 miles, and I add about a half gallon between drainings. To date I have experienced no mechanical expense.

In the light of my experience, I certainly feel that my investment in a Garford is going to prove very profitable. I have watched the performance of other buses operated by my competitors on this run and am satisfied that my bus will still be running and bringing me in a profit long after their equipment is worn out.

My only item of heavy expense has been for tires and this has been due to blow outs on rears which have no other sign of wear on the tread. My front tires are good for so much more mileage as I now have before it will be necessary to replace them.

A bus which will stand the punishment which mine has received since it was put on the run ought to last indefinitely on reasonably good roads.

Yours very truly
A. F. Shumate
A. F. Shumate

Extreme Performance

No better testimony as to the stamina and dependability of the Garford Greyhounds could be asked for than the one here shown. No buses have been subjected to more severe tests than those put to the Greyhound Buses on the Yellowway route between Kansas City and Denver, where mud and mire, miles at a stretch, hindered their daily progress. But, the Garford Greyhounds, light in weight, sturdy in construction, untiring on the long run, meet schedules with clock-like regularity in all seasons—in many and various parts of the world—and at a surprisingly low cost for oil, gas and mechanical service. Greyhound Buses are setting new standards in performance for both operator and passenger.



Write for the Garford "Quality Built" Book which contains detailed information regarding the Greyhounds.

THE GARFORD MOTOR TRUCK CO.
743 Wapak Road
Lima, Ohio

Fort Snelling-Mendota Bridge across Minnesota River near Minneapolis will contain 76,000 cubic yards of concrete. Length 4119 feet. Height, from normal low water to bridge floor, 120 feet.

Walter H. Wheeler, Designing and Consulting Engineer with the C. A. P. Turner Company Associated, prepared the plans and specifications for this job, and is also supervising the construction.



These Engineers Get Quality Concrete Using Economical Mix

QUALITY control jobs now attract attention not because there are few of them, but because there are so many. The Fort Snelling-Mendota Bridge now being built across the Minnesota River near Minneapolis is one of the outstanding examples.

Those in charge of this job are following this basic principle: Assuming a workable mix, the strength of the concrete is determined by the relation which the volume of mixing water bears to the volume of cement.

Field tests, made regularly during the progress of the work, show that predetermined strengths are being consistently obtained.

In addition, grading and proportioning of aggregates within the range of workability are giving the most economical mix and a fine, uniform texture.

Further information about field control will be gladly sent on request, if you will write the nearest office listed below. Ask for a copy of "Design and Control of Concrete Mixtures." There is no obligation.

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Real leather upholstery The invitation to "come right in"

In fact, the public showed great interest in a street car that the Cleveland Railway recently put into operation—in which leather seats had been used.

People love luxury and readily pay for the opportunity to ride in comfortable seats.

Furthermore your cost - per - mile -

maintenance is greatly reduced by using real leather on seats. Leather will stand up years longer than any other covering.

We offer you complete hides or will cut them to pattern. Send for samples. The Cleveland Tanning Co., Dennison Ave. and Jennings Road, Cleveland, Ohio.

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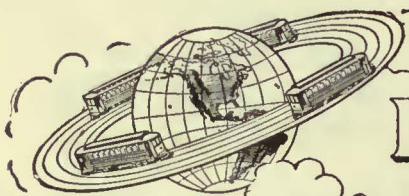
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The Finest Coach Leather Obtainable

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK

Make it easy for Joe and you'll make it easy for your pocketbook!



JOE has plenty of muscle. It doesn't matter to him what kind of between-track pavement you tell him to tear out. He'll rip it up and offer no complaints.

However, he'll get more done if the pavement is vitrified brick, asphalt-filled.

Each brick in such a pavement remains a separate unit, easily removed, easily replaced—and you don't need a fresh batch of surfacing materials to finish the job. The salvage value is nearly 100%.

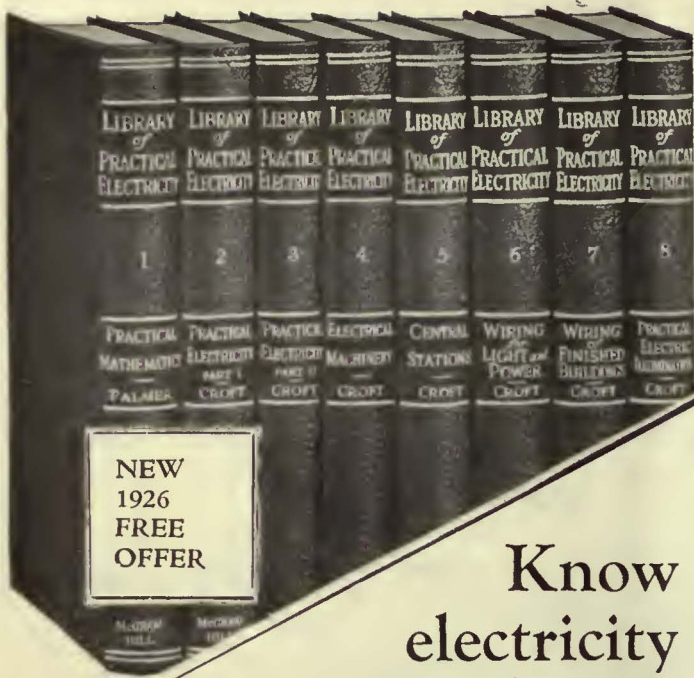
Low labor costs are just one of the by-products of the 6-Point-Service of Vitrified Paving Brick in electric railway use.

Mr. A. Taurman, Superintendent Equipment, Way and Structures for the Birmingham Electric Company, Birmingham, Alabama, says:

"—we have some brick paving which has out-lived one set of tracks and has been relaid practically as well as when the brick were new."



VITRIFIED
Brick
PAVEMENTS



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Fit yourself for one of the really big jobs by knowing electrical practice complete, including inside and outside work, central stations, and the whole subject. With the aid of the Croft books you can know electricity as experts know it and put yourself in line for an expert's pay.

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Nuttall Helical Gears for—
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We Guarantee

All Nuttall BP Gears for four times the service life of untreated gears.

Our Offer to You

Let us place a set of BP Helical Gears in your hardest service, without cost if they do not sell themselves to you.

Write us today.

R.D. NUTTALL COMPANY PITTSBURGH PENNSYLVANIA

All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Nuttall

The 1926 Edition McGRAW Electric Railway Directory

The time your salesmen can save
would pay for it many times

“Who are the men I should talk to in the Blank Railway Company?”

You'll find the answer quickly in the 1926 Edition McGraw Electric Railway Directory. Keep a copy handy—in your desk, in your brief case. You'll need it.

Call on the right men—the men who specify or buy. If your salesmen cover wide territories, they can't be expected to know all the changes in personnel of the roads they call on.

Our records showed 65% in changes

since our 1925 Edition was published.

And your mailing list. Why not *know* in advance that you are reaching the men you *need* to reach. Build and check your mailing lists from the McGraw Electric Railway Directory.

Don't waste valuable time and effort in a \$300,000,000 market by misdirecting your sales program. Save both by returning the attached coupon.

Here are the inside facts

- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico and the West Indies.
- 2—Names and addresses of officials, superintendents, department heads and purchasing agents, corrected to date of report.
- 3—Addresses of companies operating buses.
- 4—Addresses of repair shops.
- 5—Mileage of track and bus routes.
- 6—Number and kinds of cars used.
- 7—Rates of fare.
- 8—Amusement parks owned or reached.

Price \$7.50 a Copy

10% discount for five or more

Directory
Department,
Electric Rail-
way Journal,
10th Avenue and
36th St., New York,
N. Y.

Gentlemen:—Will you please send me:

.....copies of 1926 McGraw Electric Railway Directory, check for \$..... enclosed.

.....More complete information concerning contents.

Name

Company

Street

City State.....



In this railway shop, the Sullivan "WG-6" Compressor supplies air by night, while the Sullivan Angle Compound Compressor in the background handles the heavier day demand.

Don't Wait for Air

Air will be waiting—always ready if your shop is equipped with a

Sullivan "WG-6" Compressor
(capacity 68-1600 cubic feet)

This is no ordinary air compressor. Built into it are important features which will make your air power dependable and save you money in operation and upkeep.

Automatic lubrication, complete enclosure of working parts, "Wafer" valves and inlet plunger unloader are some of these features.

Let us send you complete data

Bulletin 3283-B.



"WG-6" Wafer Valve Assembly



PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

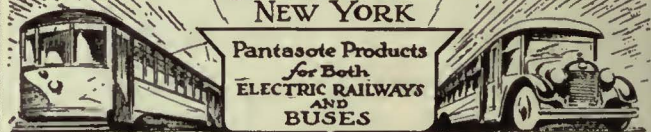
Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

The PANTASOTE COMPANY Inc.

At 46th Street 250 Park Avenue Street
NEW YORK



You're having brush trouble

CORRECT IT

USE LE CARBONE CARBON BRUSHES

They talk for themselves

COST MORE PER BRUSH
COST LESS PER CAR MILE

W. J. Jeandron

Hoboken Factory Terminal,
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.

Chicago Office: 1657 Monadnock Block

San Francisco Office: 525 Market Street

Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto



TULASI

Tulasi is a plant highly regarded by Hindu women. To walk around the tulasi 108 times with the right shoulder toward the plant is regarded as highly meritorious.

The efficacy is lost however if the left shoulder is turned toward it.

You know, it is fine training to be compelled always to do the right thing, in the right way at the right time.

In everything, even to carbon brush application, there is the right way to go about things to get results.

And there is also the left-handed way—but let's forget that because we have Morganite brushes only in mind.

If you wish to turn to the right in brush application, you don't have to beat around the bush—

Just write to



Main Office and Factory
519 West 39th St., New York

DISTRICT ENGINEERS AND AGENTS

- Pittsburgh, Electrical Engineering & Mfg. Co., 909 Penn Ave.
- Cincinnati, Electrical Engineering & Mfg. Co., 607 Mercantile Library Building.
- Cleveland, Electrical Engineering & Mfg. Co., 422 Union Building.
- Baltimore, O. T. Hall, Sales Engineer, 437-A Equitable Building.
- Revere, Mass., J. F. Drummey, 75 Pleasant Street.
- Los Angeles, Special Service Sales Co., 502 Delta Building.
- San Francisco, Special Service Sales Co., 222 Underwood Building, 545 Market Street.
- Toronto, Can., Railway & Power Engineering Corp., Ltd., 101 Eastern Ave.
- Montreal, Can., Railway & Power Engineering Corp., Ltd., 326 Craig St., West.
- Winnipeg, Can., Railway & Power Engineering Corp., Ltd., P. O. Box 325.



ACME WIRE PRODUCTS



VARNISHED INSULATIONS

THE COTTON

is woven from the very best grade of long-staple yarns.

THE SILK

is the finest selected Japanese silk we can obtain.

THE PAPER

stock is of a grade especially suitable for electrical work.

THE VARNISH

made of pure vegetable oils, is applied under accurate heat control.

THE RESULT

—very flexible insulations of wide dielectric reserve, proof against acid, oil, moisture and gases — made up in

VARNISHED CAMBRICS

VARNISHED CAMBRIC TAPES

VARNISHED SILKS AND TAPES

VARNISHED PAPERS

VARNISHED TUBING

Write our nearest office for catalog 3-J.

The Acme Wire Co., New Haven, Conn.

Branches at

- New York, 52 Vanderbilt Ave.
- Boston, 80 Federal St.
- Chicago, 427 West Erie St.
- Cleveland, Guardian Bldg.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of
Water Tube Boilers
of continuing reliability

Makers of Steam Superheaters
since 1898 and of Chain Grate
Stokers since 1893



BRANCH OFFICES

BOSTON, 49 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., 2001 Magnolia Building
HONOLULU, H. T. Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building

BRANCH OFFICES

DETROIT, Ford Building
NEW ORLEANS, 344 Camp Street
HOUSTON, TEXAS, 1011-13 Electric Building
DENVER, 444 Seventeenth Street
SALT LAKE CITY, 405-6 Kearna Building
SAN FRANCISCO, Sheldon Building
LOS ANGELES, 404-6 Central Building
SEATTLE, L. C. Smith Building
HAVANA, CUBA, Calle de Aguiar 104
SAN JUAN, Porto Rico, Royal Bank Building

WORKS
Bayonne, N. J.
Barberton, Ohio

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 Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago New York	Boston Cleveland	Pittsburgh Denver
San Francisco	U. S. Steel Products Co. Los Angeles	Portland Seattle

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.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York

BRANCH OFFICES

Munsey Bldg., Washington, D. C. 100 Boylston St., Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.

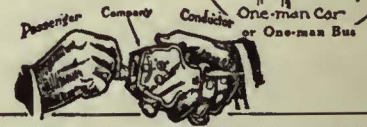
RAILWAY SUPPLIES

Tool Steel Gears and Pinions	Ft. Pitt Spring & Mfg. Co., Springs
Anglo-American Varnish Co., Varnishes, Enamels, etc.	Flaxinum Insulation
National Hand Hoists	Anderson Slack Adjusters
Genesco Paint Oils	Economy Electric Devices Co., Power Saving and Inspection Meters
Dunham Hopper Door Device	Yellow Coach Mfg. Company— Single and Double-deck Buses
Garland Ventilators	
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Instantaneous Registration by the Passenger

ROOKE of fare collection— SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register portable or stationary, at option. Handles nickels, dimes, quarters, or metal tickets, in any combination, FLEXIBILITY with CERTAINTY.



Rooke Automatic Register Company Providence, R. I.



Type R-11
Double Register

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.

The International Register Co.

15 South Throop Street, Chicago, Illinois



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:

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Export Representative: United States Steel Products Co., 30 Church Street, New York.

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

Catalog Sent on Request

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

BETHLEHEM

BUDA

ESTABLISHED 1881


Special Track Work of every description

THE BUDA COMPANY

Harvey (Suburb Chicago) Illinois

Tisco Manganese Steel in trackwork, introduced by Wharton in 1894, is still the superior metal for long life under severest railway service.

WILLIAM WHARTON JR. & CO., Inc.
Easton, Penna.



AN IRON THAT RESISTS RUST-ACID-CORROSION

So much so, in fact, that it is used for nitric acid containers, turbine buckets, blades, coal mine equipment, marine hardware, and sporting goods.

DELHI TOUGH IRON

Is worthy of your investigation.
May we send you the facts?

LUDLUM STEELS
SPECIAL PURPOSE
LUDLUM STEEL COMPANY
WATKINSVILLE - N. Y. - U. S. A.

-Carnegie-

the name to look for on Steel

CARNEGIE STEEL COMPANY
PITTSBURGH - PENNA.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta	Chicago	Cleveland	New York
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Los Angeles	Portland	San Francisco	Seattle
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United States Steel Products Company, New York, N. Y.

"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



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



Can. Rep.: Engineering Materials Limited, Montreal.
Cuban Rep.: Victor G. Mendoza Co., Havana.

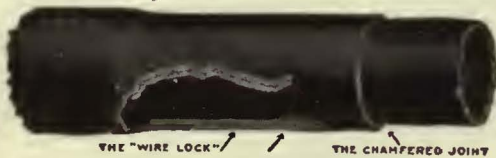
Hubbard and COMPANY

PITTSBURGH • OAKLAND, CAL. • CHICAGO



{ The Hardware makes the line }
Hubbard makes the Hardware

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

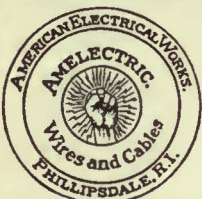
New York City, 30 Church Street

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.



AMELECTRIC PRODUCTS

BARE COPPER WIRE AND CABLE
TROLLEY WIRE
WEATHERPROOF WIRE AND CABLE
PAPER INSULATED UNDERGROUND CABLE
MAGNET WIRE

Reg. U. S. Pat. Office

Incandescent Lamp Cord

AMERICAN ELECTRICAL WORKS
PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 20-32 West Randolph Street;
Cincinnati, Traction Bldg.; New York, 100 E. 42nd St.

THE WORLD'S STANDARD

"IRVINGTON"

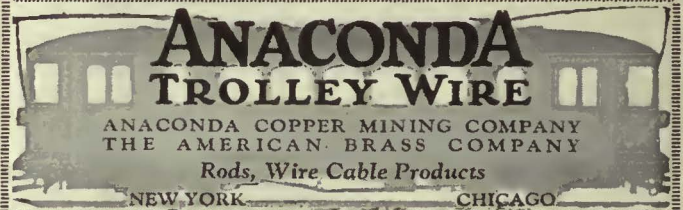
Black and Yellow
Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation Flexible Varnished Tubing
Insulating Varnishes and Compounds

Irvington Varnish & Insulator Co.
Irvington, N. J.

Sales Representatives in the Principal Cities

Chapman
Automatic Signals
Charles N. Wood Co., Boston



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.

NACHOD & UNITED STATES SIGNAL CO., INC.

LOUISVILLE, KY.

BLOCK SIGNALS

FOR

ELECTRIC RAILWAYS
HIGHWAY CROSSING SIGNALS



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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).

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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.

E R J

“SEARCHLIGHT”

Opportunity Advertising

—to help you get what you want. —to help you sell what you no longer need.

Take advantage of it—For Every Business Want

“Think SEARCHLIGHT First”

POSITIONS WANTED

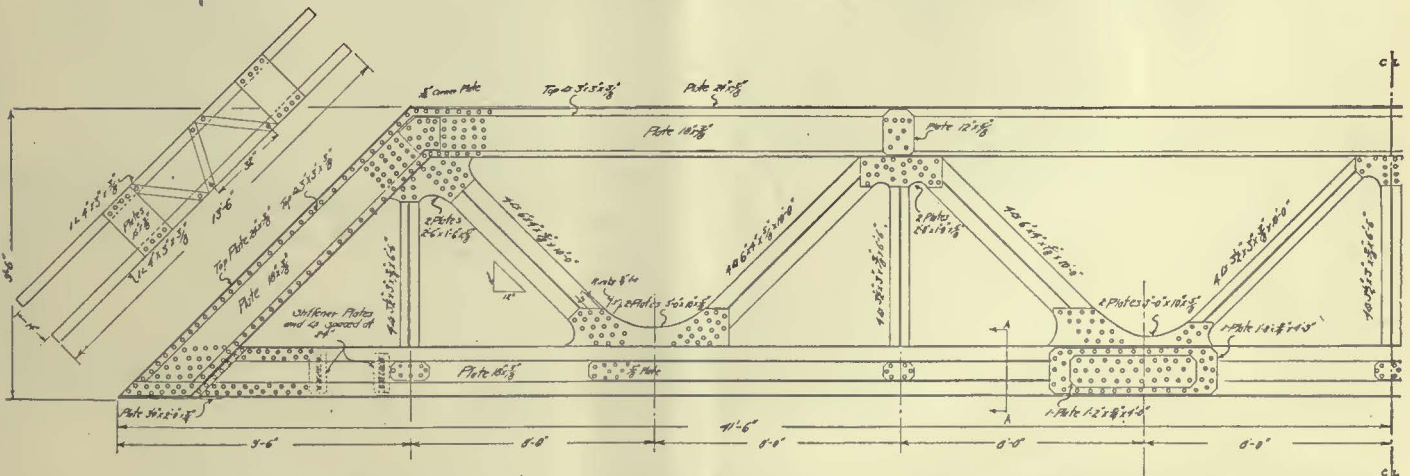
SUPERINTENDENT transportation. With a wide experience and successful record on city and interurban properties also co-ordination of rail and bus service, successful in handling labor, public relations, etc. Recognized as a transportation official of exceptional ability fully capable of getting results on any property. At present engaged. Personal reasons for desiring change. Best of references. Correspondence invited. Address PW-915, Electric Railway Journal, Guardian Building, Cleveland, Ohio.

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14 BIRNEY SAFETY CARS

Brill Built
West. 508 or G.E. 264 Motors
Cars Complete—Low Price—Fine Condition
ELECTRIC EQUIPMENT CO.
Commonwealth Bldg., Philadelphia, Pa.

Exceptional opportunity to obtain a **THREE TRUSS BRIDGE** Through-Span if you act at once—phone! wire!



FACTS ABOUT BRIDGE

Formerly used as approach span to Chicago River, Randolph Street Bridge.
Estimated capacity 150 tons live load per truss.
Suitable for heavy traffic, street cars, etc.
Length 83 feet. Width 52 feet.
Double roadway and bracketed footway.
In excellent condition.

This bridge will be sold, on bid, per ton price, f.o.b. Chicago. The first reasonable offer will be accepted. Somewhere there is need for just this type of bridge for replacement or where new road construction is in progress. This span was removed to make way for greater traffic facilities. It is ready for shipment now. Can be inspected at our yards. Write or wire for more details.

Phone: Monroe 3232

W. J. NEWMAN CO. 19 N. Curtis St., Chicago, Ill.

Advertising, Street Car
Coiller, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.
Air Springs
Cleveland Pneumatic Tool
Co.

Anchors, Guy
Elec. Service Supplies Co.
Graybar Electric Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

**Automatic Return Switch
Stands**
Ramapo Ajax Corp.

**Automatic Safety Switch
Stands**
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Illinois Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbitt Metal
Johnson & Co., J. R.

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Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
National Carbon Co.
Nichols Lantern Co.

Bearings and Bearing Metals
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

**Bearings, Center and Roller
Side**
Stueckl Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.
Graybar Electric Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Cummings Car & Coach Co.
Lang Body Co., The

**Body Material, Haskelite and
Plywood**
Haskelite Mfg. Corp.

Bolters
Babcock & Wilcox Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Elec. Service Supplies Co.

Bonding Apparatus
American Steel & Wire Co.
Elec. Service Supplies Co.

Bus
Elec. Service Supplies Co.
Graybar Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Electric Railway Improvement
Co.

Bus
Elec. Service Supplies Co.
General Electric Co.
Graybar Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Book Publishers
McGraw-Hill Book Co.

**Brackets and Cross Arms
(See also Poles, Ties,
Posts, Etc.)**
American Bridge Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Graybar Electric Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
American Brake Shoe &
Foundry Co.
Brill Co., The J. G.

**Brakes, Brake Systems and
Brake Parts**
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Brick, Paving
National Paving Brick
Mfgs. Assn.

Brick, Vitrified
National Paving Brick
Mfgs. Assn.

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

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co., Inc.
National Carbon Co.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co., Inc.
National Carbon Co.

Brushes, Metal Graphite
National Carbon Co.

Buildings, Steel
American Bridge Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Bus Seats
Haie-Kilburn Co.

Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
Garford Motor Truck Co.
International Motor Co.
Mack Trucks, Inc.

**Bushings, Case Hardened
& Manganese**
Brill Co., The J. G.

**Cables. (See Wires and
Cables)**
Cambrie Tapes, Yellow and
Black Varnish
Irvington Varnish & Ins.
Co.

**Carbon Brushes (See
Brushes, Carbon)**
Carbon Paste, Welding
National Carbon Co.

Carbon Plates, Welding
National Carbon Co.

Carbon Rods, Welding
National Carbon Co.

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.

Differential Steel Car Co.
Cars, Gas, Rail
Brill Co., The J. G.

**Cars, Passenger, Freight,
Express, etc.**
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

**Castings, Gray Iron and
Steel**
American Bridge Co.
American Steel Foundries
Wm. Wharton, Jr. & Co.

**Catchers and Retrievers,
Trolley**
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.
Graybar Electric Co.

Celling Car
Haskelite Mfg. Corp.
Pantasote Co., Inc.

Ceilings, Plywood, Panels
Haskelite Mfg. Corp.

Cement Products
Portland Cement Association

Change Carriers
Cleveland Fare Box Co.
Elec. Service Supplies Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

**Clamps and Connectors for
Wires and Cables**
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Cleaners and Scrapers Track
(See also Snow-Plows,
Sweepers and Brooms)**
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

**Coil Banding and Winding
Machines**
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Colls, Armature and Field
General Electric Co.
Westinghouse E. & M. Co.

Colls, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

Coin Counting Machines
Cleveland Fare Box Co.

Coin Registering Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Electrical Mfg. Co.
General Electric Co.
Westinghouse E. & M. Co.

Compressors, Air
General Electric Co.
Graybar Electric Co.
Sullivan Machinery Co.
Westinghouse Tr. Br. Co.

Compressors, Gas
Sullivan Machinery Co.

Compressors, Portable
Sullivan Machinery Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condenser Papers
Irvington Varnish & Ins.
Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
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 Ma-
chinery**
American Bridge Co.

Copper Wire
American Brass Co.
Amer. Steel & Wire Co.
Anaconda Copper Mining
Co.

**Copper Wire Instruments,
Measuring, Testing and
Recording**
American Brass Co.
American Steel & Wire Co.
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register
Amer. Steel & Wire Co.
Brill Co., The J. G.
Elec. Service Supplies Co.
International Register Co.
Roebbling's Sons Co.
John A.

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.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes, Hoists & Lifts
Elec. Service Supplies Co.

Cross Arms (See Brackete)

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.

Curtains & Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc.

**Dealer's Machinery & Second
Hand Equipment**
Elec. Equipment Co.
Newman Co., W. J.

Dealer Second Hand Rails
Electric Equipment Co.

**Derailing Devices (See also
Track Work)**
Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Elec. Service Supplies Co.

Detective Service
Wish-Service, P. Edward

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
Nat'l Pneumatic Co., Inc.

Doors & Door Mixtures
Brill Co., The J. G.
General Electric Co.
Haie-Kilburn Co.
Morton Mfg. Co.

Doors, Folding Vestibule
Nat'l Pneumatic Co., Inc.

Drills, Rock
Sullivan Machinery Co.

Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Ears
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Graybar Electric Co.
Railway Trackwork Co.
Electric Transmission Towers
American Bridge Co.

Electrical Wires and Cables
Amer. Electrical Works
Amer. Steel & Wire Co.
Graybar Electric Co.
John A. Roebbling's Sons Co.

Electrodes, Carbon
Railway Trackwork Co.

Una Welding & Bonding Co.
Electrodes, Steel
Railway Trackwork Co.

Una Welding & Bonding Co.
Engineers, Consulting, Con-
tracting and Operating
Allison & Co., J. S.
Archbold-Brady Co.
Beeler, John A.
Buchanan & Layng Corp.
Bylleby & Co., H. M.
Day & Zimmermann, Inc.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelker & DeLew
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The
J. G.

Engines, Gas, Oil or Steam
Westinghouse E. & M. Co.

Exterior Slide Panels
Haskelite Mfg. Corp.

Fare Boxes
Cleveland Fare Box Co.
Nat'l Ry. Appliance Co.
Percy Mfg. Co.

Fare Registers
Elec. Service Supplies Co.

**Fences, Woven Wire and
Fence Posts**
Acme Wire Co.
Amer. Steel & Wire Co.
Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co.
St. Louis Car Co.
Star Brass Works
Wood Co., Chas. N.

Fibre and Fibre Tinting
Westinghouse E. & M. Co.

Field Colls (See Colls)

Flangeway Guards, Steel
W. S. Godwin Co., Inc.

Flashlights
National Carbon Co.

Flaximum Insulators
National Railway Appliance
Co.

Floodlights
Elec. Service Supplies Co.

Floor, Sph
Haskelite Mfg. Corp.

Floors
Haskelite Mfg. Corp.

Foreings
Brill Co., The J. G.
Carnegie Steel Co.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Frogs, Track (See Track
Work)**

Frogs, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

**Furnaces, Electric, Steel
Melting**
American Bridge Co.

Funnel Castings
Wm. Wharton, Jr. & Co.

Fuses and Fuse Boxes
Consolidated Car Heating Co.
General Electric Co.
Graybar Electric Co.
Westinghouse E. & M. Co.

Fuses, Refillable
General Electric Co.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.
Westinghouse E. & M. Co.

Gas Producers
Westinghouse E. & M. Co.

Gates, Car
Brill Co., The J. G.

Gauges, Oil and Water
Ohio Brass Co.

Gear Blanks
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.

Gear Cases
Chillingworth Mfg. Co.
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Gears and Pinions
Bethlehem Steel Co.
Elec. Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.

Generating Sets, Gas-Electric
General Electric Co.

Generators
General Electric Co.
Westinghouse E. & M. Co.

Girders, Rail
Bethlehem Steel Co.
Lorain Steel Co.

Gongs (See Bells and Gongs)

Greases (See Lubricants)

Grinders & Grinding Supplies
Metal & Thermit Corp.
Railway Trackwork Co.

Grinders, Portable
Railway Trackwork Co.

Grinders, Portable Electric
Railway Trackwork Co.

Grinding Bricks and Wheels
Railway Trackwork Co.

Guard Rail Clamps
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

**Guard Rails, Tee Rail &
Manganese**
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Guards, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.

Harps, Trolley
Elec. Service Supplies Co.
Nuttall Co., R. D.
Star Brass Works

Headlights
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskelite Mfg. Corp.
Pantasote Co., Inc.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heat. & Ltg. Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter

**Heaters, Car, Hot Air and
Water**
Smith Heater Co., Peter

Heaters, Car Stove
Smith Heater Co., Peter

Helmets, Welding
Railway Trackwork Co.
Una Welding & Bonding Co.

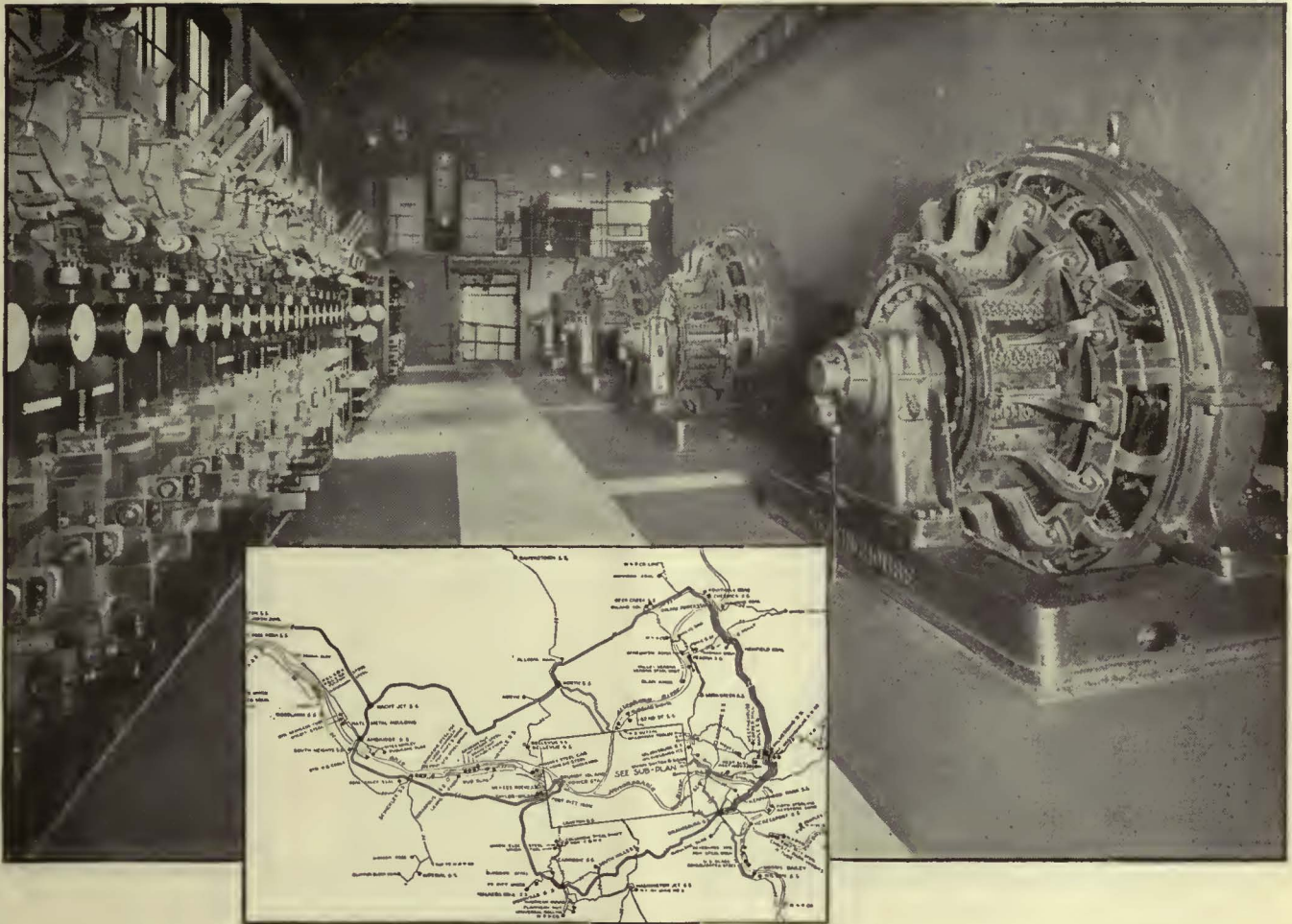
Hoists, Portable
Sullivan Machinery Co.

Hose, Bridges
Ohio Brass Co.

Hose, Pneumatic
Westinghouse Traction
Brake Co.

**Instruments Measuring, Test-
ing and Recording**
Amer. Steel & Wire Co.
General Electric Co.
Graybar Electric Co.
Westinghouse E. & M. Co.

(Continued on page 42)



Pittsburgh's Power Through NCC Pyramids

IN THE Pittsburgh district, the Duquesne Light Company provides lights and power to hundreds of thousands of industrial plants and homes. It serves an area of a thousand square miles, containing 182 busy municipalities. No factor which contributes to the assurance of 100 per cent reliability has been overlooked, for interruption would mean disruption in this most active industrial district.

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357 West 36th St.
Phone: Lackawanna 8153

BIRMINGHAM, ALA.
1824 Ninth Ave. N.
Phone: Main 4016

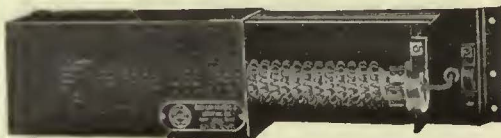
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Irvington Varnish & Ins. Co.
Okonite-Callender Cable Co.
United States Rubber Co.
Westinghouse E. & M. Co.
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Irvington Varnish & Ins. Co.
- Insulating Varnishes**
Irvington Varnish and Insulator Co.
- Insulation (See also Paints)**
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Elec. Service Supplies Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Okonite-Callender Cable Co.
Westinghouse E. & M. Co.
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Irvington Varnish & Ins. Co.
- Insulator Pins**
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General Electric Co.
Graybar Electric Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
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- Interurban Cars (See Cars)**
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National Ry. Appliance Co.
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Westinghouse E. & M. Co.
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Nichols-Lintern Co.
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Cleveland Tanning Co.
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Electric Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
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- Manganese Steel Guard Rails**
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Wm. Wharton, Jr. & Co.,
- Manganese Steel, Special Track Work**
Bethlehem Steel Co.
Wm. Wharton, Jr. & Co.,
- Manganese Steel Switches, Frogs and Crossings**
Bethlehem Steel Co.
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Wm. Wharton, Jr. & Co.,
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General Electric Co.
Westinghouse E. & M. Co.
- Motorman's Seats**
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Wood Co., Chas. N.
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Graybar Electric Co.
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Hubbard & Co.
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Omnibuses (See Buses, Motor)
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W. S. Godwin Co., Inc.
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National Paving Brick Mfgs. Assn.
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Ohio Brass Co.
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Elec. Service Supplies Co.
General Electric Co.
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Westinghouse Tr. Brake Co.
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Graybar Electric Co.
Hubbard & Co.
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International Creosoting & Construction Co.
- Poles, Ties, Posts, Piling & Lumber**
Bell Lumber Co.
International Creosoting & Construction Co.
Naugle Pole & Tie Co.
- Poles, Trolley**
Bell Lumber Co.
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Elec. Service Supplies Co.
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- Pumps, Vacuum**
Sullivan Machinery Co.
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Philip Carey Co., The
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Illinois Steel Co.
Ludlum Steel Co.
- Rail Joints—Welded**
Lorain Steel Co.
Metal & Thermit Corp.
- Rail Welding**
Metal & Thermit Corp.
Railway Trackwork Co.
Una Welding & Bonding Co.
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Hyman-Michaelis Co.
- Rails, Steel**
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Carnegie Steel Co.
Illinois Steel Co.
Ludlum Steel Co.
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Carnegie Steel Co.
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Pantaoste Co., Inc.
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Haskelite Mfg. Corp.
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St. Louis Car Co.
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Brill Co., The J. G.
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Hale-Kilburn Co.
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Hale-Kilburn Co.
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Wood Co., Chas. N.
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Brill Co., The J. G.
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Morton Mfg. Co.
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Illinois Steel Co.
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- Storage Tanks**
Bowser & Co., S. F.
- Strain Insulators**
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Westinghouse E. & M. Co.
- Strand**
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Roebling's Sons Co., J. A.
- Street Cars (See Cars, Passenger, Freight, Express)**
- Stripheaters**
Babcock & Wilcox Co.
- Sweepers, Snow (See Snow Plows, Sweepers and Rooms)**
- Switch Stands and Fixtures**
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Nichols-Lintern Co.
- Switches and Switchboards**
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- Switches, Tee Rail**
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- Switches, Track (See Track Special Work)**
- Tampers, Tie**
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Gold Car Heating & Lighting Co.
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Smith Heater Co., Peter
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Mohawk Rubber Cothe
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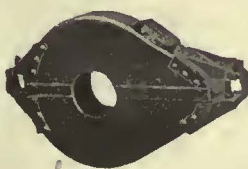
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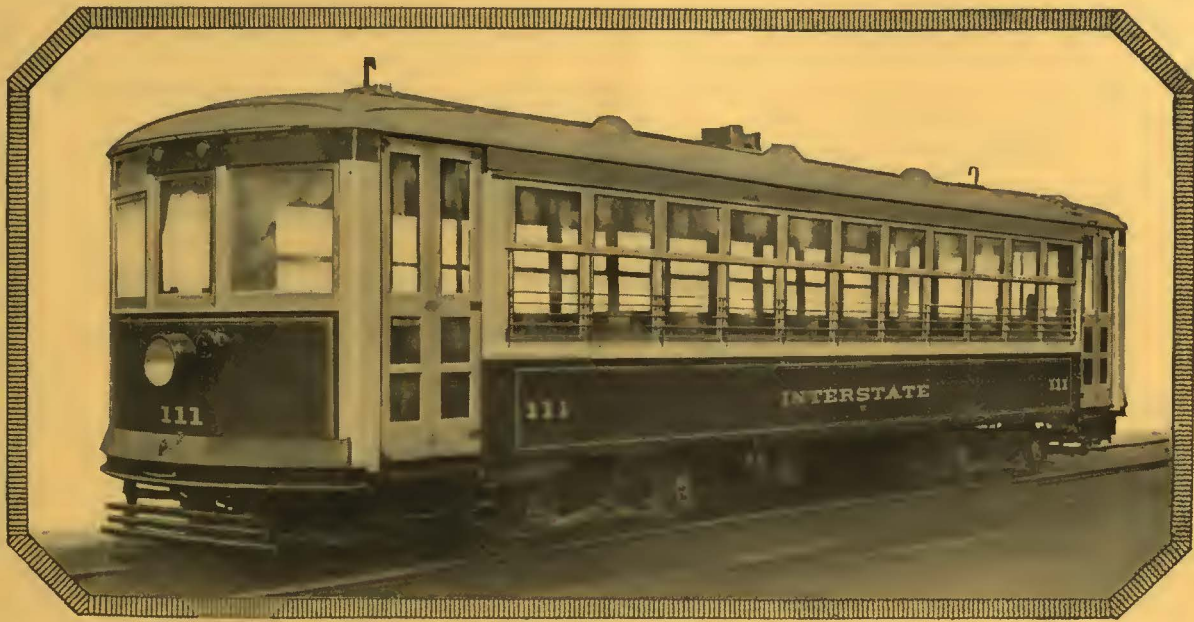
RAMAPO
RACOR

HILLBURN, NEW YORK
NIAGARA FALLS, N.Y.
CHICAGO, ILLINOIS
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ACME Window Curtain Fixtures

Noiseless — direct acting — enlarged friction surface — less parts — stronger — more easily and finely adjusted.

MORTON MANUFACTURING COMPANY
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A Profitable Investment—New Cars

Outstanding results demonstrate that the introduction of new and modern type cars affords appreciable saving in operating and maintenance expenses.

About one year ago the Interstate Street Railway, Attleboro, Mass., replaced its obsolete 45,000 lb. equipment with five 31,000 lb. double-truck and three 16,000 lb. single-truck one-man cars, all modernly equipped to meet present-day requirements.

In this particular installation economies were effected in power and the cost of conducting transportation, in addition to maintenance. These were such that the

total expense per car mile was reduced from 37.59c. to 25.9c., which when figured on an annual basis is equivalent to a 65 per cent return on the capital invested.

With such results obtainable and the purchase of new cars made easy through a liberal financial plan, it is not only desirable but possible for every electric railway to stimulate its enterprise by the introduction of new cars of the modern type.


THE J. G. BRILL COMPANY

 PHILADELPHIA, PA.
 AMERICAN CAR CO. — C.C. KUHLMAN CAR CO. — WASON MAN'G CO.
 ST. LOUIS, MO. — CLEVELAND, OHIO. — SPRINGFIELD, MASS.

Enthusiasm grows for the Gas-Electric Bus

Albany says:

"The Gas Electric Bus has passed beyond the experimental stage with our company"

Part of statement by H. B. Weatherwax, vice president United Traction Company, Albany, N. Y. A subsidiary company, The Capital District Transportation Company operates gas-electric buses.

Mr. Weatherwax went even further and stated that the gas-electric bus tested out in this company's service "*thoroughly proved its superiority over other types for the work*"

Then eighteen more were ordered, all of which have been in service several months.

These buses regularly negotiate the long Capitol Hill, on State Street, with a grade varying from 7½% to 9%, and Arbor Hill which has even a steeper grade. They

are making a schedule speed of 11.21 miles per hour exclusive of lay over. These average schedules are 20% faster than with other types of buses previously operated.

The electric brake is used on every trip descending these grades and has been found a very important asset.

No wonder that Albany officials are enthusiastic about electric drive and that more Gas-Electrics have been ordered for other parts of the system.



First in the field with a commercially practical electric drive for buses, General Electric has since acquired experience that is invaluable. G-E equipment, in operation today on buses from coast to coast, is the recognized standard

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