

ELECTRIC RAILWAY JOURNAL

On Timken Bearings

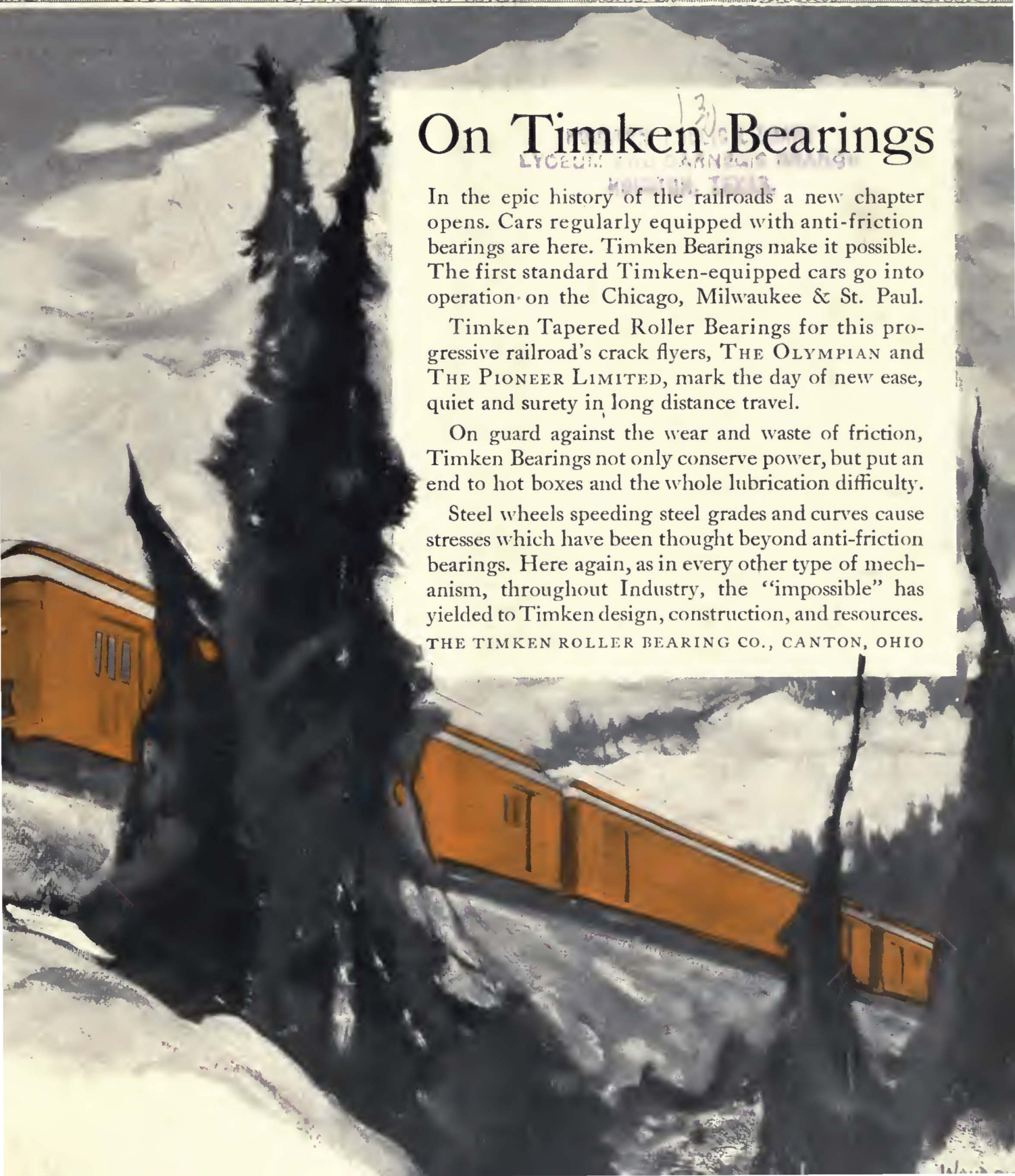
In the epic history of the railroads a new chapter opens. Cars regularly equipped with anti-friction bearings are here. Timken Bearings make it possible. The first standard Timken-equipped cars go into operation on the Chicago, Milwaukee & St. Paul.

Timken Tapered Roller Bearings for this progressive railroad's crack flyers, THE OLYMPIAN and THE PIONEER LIMITED, mark the day of new ease, quiet and surety in long distance travel.

On guard against the wear and waste of friction, Timken Bearings not only conserve power, but put an end to hot boxes and the whole lubrication difficulty.

Steel wheels speeding steel grades and curves cause stresses which have been thought beyond anti-friction bearings. Here again, as in every other type of mechanism, throughout Industry, the "impossible" has yielded to Timken design, construction, and resources.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO





Protection

— against
extreme conditions

TO shoot through the clouds, a hundred miles an hour or more, the aviator needs special protective dressing—ordinary clothes won't do.

Railway motors also operate under conditions that call for more than "save-the-surface" varnish for insulation.

To effectually resist the vibration, the moisture and the extremes of heat and cold, the insulating varnish must have special characteristics. Westinghouse varnish No. 335 has those characteristics. This special varnish is an important factor in Westinghouse motor performance. Keep it on hand for any motor insulation that may become necessary from time to time. You can buy it by the can.

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

TOUGHER THAN
RHINOCEROS HIDE



Westinghouse

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Ripley's Riddle Answered

DESPITE the allegations by Professor Ripley that annual reports of public utility companies unravel more blue ribbon than financial mysteries, many pertinent facts on the operating end of the railway business are contained in these statements. Besides the usual data on revenues, expenses and traffic in the president's address to the stockholders is included also a review of the year's activities—how the bus developed business in previously unserved territory; how track extensions were made; new equipment purchased and how new financing was accomplished. In these reports the reader will find interesting records of public relations policies, customer ownership, employee welfare work and safety first measures. Moreover, the company's plans for the coming year often are laid before the shareholders.

A few of these reports for the year ended Dec. 31, 1926, have already been reviewed in ELECTRIC RAILWAY JOURNAL and at least one will be abstracted in each week's issue for the next few months. From them many illuminating facts can be gleaned about electric railways operating in this country and abroad.

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 SAVING THE RAIL SAVES THE RAILWAY

Now widely appreciated—

Comfortable, attractive, efficient cars have proved their value as traffic stimulators, but the idea that such cars alone are a cure-all is now widely appreciated. Almost every week some able railwayman records the opinion that cars, new or old, can be neither comfortable nor efficient unless operated on smooth, well-maintained track. We quote another—Mr. W. R. McRae, Supt. Rolling Stock and Shops, Toronto Transportation Commission:

“A smooth and well-maintained track is a most important factor in easy riding quality of the car and systematic maintenance and inspection are necessary.”

It certainly seems logical to take the first step first—provide smooth comfortable track. It will make even your old cars ride better.

Here is equipment for economical rail grinding and welding.

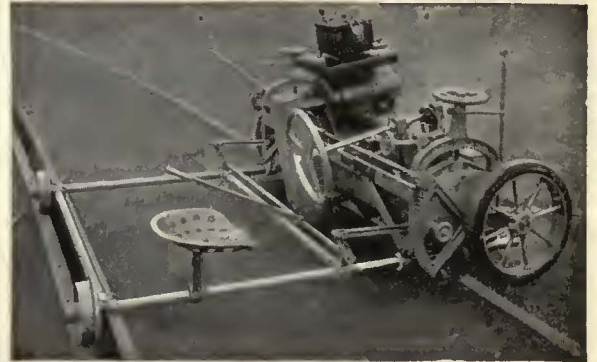
*Bulletins?
Quotations?
Both?*

Railway Trackwork Co.

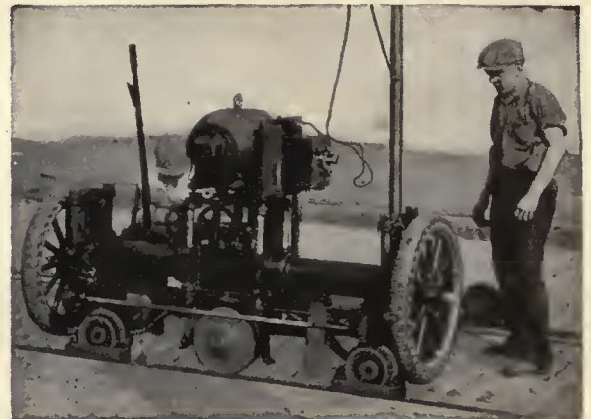
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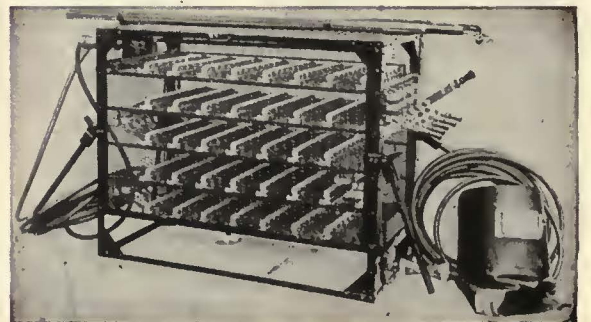
“Improved Atlas” Rail Grinder



“Imperial” Track Grinder



Reciprocating Track Grinder



“Ajax” Electric Arc Welder

O.S.T.—1594

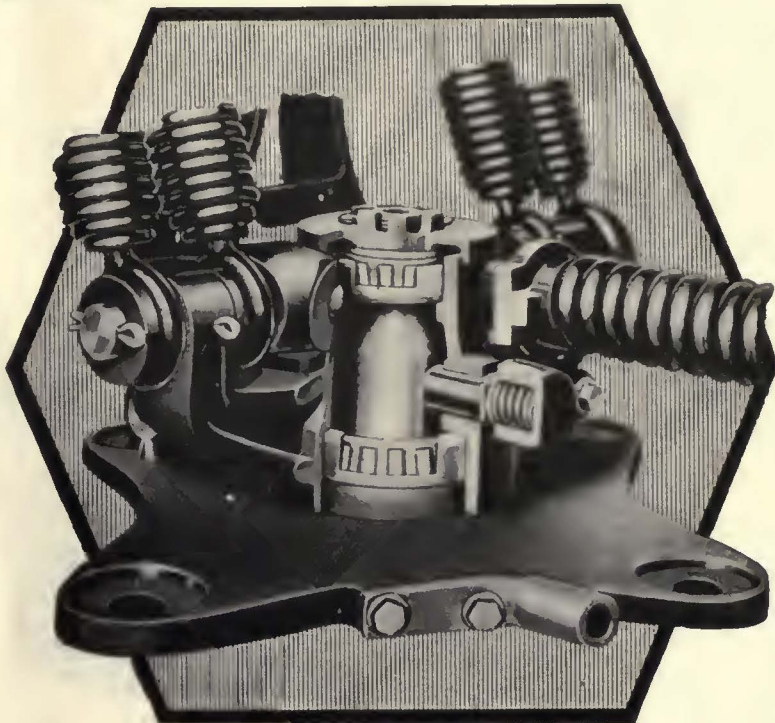
 SAVING THE RAIL SAVES THE RAILWAY

Position when "hold down" latch is engaged, ready for changing of pole. Overall height 6½-in.



O-B assembly of Timken Bearings, and phosphor bronze contact for shunting the current.

Light, compact, and sturdy, the Form 4 Base is ideal for all classes of service.



Floating on Timkens —

THE weight of the turret assembly, trolley pole, trolley wheel and harp, as well as the thrust load which results from the pressure of the trolley wire, is *floating* on Timkens.

This *floating principle*, which the O-B application of Timken Tapered Roller Bearings exemplifies, does more than distribute the load uniformly. It minimizes friction and wear, insures permanent alignment, gives you a trolley base that swings true and free indefinitely.

Nothing could be simpler, yet so completely effective. It is one of the features of the O-B Form 4 Trolley Base that has made possible new low records in cost of maintenance.

Packed in cup grease and fully protected against dirt and weather by the turret housing, the bearings are practically unaffected by length of service.

May we send you Folder 48C which explains this and other features in detail? Address

Ohio Brass Company, Mansfield, Ohio
 Dominion Insulator & Mfg. Co., Limited
 Niagara Falls, Canada
 330C

Ohio Brass Co.

SALES OFFICES: NEW YORK CHICAGO PHILADELPHIA PITTSBURGH CLEVELAND SAN FRANCISCO LOS ANGELES

PORCELAIN INSULATORS
 LINE MATERIALS
 RAIL BONDS
 CAR EQUIPMENT
 MINING MATERIALS
 VALVES

LONG LIFE



“**O**LD TIMERS” enjoy giving reasons for their long life. “Never touched tobacco,” says one. “Smoked all my life,” says another. The reasons are as varied as the individuals.

But for the long life without maintenance found in Davis “One-Wear” Steel Wheels there is a substantial reason.

A special composition, heat-treated steel gives the strength and wear resistance that makes long life possible.

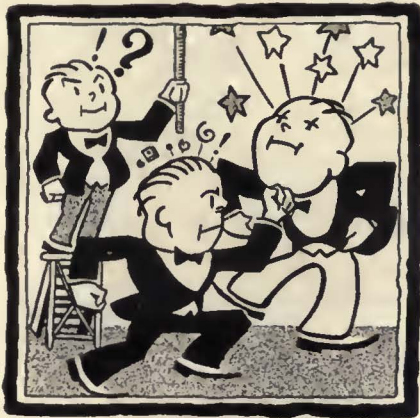
Davis Wheels are “One-Wear” Wheels by reason of their own unusual physical qualities.

AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



There was a time when people used to bait one another with such exploitation - We haven't heard whether the matter was ever settled.

And in the electric railway field there has been considerable discussion on the matter of paved track construction—whether the construction should be *rigid* or *flexible*.

The controversial nature of the discussion of various types of paved track construction and the lack of comparative data has led to certain indefiniteness of statement — amounting, in some cases, to inaccuracy:

The engineers of the International Steel Tie Company have worked out a scale of comparison ranging from *extreme flexibility* (open track-wood tie) to *extreme rigidity* (slot construction—under-

U U
A Low high is up?

ground trolley) that will eliminate confusion of these terms.

The task of building the best paved track for electric railway use is only partly accomplished after the selection or designing of the tie. It remains to adapt the tie to the rest of the structure.

The adjustment of the tie to the rest of the track structure depends on factors often overlooked, i.e., the coefficient of expansion and contraction of *all* the materials entering into the structure—again the comparative normal life of those same materials.

This data is included in our new Paved Track Notebook. Engineers and executives should be sure to have this book—If you haven't received your copy, be sure to send for it.

The International Steel Tie Co.

Cleveland, Ohio

20% more bearing surface
steel **U U** win **U U** tie track

WESTINGHOUSE "VARIABLE LOAD" BRAKE



STABILIZED STOPABILITY throughout the entire range of car-loading means—

—safe and swift car movement, through congested districts;

—ability to hold traffic position with other moving vehicles, inasmuch as peak speed can be held longer between stops;

—a precise and systematic movement of shopping and business crowds;

—seconds saved, that may collectively be counted as dollars;

—stimulation of public good will, through a gratifying on schedule record over the entire system.

Many traction companies, recognizing the auspicious part Westinghouse Variable Load Brakes can play in effecting these far-reaching advantages, are specifying this new type equipment for their new modern light weight cars.

Westinghouse Traction Brake Company
General Offices and Works: Wilmerding, Pa.

gives
Uniform Braking
with
Varying Load

Information regarding Westinghouse Variable Load Brakes may be obtained upon application to our nearest district office—

Ask for Descriptive Catalogue T-2045.



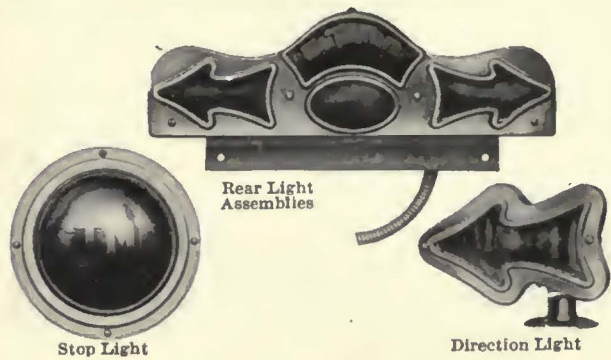
WESTINGHOUSE TRACTION BRAKES



"Tell the public where you're going"

Hunter Illuminated Bus Signs

Made with roller curtains that permit ten or more destination names. Make easy the quick re-routing of buses. They advertise your service and establish your routes. Use them to "Tell the Public Where You're Going."



Stop Light

Rear Light Assemblies

Direction Light

Keystone Rear Lights

Well-designed stop lights, directional lights and complete rear light assemblies make for safer driving at night. They are an added protection for passengers and equipment.



Dome Type



Pendant Type

Keystone-Ivanhoe Lighting Fixtures

Scientifically designed to provide ample and steady illumination in every part of the bus.



Faraday Passenger Signal Systems

Convenient push-button and buzzer systems enable passengers to signal driver. Various styles made to meet all requirements.

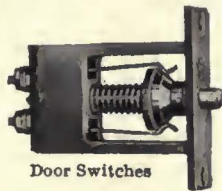
Faraday Signal System Accessories

Door switches are for indicating "open" or "closed" door and for operating step lights.

Conductors Signal Keys used on 2 man buses to signal driver. Other types for similar uses.



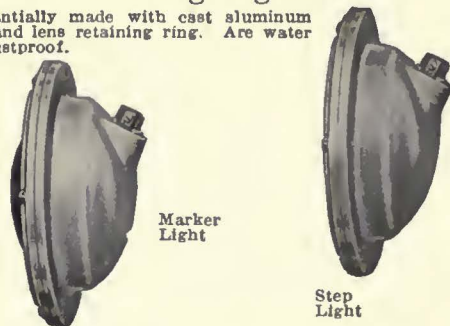
Conductor's Signal Switches



Door Switches

Keystone Running Lights

Substantially made with cast aluminum body and lens retaining ring. Are water and dustproof.



Marker Light

Step Light

Golden Glow Headlights



Designed to project powerful and well concentrated beams of light—yet they eliminate the glaring and dazzling effect by means of a greenish-yellow glass reflector which absorbs the blinding violet and blue rays. Reflector will never tarnish nor deteriorate. Adds safety to night travel.



Catalog No. 9
Send for your copy

ELECTRIC SERVICE SUPPLIES Co

Manufacturers

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PITTSBURGH Bessemer Building BOSTON 88 Broad St. SCRANTON 316 N. Washington Ave. DETROIT General Motors Bldg.
Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver

Safeguard and Accelerate Traffic

Automatic Signals by providing proper spacing of cars or trains, reduce trip time and enable more cars to be operated with consequent safety.

Interlocking installations at terminals and at grade crossings eliminate unnecessary stops and assure route continuity by means of signal indications.

Highway crossing protective devices of the flashing light, automatic flagman, or audible type, or combination of same, are a dependable insurance which soon pays off the investment.

Power operated remotely controlled switches are being used economically to accelerate Electric Railway traffic.

These Systems are products of the



Union Switch & Signal Co.



SWISSVALE, PA.



P.R.T.

buys

200 MORE

YELLOW COACH

GAS ELECTRICS



Mitten Management

Never Guesses

Again P.R.T. repeats on Yellow Coaches.
Again P.R.T. reviews its experience with
Yellows and expresses its confidence in
Yellow Coach equipment by ordering
200 more—

100 Single Deck Gas Electrics

50 Double Deck Gas Electrics

50 Parlor Car Gas Electrics

Four Times Has P.R.T. Made a Similar Decision

Four times has Mitten Management analyzed the performance of its Yellow Coaches from every possible operating and economy angle. And each time Yellow Coaches have furnished the only logical answer.

Originally P.R.T. bought 10 Yellow "Type Z" Double Deckers.

On December 20, 1924 they repeated with 125 "Type Z" Double Deckers, 75 Single Deck and 4 Parlor Cars of the Gas Electric type.

Again a year later, more Yellow Coaches were ordered—25 "Type Z" Gas Electrics, purchased December 17, 1925.

Last February, when more equipment was needed, history repeated itself. Practical experience pointed to Yellow Coaches and *again* on February 15, 1926, P.R.T. bought 75 "Type Z" 6-cylinder Gas Electric Double Deckers and 62 "Type Z" Gas Electric Single Decks.

and **NOW—**

200 More!



Mitten Management, wherever it operates, knows by experience the value of Yellow Coach performance.

In Buffalo, also, orders for Yellow Coaches have been repeated again and again. For example:

The first order, December 30, 1925, was for 4 Yellow Gas Electric Parlor Coaches and 7 Gas Electric "Type Z" Single Decks.

Again 14 Gas Electric Single Deck "Type Z" Yellow Coaches were ordered on June 9, 1926.

AND NOW—

24 More!

14 Gas Electric Single Deck "Type Z" Yellow Coaches

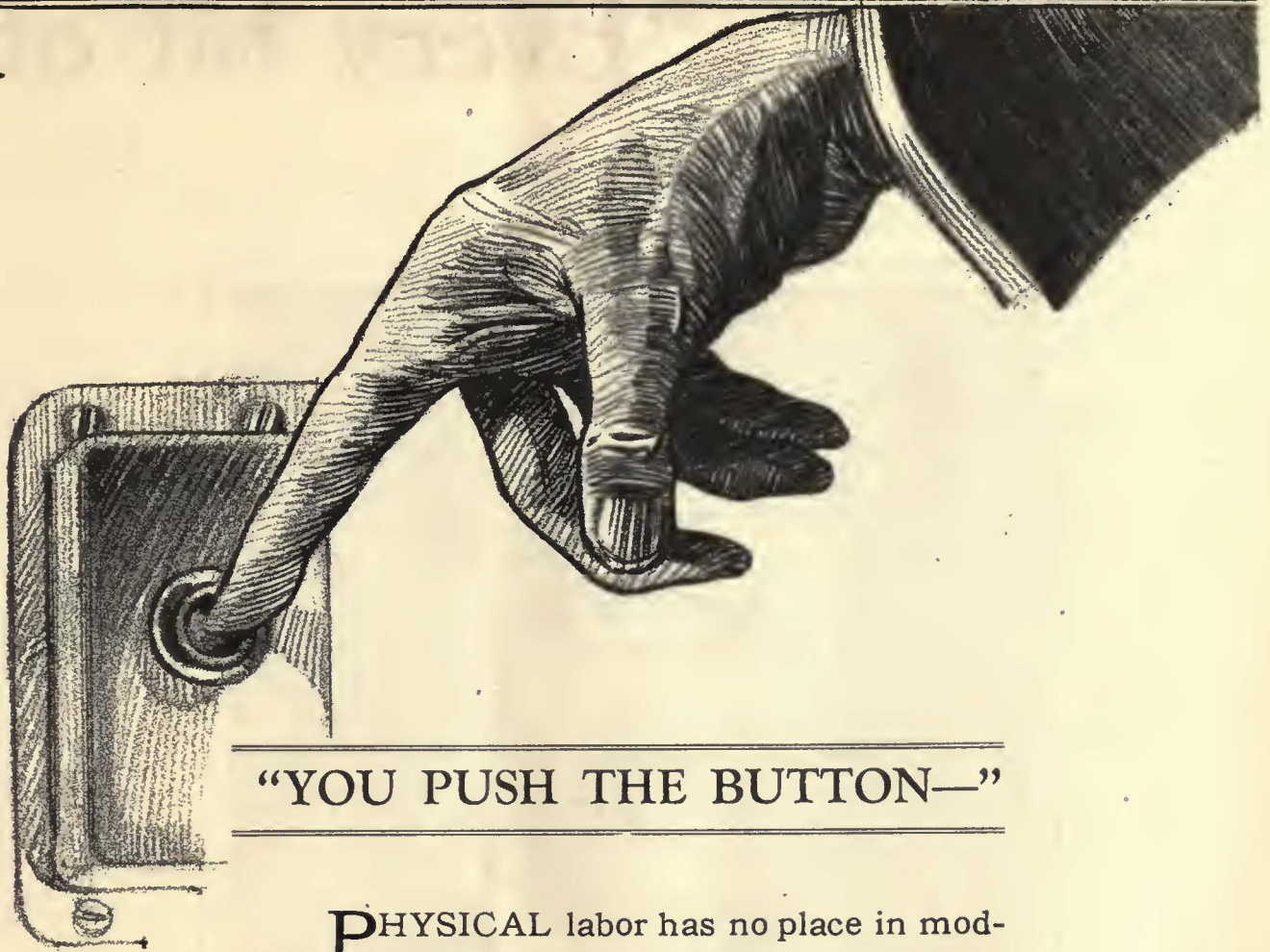
10 Yellow Gas Electric Parlor Cars.

Mitten Management Never Guesses. It buys on the proved basis of past performance.

It buys *Yellow Coaches!*



YELLOW TRUCK & COACH MANUFACTURING CO.
SUBSIDIARY GENERAL MOTORS CORPORATION
5801 WEST DICKENS AVENUE, CHICAGO, ILL.



“YOU PUSH THE BUTTON—”

PHYSICAL labor has no place in modern operation. In cars equipped with National Pneumatic Door and Step Controlling Mechanisms, the car man does not have to reach for or to struggle with door handles and door operating levers. He simply pushes a button and the National Pneumatic Engine does the rest.

NATIONAL PNEUMATIC COMPANY

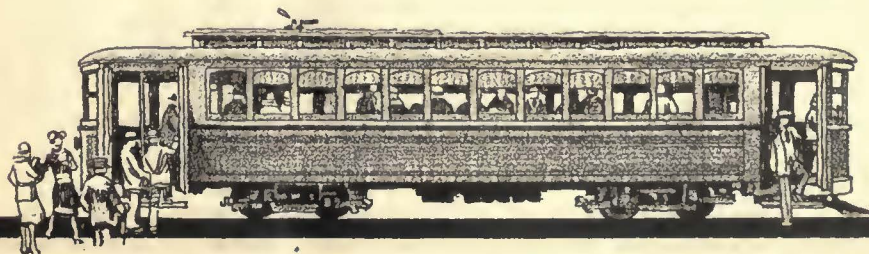
Executive Office: 50 Church Street, New York

General Works: Rahway, New Jersey

CHICAGO
518 McCormick Building

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

PHILADELPHIA
1010 Colonial Trust Building



“Every bit of



Harry Etheridge, Vice President and General Manager of the Harmony System. Mr. Etheridge is a keen analyst of electric traction problems.

vibration is removed”

“WE worked for ten years to perfect the system of track insulation you see here,” said Mr. Harry Etheridge, Vice President and General Manager of the Harmony Railway System.

“Note the concrete blocks which support the rails. The natural tendency, you know, is for the rail to tip more to the inside than to the outside. For that reason the inside support of the cruciform tie is considerably longer than the outside one; that stabilizes the beam action and prevents the block from rocking.

“Now here’s another very important feature—the shock absorbers on which the rails rest. A recess, $\frac{3}{4}$ ” deep, 5” wide, and 55” long, is cast in the top of each concrete block. In the bottom of this groove is a soft, resilient, asphaltic pad; on top of that is a harder pad of the same material. The rail is bolted over this cushion, so that it rests its entire length on a series of pad combinations. In this way every bit of vibration is removed from the concrete.

“An extra plate on the outside, where the

rail sections join, carries wheel traffic over the gap without a jar. The tie rods, or bonds, serve a double purpose: mechanically, they hold the rails in gauge; electrically, they bond the rail joints.”

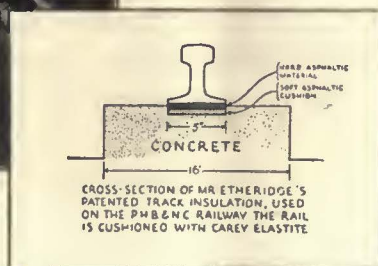
In view of the fact that ten years of investigation and experiment were needed to bring the track insulation system of the P. H. B. & N. C. Railway out of the experimental stages, Mr. Etheridge’s extensive use of Carey materials is especially significant.

The cushions used in Mr. Etheridge’s concrete blocks are of a composition similar to that used in Carey Elastite Track Insulation for paved track construction, now being used by some eighty-five railway systems.

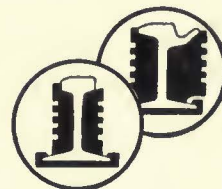
THE PHILIP CAREY COMPANY
Lockland, Cincinnati, Ohio



View on the main line of the P. H. B. & N. C. Railway, at Ziegler Station, Pennsylvania, showing the interesting stages from the wooden cross-tie to the finished track insulation system. Note first the square concrete blocks, then the tie extended toward the center of the track, and finally the cruciform ties, shown in staggered rows in the perfected system.



Carey
REGD. U.S. PAT. OFF.
Elastite
TRADE MARK REGD. U.S. PATENT OFFICE



SYSTEM OF TRACK INSULATION



Millions for
modern cars
~ ~ and ~ ~
at least a few
thousands
for modern
track to run
~ them on ~



Borden.

Modern cars must be comfortable—smooth riding—quiet—economical.

The same adjectives can be applied to modern track!

Why should the industry spend millions for new cars with these qualities, only to have them neutralized by rough-riding, noisy track, which even constant maintenance can't make modern?

Thermit welding eliminates the maintenance of joints by eliminating the joints themselves. Thermit welding makes even old track ride more smoothly and quietly. Thermit welding provides a railway track which is fit for modern cars to run on—*permanently!*

And the first cost of Thermit Welding is the last cost—it lasts as long as the rail itself.



METAL & THERMIT CORPORATION
120 BROADWAY, NEW YORK, N.Y.

PITTSBURGH

CHICAGO

BOSTON

SOUTH SAN FRANCISCO

TORONTO

BALANCED DESIGN

—and a new
viewpoint on
trucks

Competition has not been slow to develop the mechanical factors of passenger comfort. Speed, riding qualities, braking and silence have become powerful sales weapons.

Yet up till recently the design of electric railway trucks differed little from the conventional forms in use since the early days of the industry. Hard riding, noise, and inefficient brakes have formed a poor basis for ride merchandizing to a twentieth century public.

Realizing this, Cincinnati, in apply-

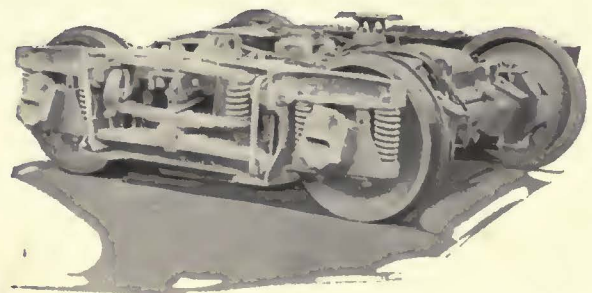
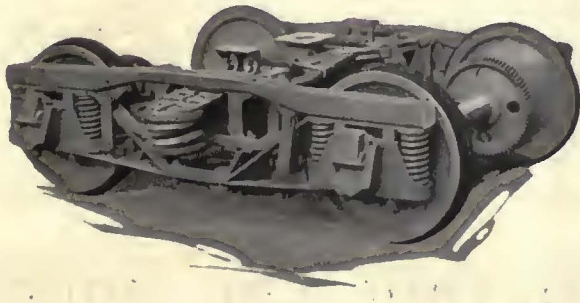
ing the principle of **BALANCED DESIGN** has made several radical improvements in truck design, notably in suspension, brake rigging and a practical application of the Duplex Air and Magnetic Brake. This may be only a first step, but it has resulted in Cincinnati **NEW** Lightweight cars showing substantial increases in schedule speed, with silence, freedom from side-sway and greatly improved riding qualities.

The facts and figures are ready for presentation to interested electric railway executives on request.

CINCINNATI CAR COMPANY
Cincinnati, Ohio

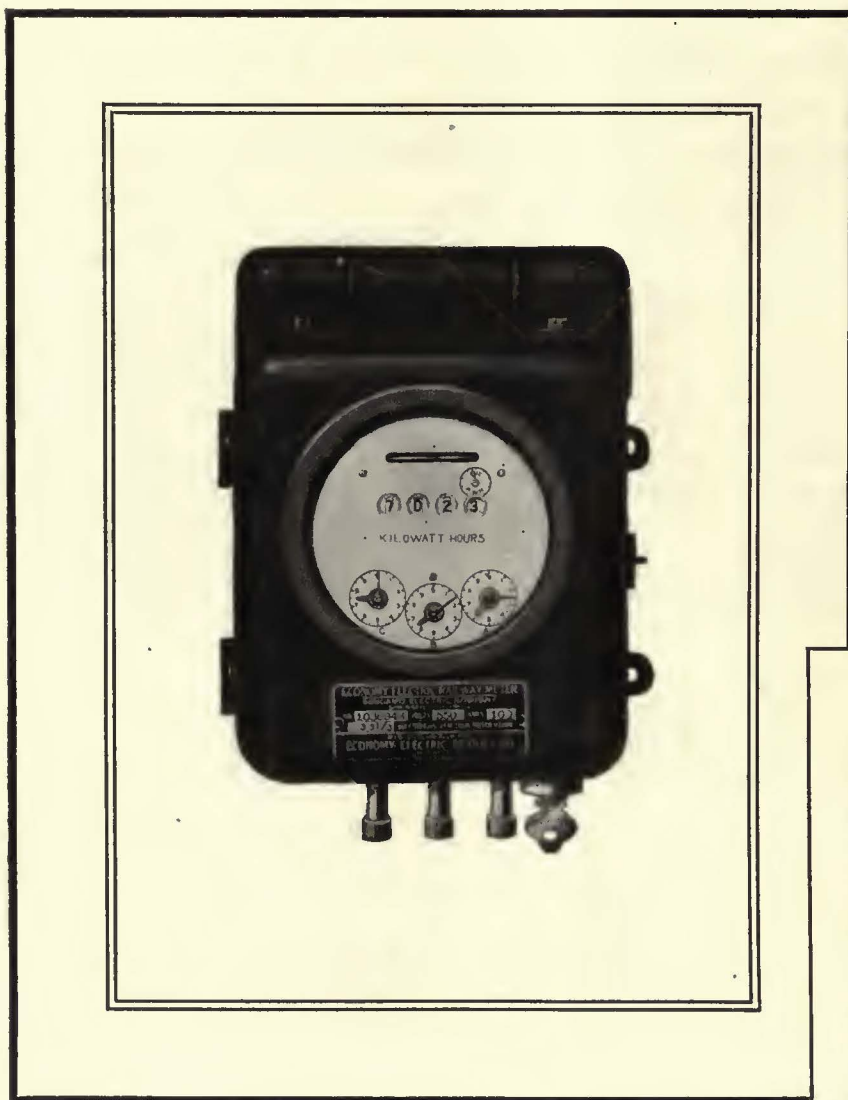
CINCINNATI *New* CARS

A step ahead of the modern trend



PITTSBURGH

ORDERS 1275



To Save Power At The Car
To Save Labor At The Car House

How It Inspects

This is a rugged watt-hour meter. Top dials for motormen's power-saving records. Lower dials for car inspection use.

When the meter-driven hand on dial A reaches the marker set for this car at 6, the barnman knows that the brakes and controllers have done their work and are due for an inspection.

Likewise dial B shows when the car has done sufficient work to require oiling. This supplants the usual time or mileage period for oiling.

Dial C shows when the car has done sufficient work to require general inspection.

After any inspection the meter-driven hand is set back to zero by means of its reset rod at the bottom of the case.

A lock prevent unauthorized resetting of inspection dials.

The Economy meter with inspection dials is readily adaptable to any electric car or locomotive operating condition.

Metering The Energy—

RAILWAYS

ECONOMY METERS

WITH CAR INSPECTION DIALS

Every passenger motor car operated by the Pittsburgh Railways Company will be equipped with an ECONOMY Meter with power saving and car inspection dials. This notable purchase follows a thorough investigation of power saving in modernized mass transportation.

Energy input is the correct measure of the relative efficiency of different men operating under similar conditions.

The motorman has faith in a meter because with it he can prove that good operation gives him a good record and poor operation a poor record, in actual energy consumption.

This power-saving device actually tells the motorman and the management whether power has been saved or wasted, and how much.

That, in brief, is the underlying reason for the success of the ECONOMY Meter.

The ECONOMY "Power-saving" and Car Inspection Meter provides a method that accurately and automatically shows when car inspection is needed. It also shows at a glance how much more work a car can do before

inspection is needed, or, in case of a road failure, how much work the car has done previous to the failure. All this without any clerical labor.

The ECONOMY Meter is a rugged device which requires remarkably little maintenance. Its principal element is also produced for central station and general metering. For this purpose more than 500,000 have been built. It is a standardized product, easy to maintain on a railroad at a cost averaging less than \$2.00 per year, per meter.

More than two hundred street and interurban railways are equipped. The savings more than wipe off the capital charges plus operating expenses of the meters in the first year.

The records from ECONOMY Meters are of high value for managerial and engineering purposes.

Economy Electric Devices Company

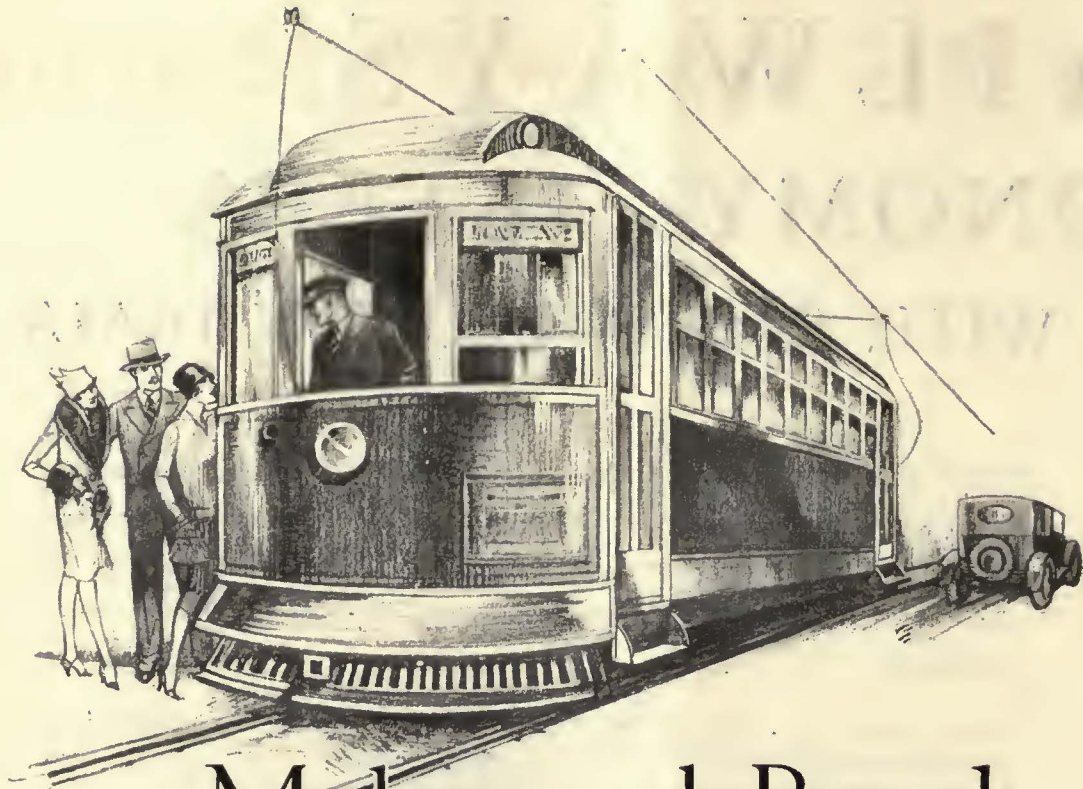
37 W. Van Buren St., Chicago

National Railway Appliance Co., New York
L. A. Nott, San Francisco
Burton R. Stare Co., Seattle

Cable Address: Sangamo, Chicago
Ludwig Hommel & Co., Pittsburgh

Grayson Railway Supply Co., St. Louis
Detroit Railway Supply Co.
Alfred Collyer & Co., Montreal, Quebec

Improves Car Operation



Make and Break

EVERY railway operator knows that friendly relations with the public may be made or broken by seemingly trivial incidents. A helping hand on the car platform—a courteous word—a comfortable seat—these and many other points of contact may make a warm friend.

A noisy gear—a banging door—a flattened wheel, on the other hand, may break friendship and even create hostility.

Progressive railways, therefore, seek to render a well-rounded service. They omit no detail in training employees—overlook no complaint as to zones or schedules—sidetrack no precaution in selecting and maintaining equipment.

The making of more friendships, with few if any breaks, is the surest way to sell more rides and to assure the fairest possible consideration of franchises, paving charges, and adequate fares.

Armature coils not readily available—an incorrectly filled order—a variation in the size or quality of coils—tardy shipments—these and many other details may tie up your rolling stock and break a friendship.

In the General Electric Company's factories and district warehouses, is maintained the most varied stock of repair material that it has ever carried. Every essential part is ready when needed—all obtainable at the same time and from the same source. All parts are of original equipment quality, assuring perfect interchangeability.

Shipments are complete and orders promptly filled. General Electric tries in every way to keep the friends made by its Renewal Parts Service.



GENERAL ELECTRIC

Electric Railway Journal

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Prejudice Must Necessarily Recede Before Analysis

MUCH has been written in the last five years about the place of the bus in the field of transportation, but few men have been more specific about their ideas than was R. N. Graham, manager of railways of the Pennsylvania-Ohio Electric Company, in his paper before the Metropolitan Section of the Society of Automotive Engineers. The experience of Mr. Graham's company has extended to the fields of both urban and interurban service. He has viewed the bus with a sympathetic eye, but he has not allowed himself to become enamored of that vehicle to the extent that his admiration of it has been allowed to warp his judgment. To him there is very little that is tangible in the so-called rubber urge. This is not a theory with him. He has studied the matter at close range. Any choice between the two vehicles on the part of the passenger is simply one of greater convenience. His reflection about the rubber urge is worth pondering, namely, that inferences have been hastily drawn ascribing to this intangible element an influence which it never really wielded. Mind you, this is not derogatory of the bus! Neither was he derogatory of the bus when he said substantially that single-deck buses cannot be operated at a profit even under the most favorable conditions of traffic at the average city rate of fare for a distance greater than 3 miles.

No statement that Mr. Graham made shows better the impartiality with which the matter has been considered than the one to the effect that his company did not intend to operate a street car where a bus could be used more effectively; nor did it intend to operate a bus where the use of a street car produces a more satisfactory result in the service to the public and in financial results to his company. That certainly is specific. It is playing no favorites. The problem is an economic one, and Mr. Graham intends to keep it one so far as his ability goes to interpret events in terms of the best interests of his own company and the greatest convenience of his patrons.

So much was said by him that is significant that in writing about the matter the tendency of the reviewer becomes almost irresistible to repeat the axioms with which Mr. Graham's paper is replete. That, of course, would defeat the ends sought by comment such as this. To everybody everywhere interested in this matter the statement made by the author is significant that there is hardly a city in the United States of 150,000 population that could not well support a supplementary bus service at a 25-cent fare and that the demand for vehicles for this service would furnish a more stable market to the bus manufacturing companies than the attempt to force into mass transportation at standard rates of fare vehicles wholly impracticable to operate from a standpoint of profit.

As for electric railway men, what could be more significant to them than that the company at Youngstown is now operating nearly as many buses as street cars and as a result the railway situation has been improved and bus operation made self-sustaining! Was ever stronger vindication offered of the policy of co-ordination and not of substitution? In that they were very specific Mr. Graham's remarks should tend to preserve a sense of proportion as regards the places of the two vehicles. His statements about the street car and the bus were not iconoclastic of either of these vehicles. The answer to the question of the use of these vehicles is to be found more in analysis and less in prejudice. The farther the first of these practices is carried the more will the other be compelled to recede.

Where Angels Fear to Tread

UNFORTUNATELY, in most large cities, the individual is not permitted to select his transportation service to fit his particular desires and pocketbook. Transportation companies have been forced to develop within narrow limits as to character of service and price. They have not been permitted to provide a different grade of service for the man who is willing to pay more for additional comfort and luxury.

This is not directly attributable to any deficiency on the part of transportation companies. The responsibility lies primarily on the shoulders of those who have exercised regulatory authority over them. And because low-priced transportation service has proved an effective issue on which to ride into office, politicians have too often forced a low-priced, low-grade service (in terms of comfort) whether or not we were willing to pay for more.

The only other choice in local transportation is the private automobile or the taxicab, but the cost for such individual service jumps to five or ten times that of the common carrier. Although the bus afforded an excellent new agency with which to build a new character of service at an entirely different level of rates, and was unrestricted by precedents, its proponents have not always risen to their opportunity. Most of those interested in the development of buses are busy making them into street cars on rubber tires at street car rates, so that the man who is willing to pay more for greater comfort in his daily transportation still has little choice outside the taxicab or private vehicle.

As Mr. Graham has indicated full advantage has not been taken of the opportunity to develop a distinct character of common-carrier service at a level of rates ample to permit a substantially higher grade of transportation service to be rendered. Already in New York, where the scramble for bus franchises pitted a large number of eager bidders against each other, the 5-cent piece has

been permitted to become in the popular mind the unit for measuring bus fares. Despite the fact that this bit of political bait which has sufficed to distract the attention of the long-suffering riding public over many years has so starved the existing transportation companies as to make their so-called valuable perpetual franchises mere obligations to render service at a loss, there are apparently many bus optimists who are anxious to rush into an obligation to run buses at street car rates on the bland assumption that a franchise to conduct a service at a loss is worth a lot of money. Of course, there can be no particular quarrel with those who are willing to put up their money under such conditions, but in the fact that these promoters are dragging the bus down to the level of the sadly starved New York street car they are establishing precedents for the bus that will be difficult to overcome in the future.

Marking the Price on the Package Does Not Guarantee Its Worth

CRITICISM of the present popular practice of issuing no-par-value stock is one of a number of interesting points emphasized by Prof. William Z. Ripley in his recent writings on various phases of corporate financing. Like most generalizations, his comment fails to fit in many instances. So far as electric railways are concerned, his criticism seems to have little application, and the arguments in favor of no-par-value stock appear to be at least as strong as those against it.

Briefly stated, Professor Ripley's objection is that the issue of stock without par value makes it difficult to determine how much money actually has been invested in the property and hence to some extent shrouds in obscurity the financial status of the company. In the case of a utility under the jurisdiction of a regulatory commission, there are two groups which have a legitimate interest in its financial affairs—its security holders and its customers. It is difficult to see how either group would benefit greatly by the establishment of a par value for every share of stock.

No fixed relation exists between the actual value and the par value of any stock. The actual value is determined by the equity behind the stock and by its potential earning power. Frequently, earnings are plowed back into the property, thereby increasing the value of the stock far above what it was originally. Many electric railways at times when it was deemed inexpedient to issue securities have financed improvements out of earnings. To those not in a position to know all the details of the company's affairs, the establishment of a definite par value for its stock may easily be more misleading than informative. Records are always available, however, to show the capital expenditures that go into a property. In these records lies the stockholders' best protection.

The customer's interest in the financial affairs of a utility concerns only their effect upon rates. At present, rate determination depends almost universally upon a valuation which is entirely independent of the face value of outstanding securities. A reasonable return is allowed on the so-called "actual value" of the property. Par, therefore, means nothing to the customer. His interest is protected by a regulatory commission. Under these circumstances the value of the stock may well be left for determination to the law of supply and demand.

South Shore Line a Trail Blazer

IN ITS revolutionary step of placing in service all-steel, six-truck, parlor-observation and dining cars, the Chicago, South Shore & South Bend Railroad has delivered a smashing blow to competition as well as to a case-hardened precedent of the industry—the practice of false economy.

In the latter case, such service aligns the South Shore with those trail blazers in the field who long have realized that men and fashions change, that today comforts are not considered luxuries as they were ten years ago. To prove this assertion, one has only to walk through any of the steam railroad express trains. Gone are the lunch boxes and crowded day coaches. From every walk of life can be counted those who are availing themselves of the creature comforts afforded by de luxe service. With the economic upheaval incident to the World War has come a demand for a better class of traveling facilities. What was good enough for father is not good enough for son. The people are willing to pay for better service, and if the electric railways will not supply it, then they will seek that form of travel commensurate with a new social status.

While not all public utilities can afford the refinements of the South Shore, they can, nevertheless, follow its example in proportion to their means. Clean cars, paint, courteous service, a few little appeals to the new tastes of passengers, and informative publicity will, in proportion, place the little fellows of the industry in the front rank of trail blazers.

Progress today is a huge juggernaut that pursues us relentlessly. If we hold to the old fanatical precedent, then sooner or later, like the Indian ascetic, we will be mashed flat. Such adherence to hidebound precedent is a beautiful gesture with a meaningless purpose. It is creating a lot of industrial morons.

Temper Your Tools Before You Cut

SINCE public relations, as the name implies, covers all phases of a company's dealings with its public, no possible element of contact should be slighted. Least of all should those in charge of a railway's destinies discount the important rôle which the platform men may play in stimulating that somewhat intangible, but none the less essential, asset of good will.

Should a surgeon exercise the greatest diligence in preparing his instruments for use in an operation, sterilizing them with minute attention, and then fail to give equal attention to the hands which will guide those instruments, he would fall far short of his duty. And the conductors and motormen are the very hands of the railway. It is they who come daily in personal contact with the passengers. The public relations department may talk till it is literally blue in the face; it can publish house organs and lay out advertising campaigns which will indicate beyond peradventure that the company's first and primary consideration is the welfare of its passengers. But the yardstick by which Mr. Average Man measures the railway and its service is simply the attitude of the rank and file employees toward him. This is of course assuming that the company is playing fairly with its patrons and is endeavoring to give frequent and comfortable service.

Complaints of discourtesy, of personal shortcomings of individual employees, are most difficult of all to handle satisfactorily. With a complaint of inadequate service in a certain section of a community it is possible to determine specifically whether the requested improvements are feasible. Service complaints may be reduced to more or less simple considerations of profit and loss. But not so with the personal factor. It is difficult to obtain fair and incontrovertible proof of an employee's culpability. The unsubstantiated word of the complaining passenger cannot always be accepted. Possibly the patron deliberately set out to stir the animus of the employee and is endeavoring to wreak his vengeance upon the individual for real or fancied grievances against the company.

But it may safely be asserted that where the total of personnel complaints on a given property is exceptionally high there is some fire to justify all of the smoke. The direct dealings of an established public relations department with the public are essential and worthy of careful attention. But the best way of reaching the passengers is not through the newspaper columns or over the radio. It is simply through the smile on the face of Conductor Brown or Motorman Jones. There is no use in theorizing with the men. Show them specific instances in which they can establish themselves in the eyes of their passengers as transportation salesmen. They are not blind to the importance of their own jobs, but they need thorough enlightenment on the important subject of public relations. They must be shown the how and the wherefore of adopting merchandising principles in the collection of fares and the operation of street cars. Let the individual once feel his personal responsibility for the success of the public relations campaign that his company is making and half the battle is won.

New Money for a Regulated Utility Is in Competition with Industry

DISTINGUISHED from a manufacturing establishment, the utility is supposedly non-competitive. This condition is only partly true, but because of it the utility is hedged in with many laws and regulations intended to limit its earnings and to control its financing. This control is either by public service commissions which establish the status of utilities from time to time as operating or economic conditions dictate, or by service-at-cost franchise in which the rates and the rate bases is determined once for all in advance.

Frequently it is overlooked that two streams of money must be continually flowing into a utility property serving a growing community. One stream, in the form of revenues derived from the sale of service, must pay all of the operating costs, the maintenance of the physical equipment, interest on borrowed capital and a profit to the owners. The second stream is the new capital that is necessary to keep the property abreast of the times, to build extensions and make possible service to new customers. The utility, therefore, must for this reason frequently go into the open market to borrow money. To be successful it must pay the market price and must meet the market conditions of the moment. If not free to do so new money will be diverted to other channels and the company cannot properly grow to serve its public.

While many complex financial situations may arise in the operation of utilities, at the base of them all is this situation that the utility, no matter how it is regulated, is in competition with all industry in the search for new funds. It is one thing for a regulatory body to limit earnings on money already obtained, but it is quite another to hold them so low that investors cannot be induced to supply the capital necessary for expansion. A commission may control the fare charged and the rate of net earnings that may be allowed. It cannot, however, force the investor to put his money in an enterprise where there is little hope of profit and no guarantee of ultimate safety of principal. For this reason, the condition of the money market must be an ever-present factor in the regulation of earnings.

Twin Cities Confident of the Results of Co-ordination

NOT the least important of the statements contained in the annual report of the Twin City Rapid Transit Company is the expression of confidence on the part of the management that the services of the company can be successfully co-ordinated. This is particularly significant because co-ordination there contemplates the welding together of electric railway, bus and taxicab services on a scale of no mean proportions in its contemplation of the use of the bus and the taxi. The net earnings of the buses for the year 1926 were small, but the explanation given is that complete control of the bus lines was not acquired until the early part of 1926. Time is the element needed to consolidate operations on an efficient basis. With the start well made on that program, the management is satisfied that the bus properties will earn a much larger return during 1927. As for the acquisition of the taxicabs, their ownership has been a matter of only a few weeks duration. About them, too, the management is optimistic. It feels that the unification of the competitive cab companies will materially improve public transportation by reducing congestion. Certainly that end would not be achieved under competition.

These things are in the future. As for the past, the company closed 1926 with a net income of \$1,436,805 transferred to profit and loss compared with \$1,037,427 for the previous year. In addition to the dividends on the preferred stock it paid four quarterly dividends of 1½ per cent on the common stock, or 1 per cent more than was paid during 1925. Gross revenue was up about \$1,500,000 and the recession in passengers carried was inconsequential compared with the grand total carried the year before. Some kinks still remain to be ironed out under the settlement plan which governs the terms under which the company is now operating in St. Paul and Minneapolis, but the progress made indicates that the cities and the company face a future auspicious for both of them. This statement is perhaps subject to the reservation that nothing comes of the so-called Brooks-Coleman legislation, now pending in Minnesota. The case against that legislation is very strong. Repeal of the state regulatory act, contemplated by this measure, would, to say the least, destroy much of the effect of the recent harmonious moves in the Twin Cities. That is not a prospect which the people of these cities can contemplate with equanimity.

\$3,500,000 for Expansion of Transportation Facilities in San Francisco

Because of the steep grade in the adjacent street, this car line was diverted through the edge of the park where a cut was possible. It is proposed to extend this route 2.73 miles, partly on private right-of-way, similar to that shown here, and partly through paved streets.



By M. M. O'Shaughnessy

City Engineer San Francisco, Cal.

Municipal Railway Will Open New Ocean View Line This Summer—Track Extensions Totaling 11.6 Route-Miles Are Planned—47 Additional Cars and 26 Buses Will Be Bought

RECENT improvements made by the Municipal Railway of San Francisco and new projects planned for the near future involve extensive changes in the local transportation system of that city and surrounding territory. A new car line to serve the Ocean View district will be opened this summer. The Duboce tunnel, an undertaking similar to the famous Twin Peaks tunnel, will be completed in the latter part of this year or early in 1928. A four-track addition is being made to the Mariposa Street carhouse. New shops and garage facilities are planned. Track extensions of considerable length are contemplated and much additional rolling stock will be bought. These improvements are to be financed by a bond issue of \$3,500,000.

At present the railway operates 188 double-truck and 21 single-truck passenger cars on about 70 miles of track. It is planned to add 47 double-truck cars. The majority of the present cars are of the California type, 47 ft. 1 in. long and 9 ft. 2 in. wide with seating capacity for 54 passengers. The average weight is 50,000 lb. They are of semi-steel construction and on account of the severe grades are equipped with four 60-hp. or 65-hp. motors per car. In the near future 26 new buses will be added to the thirteen now in operation. Thus the next year will see a substantial expansion in the transportation system which originated fourteen years ago through the taking over of the Geary Street cable line from the Park & Ocean Railway, whose franchise had expired.

At that time the cable construction was torn up and the old road was converted into an electric line, with

extensions reaching west to the ocean and east to the ferries. The first section of this line was placed in service in December, 1912, and in June, 1913, the balance of the Geary Street line was placed in commission with 15.08 miles of single track, together with 1.10 miles of sidings and turnouts.

To handle the traffic to the Panama-Pacific International Exposition, held in 1915, a bond issue of \$3,500,000 was voted in 1913. The line of the Presidio & Ferries Railroad, whose franchise had expired, was acquired in December of that year, and in less than twelve

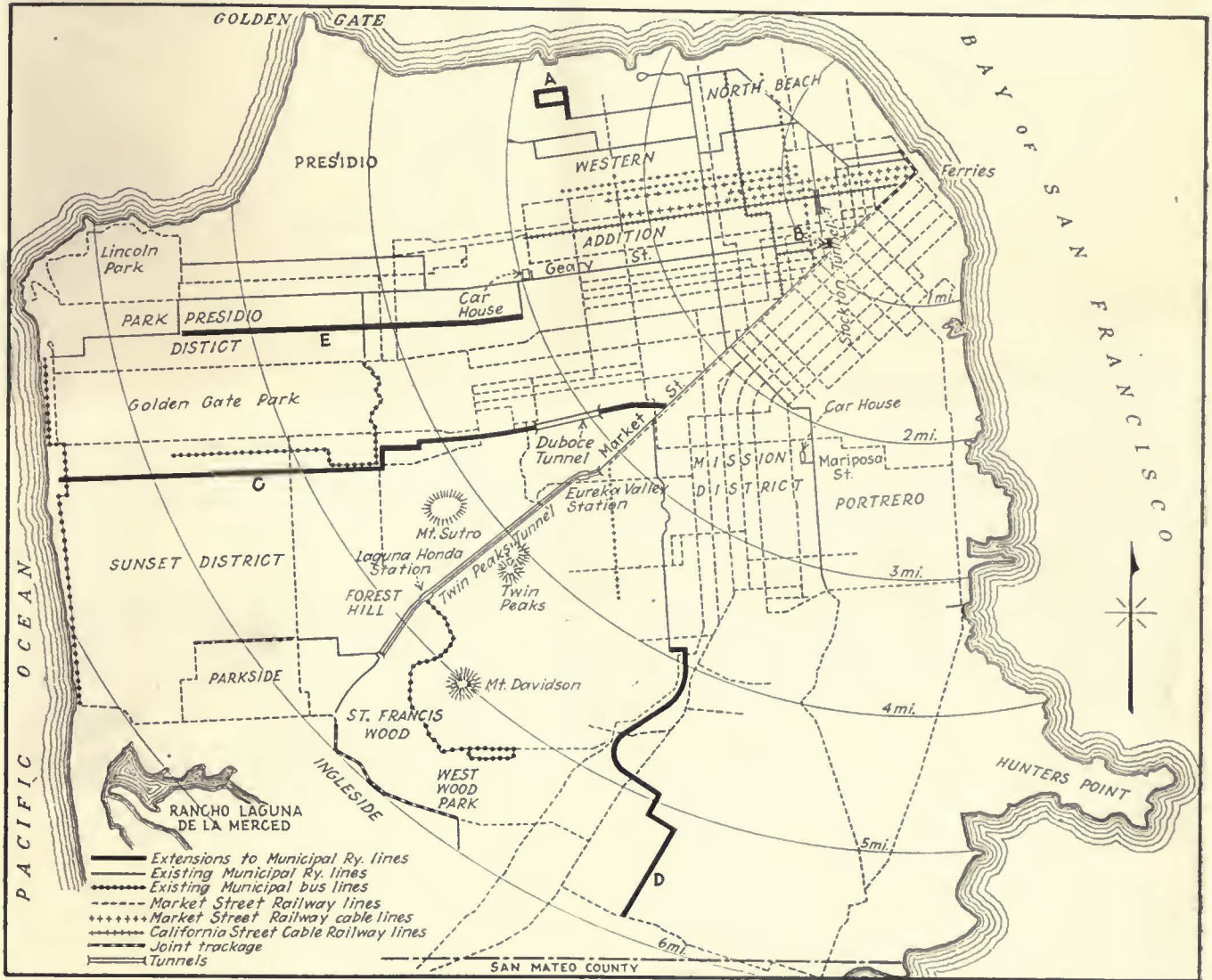


Type of Station Used at Intermediate Points of Tunnel. Elevators Lower the Passengers to the Train Level

months from the time of voting the bond issue new lines, constructed from these funds, were placed in commission.

In general, the policy of planning new lines has been to supplement the privately owned system of the Market Street Railway by building only where the new routes would serve territory not otherwise taken care of. Only such competitive lines have been built as were considered necessary to make the municipal system an operating entity. Thought has been given to the trackage

property lying on the remote side of the hills from the main business district it has been necessary to drive two tunnels through intervening ridges and the construction of a third is now in progress. The shortest of these is the Stockton Street tunnel, approximately 900 ft. long, which leads from the main business section to the North Beach district. This was completed and used in connection with the 1915 exposition. In 1918 the Twin Peaks tunnel was opened. This is exclusively rapid transit, 12,000 ft. long, 25 ft. wide and 18 ft. high, pro-



Track Extensions Totalling 11.6 Miles of Route Will Substantially Augment Transportation Facilities in San Francisco. (A) Marina Track Extension, (B) Downtown Loop Connection, (C) Duboce-Sunset Extension, (D) Excelsior District Extension, (E) Balboa Street Extension

necessary for a unified system, combining both privately owned and municipally owned lines. This is the ultimate end in view as it is believed that only through the unification of transportation facilities can maximum service be secured.

San Francisco is a city of hills and these have had a marked influence on the layout of the street car lines. The cable railway was first developed here and to this day a considerable number of routes must be operated by cable in order to negotiate the grades. These lines are slow and inflexible as to routing. It is impossible to replace them by trolley lines without making detours or resorting to expensive private rights-of-way, neither of which will give direct service as do the cable lines.

To provide access to some of the desirable residential

viding a high-class residential territory with transportation many minutes faster than it had previously.

The Duboce tunnel, now being built, has the same cross-section as the Twin Peaks tunnel. Through it a new line to the Sunset District will be operated. This tunnel has a length of 4,200 ft. and will be placed in commission late in 1927 or early in 1928. All of these tunnel projects have been paid for by assessments levied on the property directly benefited.

Grading for the extension of the railway into the Ocean View district, running from St. Francis Circle through the Merced Rancho lands, was completed about a year ago. It was necessary to make two large earthfills across gulches which, on account of the dryness of the season, were expected to settle. This made it in-

advisable to lay track at once. Experience during the past wet season showed the wisdom of this delay. Trolley poles, wires and feeder cables have already been erected and contracts recently were awarded for the track laying. This will be completed during the coming summer.

Several track extension projects are planned for the near future. The area once occupied by the Panama-Pacific exposition has been subdivided, streets have been paved, sewers built and 200 houses are now being constructed. The whole district is being settled very rapidly, but is without adequate transportation, although the Municipal Railway is adjacent to it on two sides. It is proposed to construct 0.69 mile of new route to serve this area. By the construction of 1.9 miles of new track a downtown loop can be built to relieve congestion at the ferries and provide an emergency route in case of a blockade on Market Street. Completion of the Duboce tunnel already referred to will necessitate the construction of 4.54 miles of new double track from

traffic necessitates the construction of 2.79 miles of double track on Balboa Street, roughly bisecting the unserved area. In all, these projects total 10.94 route-miles and would cost \$1,395,000 for track construction. A summary of the mileage and cost is given in an accompanying table. Their locations in relation to the transportation system as a whole are shown on a map



Carhouse Facilities of the Municipal Railway of San Francisco

At top—New inspection and storage tracks recently constructed on the upper level of the Mariposa Street carhouse.

Center View—Carhouses of the Municipal Railway of San Francisco are designed to permit entrance at different levels from two streets. This shows the front entrance of the Geary Street carhouse.

At left—Recent improvements at the Mariposa Street carhouse include a recreation room for employees.

Market Street to the beach. At present a large territory known as the Excelsior district is without any transportation. It is proposed to extend the Church Street line via private right-of-way and existing streets to a point near Geneva Avenue, a total distance of 2.73 miles. Between Fulton and Geary Streets is an area approximately 2,640 ft. wide without transportation facilities. The growth of this district during the past few years has been phenomenal. Proper handling of the

on another page. Other short additions bring the total of proposed new routes to approximately 11.6 miles.

Proposed extensions of bus operations involve five new routes and 7.67 route-miles. Details concerning the bus operation of the Municipal Railway will be given in an article to appear in a future issue of ELECTRIC RAILWAY JOURNAL.

At present two steel and concrete carhouses are in use in different sections of the city. The sites were selected with a view to double-decking, cars going into the lower level from one street and onto the upper level

SUMMARY OF RAILWAY PROJECTS

	Route-Miles	Cost of Track
A Marina tract	0.69	\$60,000
B Downtown loop	0.19	70,000
C Duboce-Sunset	4.54	567,000
D Excelsior district	2.73	343,000
E Balboa Street	2.79	355,000
Total	10.94	\$1,395,000



Entrance to Starkton Street Tunnel. The Duboce Tunnel, which it is hoped to complete by the end of the present year, is similar in purpose although considerably longer

from another street at a higher elevation. The Geary Street carhouse will accommodate 120 cars and that at 17th and Mariposa Streets 140 cars. During the past year a second story was added to the carhouse at the latter location. This does not cover the entire area of the lower story, but provides four extra storage tracks with inspection pits, giving an added capacity of 32 cars. Offices for the assistant superintendent, dispatcher, inspectors and cashier, as well as a waiting room, recreation room and reading room, have been provided.

Provisions were made in the original Geary Street carhouse for a small repair shop to take care of the 43 cars then owned. The Municipal Railway now has 213 cars, thirteen buses and other equipment which must be maintained. No addition has been made to the original shop space and it has now become impossible to keep up with the work to be done. An appropriation of \$250,000 is desired for the construction of a modern car maintenance and repair plant.

Subway Building Filmed

CONSTRUCTION work on the Eighth Avenue subway system in New York City is shown in motion picture film recently released by E. I. du Pont de Nemours & Company of Wilmington, Del. This film, which is entitled "Building New York's Newest Subway," is printed on safety stock, is one reel in length and requires fifteen minutes for showing.

The film is a veritable trip along the line of activities, as it shows not only scenes underground where great ledges of rock are being blasted away in the tunnels but also work in the open trenches and cuts. How windows are safeguarded from vibration caused by blasting, how monuments are propped up and how telephone and electric cables are kept in operation are pictured in the reel, as are the great tools used in the work, such as telfers, caterpillar shovels, powerful trucks and steam hoists. Scenes showing how explo-

sives are used and stored on the job are interesting features. Other views show partially finished sections where the steel framework is in place.

This film may be obtained upon application to the publicity bureau of E. I. du Pont de Nemours & Company of Wilmington, Del.

Vienna Slowly Recuperating

Statistics of Traffic During Last 21 Years Show Many Fluctuations and Recent Large Increase in Passengers—Flat Fare Now Used

LOCAL transit conditions in Vienna during the past 21 years are treated in an interesting review in a recent issue of *Verkehrstechnik* by Dr. A. Winter of the Vienna Municipal Railway System. The period covers nine years prior to the outbreak of the war, five war years and seven post-war years. The means of communication in Vienna are an extended surface railway system, an elevated and subway rapid transit system and buses. All of these are now owned and operated by the city.

With a population of 1,800,000, Vienna has today about as many inhabitants as it had in 1905. The steady growth of population in pre-war years reached a maximum of 2,200,000 at about the beginning of the war at the end of 1914. During the war the figure fluctuated, but by its close a heavy decline had set in. Since 1920 the city has recuperated slowly in population. Fully dependable statistical investigations carried on for many years past disclose the notable fact that within recent years the total number of rides on public vehicles has been constantly growing. In spite of the greatly decreased number of inhabitants, the average number of daily rides on trolleys and rapid transit systems is today about the same as it would have been had the old ratio been maintained and the city grown steadily at the rate of pre-war years.

Various factors are responsible for this rather paradoxical development. The chief reason is the gradual shifting of the center of population away from the business center, so that people have longer distances to cover to get to and from their work.

Up to 1916 Vienna used the zone fare system with three graded fares. In that year, owing to the rapid increase in the number of maximum fares, as compared with the two lower rates, the lowest fare was dropped. This left only two rates, and in 1921 one unit fare was adopted for all rides.

The average distance traveled per passenger per ride grew gradually but constantly from slightly over 4 km. (2½ miles) in 1908 to 5.6 km. (3½ miles) in 1926. Like most metropolitan cities, Vienna has shown during the last twenty years a decided "city formation"; that is to say, the center of the population is moving more and more away from the inner part of the city, which is the business district.

During the war years a very large increase in business was done by the surface lines, the peak being reached in 1918. The reasons were the enormous devaluation of money, the greatly increased number of male and female workers in war industries and the large number of business people and soldiers called to Vienna, as the war center of Austria. During the following year, 1918 to 1919, a decline set in, more violent than the previous rise, caused by restrictions of operation due to scarcity of coal and cars, and the general poverty of the people. During 1920 and 1921 a distinct improvement in traffic was again recorded. This was again followed by the deflation panic of 1922, when the lowest point was reached. Money became next to valueless, causing the cost of living, expressed in this money, to soar to unheard of values. Families depending upon a fixed income, like annuities, had great financial difficulties, but wages and salaries were raised as the value of the currency declined. During this period the trolley system carried practically all of the

customary for the workman to move nearer to his new place of employment when he changed his job, he had to stay now where he lived, regardless of how far he had to travel to his new place of work. A large army of workmen is thus being transported daily by the trolleys between their homes and their factories. More than 80,000 persons are at present seeking more con-

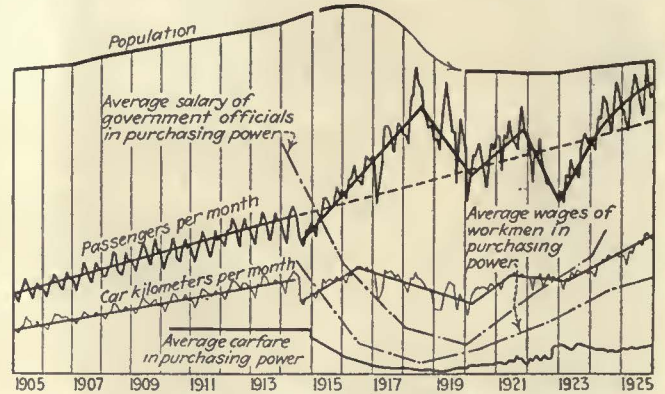


Chart Showing Purchasing Power of Wages and Other Data Affecting Riding in Vienna

venient living quarters. An extensive building program, covering the erection of 25,000 houses for some 100,000 people, is now in progress. The houses are being built in blocks, scattered over the entire area of Vienna.

Another and very important impetus to more frequent riding on public conveyances was given by the electrification of the Stadtbahn (elevated and subway line) in 1925, with the same ticket valid on all rail lines, both trolley and rapid transit. With the greater speed and comfort on the new electric trains the passenger traffic on the Stadtbahn more than doubled. At present 270,000 passengers are carried daily. During morning rush hours (if this expression can be used for Viennese traffic), between 7 and 8 a.m., an average of 22,000 passengers are transported.

On pleasant Sundays and holidays in the summer as many as 60,000 persons have been carried during a four-hour afternoon period. A noticeable addition to the number of public carriers is contributed by motor buses, which operate radially from the center of the city to the outer trolley lines.

A final impetus to travel which should be included is no doubt the very low unit fare, which is only 80 per cent of the pre-war average fare. This percentage corresponds to two-thirds of the purchasing power of the fare in 1914. For this reason a further increase in passenger traffic may be expected.

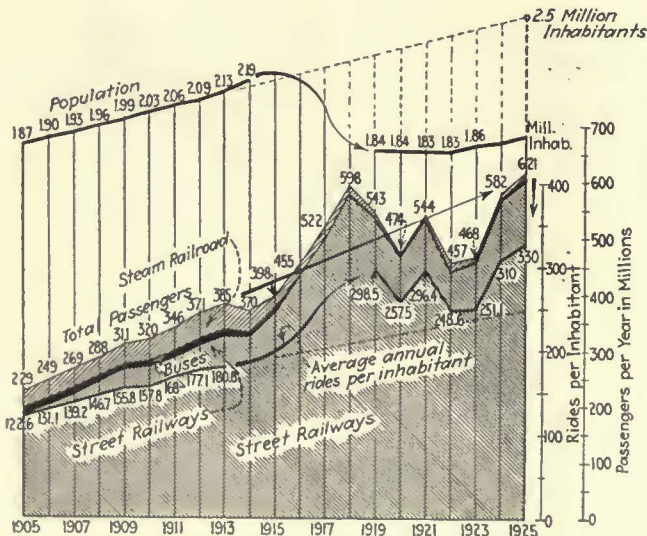


Chart Showing Data of Vienna Local Transit

traffic, as bus lines and entire sections of the rapid transit system had to suspend operation.

Conditions began to improve at the end of 1922, showing immediately a rise in traffic again. Another factor in favor of increased trolley riding was the exceedingly acute scarcity of living quarters. Building had practically stopped since 1915, and while it was previously

Indiana Utilities Important Revenue Producers

SEVENTEEN per cent of the taxes collected in Indiana are paid by public utility companies, Fred A. Sims, formerly chairman of the Indiana tax board, recently told classes in public utilities and public utility law at the School of Commerce at Indiana University. He said that the importance of these properties as revenue producers might be illustrated by the fact that in 1924 they represented 12.88 per cent, while in 1926 they represented more than 17 per cent of the total value of property for taxation in the state.

One of the fare zone limit signs along the route. This view shows the type of concrete highway over which the coaches run and the character of much of the territory.



Interurban Service Offers Broad Field for the Bus

By R. N. Graham

Manager of Railways Pennsylvania-Ohio Electric Company

Electric Railways Have Never Covered the Field that Exists for Transportation Outside the Cities, and Today Buses Are Able to Handle a Great Share of This Business—Operating Refinements Overlooked in Bus Design Should Be Given Attention

IN THE field of suburban and interurban service there is a tremendously great future for the motor bus. Here we are no longer limited by a flat fare. Every ride is a zone ride. The territory where interurban street railways were never built is vastly greater than the unfilled field in city operation. Since the ratio of initial investment to the number of passengers carried is so much less in the case of the bus than the street car, it is possible to operate bus lines where under no conditions was it possible to operate any form of transportation requiring a fixed investment in way structures.

Thus the communities without adequate public transportation connection with other communities which are either natural markets, sources of supplies or in which there are other community interests are rapidly being connected with motor bus lines.

Where interurban railways have already been built the bus can be used by such properties in an intensive development of their territory such as was never possible without the bus. On our own property prior to 1922 we operated approximately 60 route-miles of interurban and suburban railway. We are now operating nearly 400 route-miles of coaches. The comparison of our present

interurban operation with coaches and street cars is as shown in the accompanying table.

The number of coaches and street cars shown in this table is the number required for regular runs. We own 29 modern interurban cars and 43 interurban coaches. Parallel to our interurban lines the coach service is a high-class express service operated at a higher rate than the electric cars, which carry heavy industrial loads that could not easily be handled by the smaller capacity coaches. The connections of Youngstown with Cleveland, with Akron and with Meadville are natural transportation routes which it would not have been possible to establish by building interurban railways in recent years.

It is thus apparent that the use of the motor bus has enabled us to give not only a more comprehensive service to points where our rail lines already operated, but has enabled us considerably to extend our service to the public.

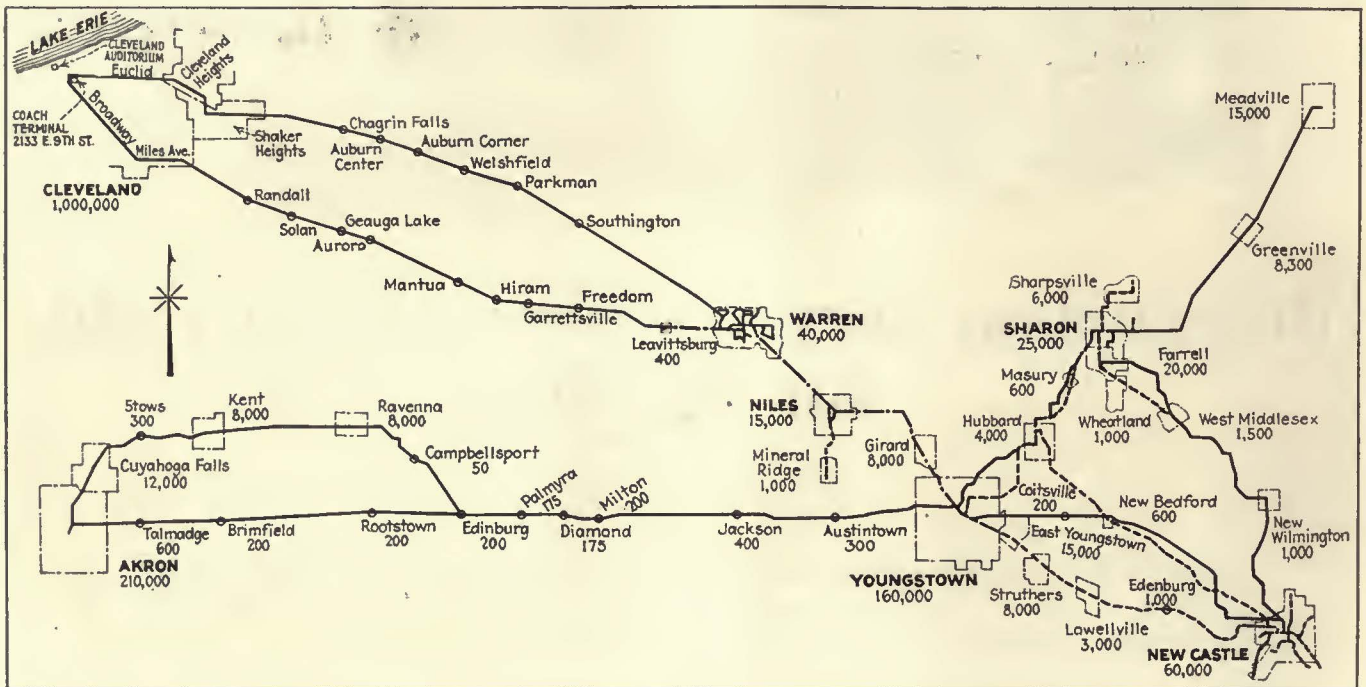
On our main interurban coach lines we maintain complete and adequate terminal facilities in the larger cities. In cities such as Cleveland, Youngstown and Akron to maintain a modern waiting room in the heart of the city represents a great expense, but we feel that we cannot offer our fa-

THIS is the second article based on an address before the Metropolitan Section, Society of Automotive Engineers, by Mr. Graham in New York on Feb. 17. The first article, which covered the place of the motor bus in urban transportation, was published in last week's issue of *ELECTRIC RAILWAY JOURNAL*. Mr. Graham has taken up the field for interurban bus operation and also points out to manufacturers some of the features of bus design which cause difficulty in operation.

cilities to the public as a real service without extending all necessary conveniences to it in its use of our service. In all the towns through which we go we also maintain depot arrangements. Our routes are marked with zone markers, and stations, both in the great cities and small towns, are equipped with electric signs. On our line from Youngstown to Cleveland we maintain garages in Youngstown, Warren and Cleveland, with relief coaches for use that the service may be certain. On our line between Youngstown and Akron we maintain garages at Youngstown, Edenburg and Akron for the same purpose. We have never annulled a trip on account of ice, snow, fog or road conditions. We have operated this interurban service during wintry months when the operating expenses were more than twice the revenue obtained, feeling that

order to maintain the same degree of upkeep. We have seen many reports of bus operation indicating handsome profits which would have a tendency to deceive the promoters since it was a first year's operation, before heavy maintenance was reached.

In order to illustrate this point take the operating expenses of the Youngstown Municipal Railway for its bus operation by years. These were shown in Table IV in the article in last week's JOURNAL, page 376. To get a true picture of what can be produced in this operation and strike a parity between depreciation and upkeep, if buses were to be depreciated on a four-year period I believe the depreciation should be charged off as follows: 40 per cent the first year, 30 per cent the second year, 20 per cent the third year and 10 per cent the



Comparison of the Extent of Interurban Car and Bus Service by Pennsylvania-Ohio System

when we have finally established the fact in the minds of the people that coach transportation is perfectly dependable they will feel as safe in undertaking a trip in zero weather as in balmy midsummer.

BOTH EARNINGS AND EXPENSES HIGH

That our hope in this line is justified is indicated by the fact that our Youngstown-Cleveland line produces a gross operating revenue of 44 cents per coach-mile, which is the highest revenue per mile of either car or coach in our entire operations. However, our expense on these interurban lines, due to cost of terminal facilities, the elaborate arrangements made for maintaining our schedule and the high class of maintenance upon which we insist, is far beyond any figure that I have heard or seen quoted by proponents of bus operation.

For the first three years of our operation we charged off depreciation on our coach equipment at the rate of 25 per cent per year based on four years life of the operating units. In January, 1926, the condition of our original coaches and buses was such as to indicate that the four-year life predicted was too short and we changed our basis of depreciation to five years.

It has been our experience that maintenance expenses increase steadily over the life of the coach or bus in

fourth year. Including depreciation as a part of the operating expenses, the operating expenses would be practically uniform over a four-year period.

As a result of our experience, I have a few thoughts that I would like to submit to the motor bus manufacturers. The engineers seem vastly concerned about improving the design of the power plant, the shape of the combustion chamber, the contour of the heads and other refinements of this character. In our operation the maintenance of the engines themselves has never been a major problem. One of our principal worries is the matter of brakes; the largest number of interruptions to our schedule results from brakes and the largest amount of time spent in maintenance of any one item is on brakes. We have no unit in which we believe that the brake proposition has been solved. The brakes require adjustment too often, too much time is spent in relining and the job of relining is too much of a job. The use of air brakes has introduced another serious proposition and that is extraordinary wear on tires.

OPERATING FEATURES OVERLOOKED IN DESIGN

The chassis builder does not seem to be concerned about time lost in filling buses with fuel. A large proportion of our buses require ten to fifteen minutes to

fill the tanks on account of flat filling pipes. Our state laws require the use of accurate speedometers. We have never had favorable results from speedometers themselves, or adapters or speedometer drives. I am the chairman of the committee on bus operation of the American Electric Railway Transportation and Traffic Association and I find that this complaint is universal throughout the industry, and have been asked to take it up with the motor equipment manufacturers in order to obtain some dependable and satisfactory means of ascertaining the speed of our units.

There have been great developments in the strength of such parts as frames, driving spindles, propeller shafts and other parts that take the strain of these heavy moving vehicles, but in our experience there is no excess strength in any unit that we operate. We do not believe that aluminum castings should be used in any chassis part

had several drivers arrested for operating with open cut-outs when we have no cut-outs on our coaches. We have been compelled to detour operations around hospitals and schools on account of noise complaints. One of the chief complaints against street railway service has been noise produced by cars. With the use of the automobile there is a chance to get away from this unpleasant factor, and yet after years of engineering on motor coaches and buses it seems impossible to have the engineering end of the manufacturing industry even



Some of the Stations on the Cleveland - Warren-Youngstown Interurban Line of the Pennsylvania - Ohio Coach Company

- 1. Welshfield
- 2. Auburn Center
- 3. Chagrin Falls
- 4. Warren Terminal



where strain is to be undergone. We have had several cases of serious near-accidents due to breaking of the aluminum spiders on steering wheels.

MUFFLERS INADEQUATE

It is necessary for a company operating buses and coaches to preserve pleasant public relations. More friction is developed between our company and the public with which we must live through inadequate mufflers than from any other source. In only one make of vehicle that we have used is there freedom from complaint on this source. Within the past months we have

give serious attention to this important matter.

Too little attention is given in coach design to safety considerations. There have recently been brought out designs in which it is impossible for the driver to see his right front fender or right curb except at some distance ahead of the vehicle. In our operation every other consideration is secondary to safety and we would never feel we were discharging our duty to the public and to our stockholders by operating a vehicle hopelessly handicapped from a safety standpoint.

Too little consideration has been given to the matter of providing for the use of chains in icy weather. I have heard it contended that certain vehicles do not need chains. We operate a great many different standard types of vehicles, and on the heavy grades on our interurban lines under the icy conditions that have prevailed this winter there have been a number of days when it was impossible to complete a trip without installing chains.

These matters are not of fundamental importance and of course will eventually be taken care of. The modern motor bus is a substantial, sturdy and useful vehicle.



From Any Seat in the Coach a Clear View of the Country is Obtainable at All Times

On our property altogether we have 125 of them, representing an investment of nearly \$1,000,000. The garages which are used by us represented an investment of \$200,000 and parts and auxiliary property \$150,000 additional.

Prior to our use of the bus in Youngstown there was not a single first class bus operated in the city. On our interurban operation we have purchased from time to time approximately eight operations. Only two of these owned any rolling stock that we would be willing to place in the service of the public. In the case of the two operations that did have rolling stock we could use, we paid a large part of the original purchase price to the manufacturer after we had purchased the property, notwithstanding the fact that the vehicles themselves were practically worn out.

We have increased the service substantially on every line that we have bought. We have co-operated with every independent bus operation in our territory. In

Youngstown, Warren and Sharon we furnish the terminal facilities for all interurban bus lines and for a large part of the lines out of Cleveland. In co-operation with the leading independent bus lines in our territory we sell an interchangeable mileage book which enables the traveling public to ride easily and freely over north-eastern Ohio. We sell through tickets from Cleveland

COMPARISON OF INTERURBAN COACH SERVICE AND INTERURBAN CAR SERVICE PENNSYLVANIA-OHIO SYSTEM—YEAR 1926

	Coaches	Cars
Number operated	29	27
Revenue	\$584,116.54	\$661,943.73
Mileage	1,910,940.58	1,743,553.10
Revenue per mile	0.305	0.382

to a great many different points in which a part of the ride is on our own line and a part of the route over independent bus lines. We have joint ticket arrangements with at least half a dozen independent bus lines that have no connection whatever with electric railway properties. We advertise their service in our schedules and in many cases extend the assistance of our schedule and traffic departments to those independent lines to help them to form their schedules and tariffs intelligently and to comply with the rather technical requirements of our public utilities commission.

If our history and attitude is in any manner typical of that of the electric railway industry, there certainly is every reason for co-operation between the electric railway industry and the great manufacturing industry furnishing bus equipment.

McClintock Recommends Laws Against Slow Driving

ESTABLISHMENT of minimum as well as maximum speed limits is recommended by Dr. Miller McClintock, director of the Albert Russel Erskine Bureau of Street Traffic Control, to help relieve the growing traffic congestion in American cities. While excessive speeds are condemned as causes of delay and oftentimes accidents, Dr. McClintock suggests that minimum speed regulations be made of about 50 per cent the maximum on busy arteries. In discussing this problem Dr. McClintock said:

"Drivers who insist on holding up traffic to a snail-like pace of 5 or 10 m.p.h. on important streets should be subject to a certain amount of legal prodding. When streets are filled with vehicles the slow driver regulates the speed of all following traffic and by his selfishness or carelessness often delays hundreds. Slow drivers are also the unwitting cause of many accidents by making it necessary for overtaking motorists to cut into the opposing traffic stream to pass."

The Erskine Bureau has completed an extensive survey of street traffic in Chicago which discloses a typical set of obsolete laws, that according to the report were obsolete ten years ago. "Their chief service," says Dr. McClintock, "is to permit technically inclined public officials of some of the small cities of the Chicago region to levy unwarranted toll on the motoring public."

One of the recommendations in the Chicago survey abstracted in the *ELECTRIC RAILWAY JOURNAL* Jan. 8, 1927, will be to urge the state legislature to pass laws that will permit the city to enact ordinances regulating minimum as well as maximum limits on the streets.



The Cleveland Terminal of the Cleveland-Warren-Youngstown Coach Line is at 2133 East Ninth Street, Not Far from the Center of the Business District



This Exterior View of the South Shore Line's New Dining Cars Shows in Beauty with the Interior of the Car. Streamlines and the Orange Color Enhance the Mechanical Perfections

South Shore Line Starts Dining and Parlor Car Service

Pullman Built Equipment Now Operating Between Chicago and South Bend, Ind., Provides Most Modern Facilities and Comforts for Windy City Passengers—Seven Thousand View Cars During Six-Day Exhibit Trip

REGULAR operation of the new all-steel parlor-observation and dining car equipment of the Chicago, South Shore & South Bend Railroad between Chicago and South Bend, Ind., was inaugurated on Feb. 20, following a six-day exhibition of a train made up of the four new cars in the larger towns along the company's lines. The number that visited the cars during the public showing was estimated at more than 7,000 persons.

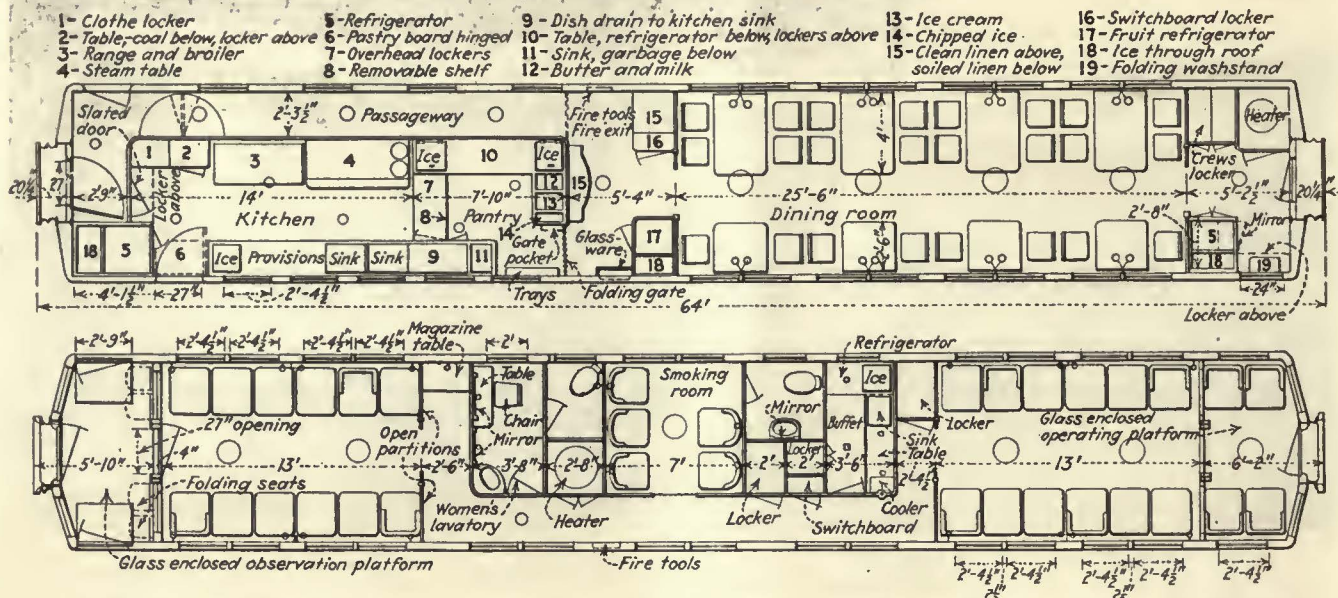
Names significant from the standpoint of the localities served have been chosen for the three dining car and two parlor-observation car trains that now operate in each direction daily. The dining car trains leaving Chicago at all mealtimes are known as the "Notre Dame Limited," "Indiana Limited" and "St. Joe Valley Limited." Parlor-observation trains in this direction in the forenoon and mid-afternoon are the "Duneland Limited" and "Marquette Limited."

The new cars, which were built by the Pullman Car & Manufacturing Corporation at a total cost of \$185,000 and delivered to the railroad late in January, are of standard steam road Pullman car dimensions. Each car is equipped with six-wheel trucks, said to be the first of their type operated on any electric railroad in this country.

Finished with walnut woodwork, the parlor cars, 64 ft. x 10 ft., have glass-enclosed platforms at each end; they are furnished with comfortable folding chairs, and are heated by automatic electric radiators, while full-length windows afford an unobstructed view to the rear. The cars are arranged with the men's and women's lavatories, kitchen, switch cabinets and other appurtenances in the center, thus providing a parlor compartment at each end, next to the observation platform. A built-in writing desk and magazine table is located in each compartment. Every comfort has been provided



Exterior of South Shore Line's New De Luxe Parlor-Observation Car Showing Six-Wheel Truck Innovation and Glass-Enclosed Observation Platforms



Great Care Has Been Exercised to Arrange the New Cars Conveniently. Above, the Diner; Below, the Observation Car

for feminine passengers in the women's retiring room, which is attractively furnished with a small boudoir table, a full-length mirror and several smaller mirrors. Special care also has been exercised in equipping the men's lounging room.

Designed for buffet service only, the kitchen is a model of compactness. In its small area an ice box, sink, electric heater, humidor, water cooler and various cupboards are included. Among other interior decorations are dome ceiling lights, handsome side fixtures, two large electric fans and deep plush carpets.

Longer than any equipment now in service on the South Shore Line, the new diners, 64 ft. x 10 ft., are designed to serve 24 persons at a time, the seating arrangement conforming with that in vogue on the steam roads. The color scheme for the interior is green, decorated enamel, which is enhanced by dome ceiling lights, plush carpeting, and individual lighting fixtures over the tables. The kitchen compartment is designed for the maximum speed in serving, and besides the customary range there are several refrigerators, cabinets for linen, china, silver, provisions and fruits, three sinks and several large electric fans. Egress and ingress are obtained through centrally spaced doors as in

the case of the steam road equipment. Rounded ends, streamlines and the striking orange color, standard for the South Shore, are some of the exterior features.

More than 125 newspaper men, city officials and other prominent residents of South Bend, Michigan City, Gary, Chicago and other cities reached by the South Shore Line were guests of the company on an official inspection tour in the new cars on Feb. 10. Aboard the train were Britton I. Budd, president of the railroad; B. J. Fallon, C. E. Thompson and H. M. Lytle, vice-presidents; Charles H. Jones, general manager, and other officials of the company and affiliated railroads and Charles Gordon, editor of ELECTRIC RAILWAY JOURNAL. The new de luxe limited trains now supplement the regular hourly express service between Chicago and South Bend and the half-hourly service between Chicago and Gary.

Incidentally, since the South Shore line has been under the control of the Insull interests, during the last two years \$4,500,000 has been spent in rehabilitation of the property and an additional \$2,000,000 will be spent in the next twelve months. Twenty-five new steel passenger cars have been placed in service and twenty more cars will be added during the summer.



Interior of Parlor-Observation Car Which Reveals Corridor Around Butler's Pantry and the Lounging Rooms for Male and Female Passengers



Dining Car Patrons Will Now Enjoy the Modern Appointments as Shown in This Interior Perspective. Decorated Green Enamel Is the Color Scheme

Headway Recorders Centralized in Dispatcher's Office at Denver

By Nelson R. Love

Chief Engineer Denver Tramway, Denver, Col.

**Continuous Check Provided on Operation of Ten Car Lines—
High Voltage Spark to Burn Paper Is Used Instead of Ink
—Single Wire Suffices for Registering in Two Directions**

HEADWAY recording apparatus, arranged to register separately the time inbound and outbound at which cars pass given points on ten lines, has been installed in the dispatcher's office of the Denver Tramway. This centralization of equipment permits a continuous check-up by the dispatcher. Each route of the Denver Tramway is equipped with a telephone connecting with the dispatcher's office, located at approximately the center of the system. Cars are operated on printed schedules that are in the hands of all trainmen, but if any car is more than three minutes late the motorman reports to the dispatcher at the end of the line. Thus the dispatcher is able to issue such orders as may be required to operate the line to the best advantage under the circumstances. The method of dispatching used in Denver was given in detail in an article in this paper for Aug. 23, 1924, page 275.

For recording headways the apparatus used is a continuous strip-chart type of instrument, with spaces for twenty indications. One is used for the outbound cars and one for the inbound cars on each of the ten lines at present connected. The chart speed is 6 in. per hour, or 0.1 in. per minute, making one-half minute variations in time readily distinguishable. An accompanying illustration shows the arrangement of the headway recorder on the dispatcher's desk. It will be noticed that the chart passes over the top of the desk with approximately three hours of chart visible at all times. The dispatcher marks the schedule time for each car in red on the chart as it passes over his desk, thus showing up immediately every car not on time.

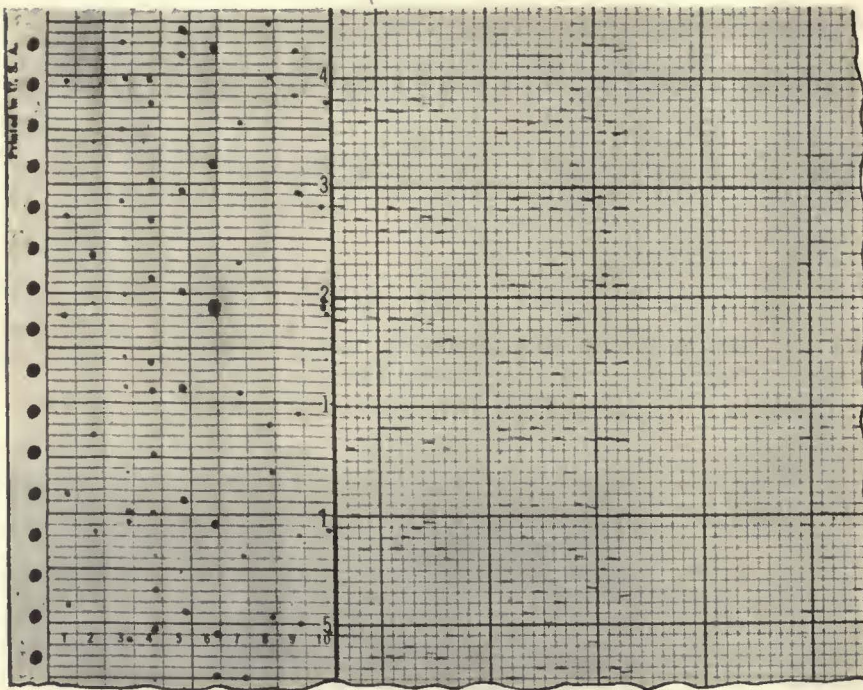
The time scale employed on the chart renders the transfer of the daily chart record to a comparative line record a simple matter by using standard cross-section paper ruled ten lines to the inch in sheets 20 in. wide by 9 ft. long. This sheet suffices for recording 90 days' performance of one line, showing Saturdays, Sundays and week days, inbound and outbound, separately at the right. A portion of one of these records is reproduced. The mark at the extreme left of each series of days is the time at which the car is due.

One clerk is able to take care of all of this work. The process of transferring the record consists in folding the original chart so that the line desired is at the edge. This is laid on top of the permanent record, alongside of the column for the day involved, and the time scale matched properly. The clerk then makes a mark for each mark on the chart, without reading or interpreting either the original or the new mark. About twenty minutes is required to transcribe the record for one line for one day.

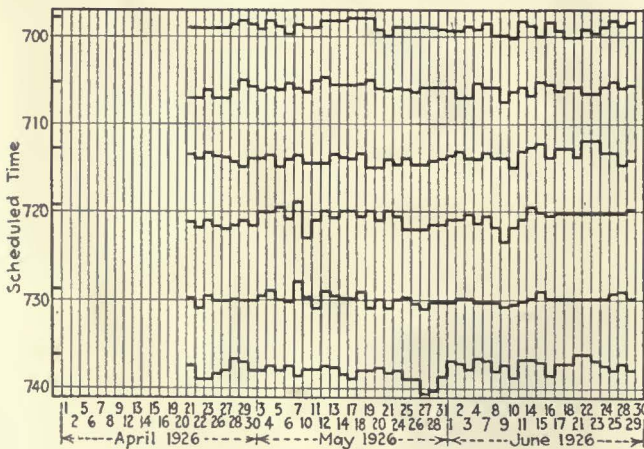


Chart, on Which Are Registered the Headways on Ten Car Lines Operated by the Denver Tramway, Passes Over the Dispatcher's Desk

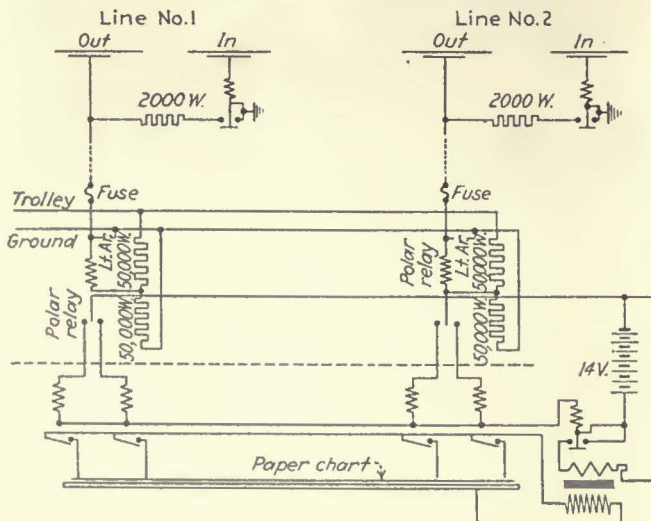
As originally set up, the recorder used capillary pens, each pen tracing a continuous line on the chart, and each car passage causing a horizontal offset to appear in the line. On account of passing over the dispatcher's desk, this method of marking the charts proved unsatisfactory. Various combinations of ink were tried. Oil would not dry at all. Water dried so quickly that the pens clogged. Alcohol made the ink run so freely that it dripped. Glycerine and water did fairly well, but would not dry completely. When the glycerine con-



Original Headway Record Made by Electric Spark (at Left) Placed Alongside a Large Sheet of 1-In. Cross-Section Paper (at Right) for Compilation of the Comparative Chart



Portion of Weekday Headway Record for One Line in One Direction for Three Months. The Schedule Time of Each Car is Shown at the Left



Wiring Arrangement by Which Inbound and Outbound Cars Register Over the Same Wire

tent was kept down, the paper buckled from expansion, and so on. Finally the use of ink was given up entirely and an automobile spark coil was pressed into service. This has operated with no trouble whatever, each car passage being registered by a small round hole burned in the chart. It has black edges and so is readily visible on either a white or black backing.

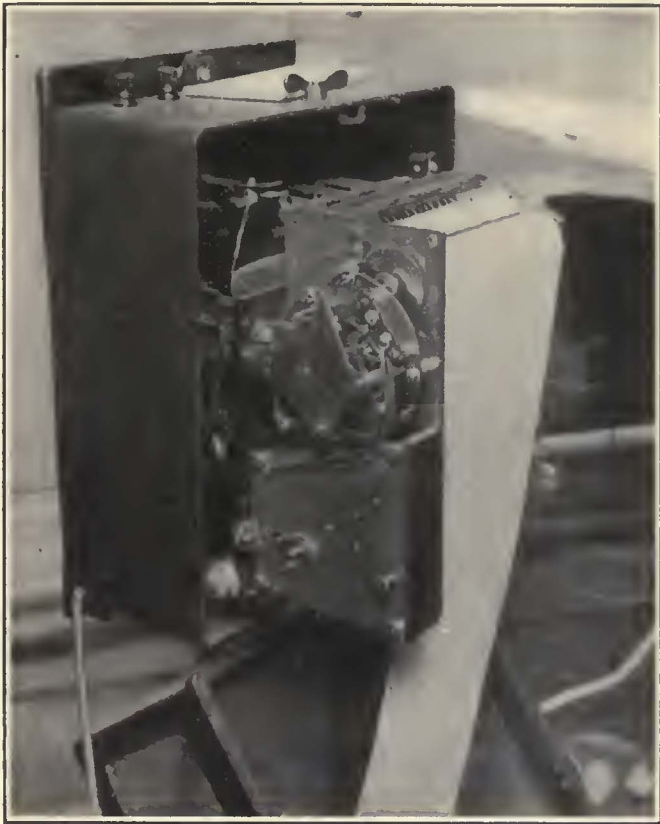
The paper drive is operated electrically with a contactor on the pendulum of the master clock located in the dispatcher's office. This insures synchronism of time by which cars are dispatched and the record made by the automatic recorder. The master clock being a high-grade instrument with a mercury compensated pendulum, the error in the chart drive is only a few seconds per week. This is much smaller than the accuracy with which the chart can be read, and is not cumulative, as the paper chart must be renewed and the chart set anew each week. The driving mechanism consists of a 60-tooth ratchet

wheel driven by an electromagnet energized once each second by the master clock. The ratchet wheel moves forward one notch upon release and is geared to the paper drive roll to give a chart speed of 6 in. per hour.

An interesting feature of this installation is the transmission of separate indications for outbound and inbound cars over the same wire. This is done by a polarized relay of telephone type at the recorder end of each wire. Current in one direction closes one contact, and current in the opposite direction closes another contact, operating the recorder itself with a local battery. Reversal of current is secured by connecting one terminal of the relay coil to the midpoint of a 100,000-ohm resistance between trolley and ground. The other relay terminal is connected to the line wire. Outbound cars connect the distant end of each line wire through a trolley pan direct to the trolley. Each inbound car operates a relay from a trolley pan connection, which in turn connects the line wire to ground. In order to prevent short circuit in the event that outbound and inbound cars of the same line strike pans at the same time, a resistance is connected between the trolley contact and the ground contact. This limits the current to about 0.25 amp. in such an event and does not interfere with the sensitive polarized relay used. Lightning protection to each polarized relay is provided by a vacuum type of spark gap arrester, with fuse in the line wire.

The spark to burn the indications in the chart is provided by a Ford spark coil. Its primary circuit is closed by a relay connected in the common local wire to the polarized relays, so that when one of the latter is operated the flow of local current causes a spark hole. The spark is distributed to the proper position on the chart by using the pens of the chart as relays to close the proper high-tension circuit through the appropriate spark gap, utilizing the movement of the metal pen to close a gap in the circuit.

One coil serves for all indications. If two cars were



Driving Mechanism for the Headway Chart Is Actuated by the Master Clock in the Dispatcher's Office

to cross contactors at exactly the same time, and for the same duration, only one indication could result. The chances of this happening, however, are extremely remote. Up to the present this never has taken place. Though two indications have been observed to come in so close together that the coil relay closed only once, two separate indications have always resulted. The wiring diagram for the polar relays, spark coil and recorder coils is reproduced herewith.

An inexpensive 14-volt storage battery supplies local current for all purposes, namely, paper drive, spark coil and recorder coils. This storage battery is charged continuously at a low rate by an electrolytic type of trickle charger, so that the storage cells used are of very small capacity. This battery has given excellent service and found to be ample for the requirements.

First Electric Railway in Oklahoma Celebrates Birthday

THE Oklahoma Railway on Feb. 3 celebrated the 25th anniversary of establishment of street car service in Oklahoma City, Okla. The Metropolitan Railway, which afterward became the Oklahoma Railway, was the first electric railway established in Oklahoma. It started with less than 6 miles of single-track railway and has expanded until it now has 65 miles of track within the city limits as well as interurban lines.

Lawrence Paulson, veteran operator, now on the El Reno interurban line, was at the helm of the first street car that operated in Oklahoma City 25 years ago. The city declared a holiday to see the strange phenomenon. Crowds lined the streets and cheered. Bolder spirits swarmed inside and others, unable to get inside, climbed to the roof and hung their feet over the sides.

Automatic Reversing Bow Collector

One-Man Operation of a Small Shifting Locomotive Has Been Made Possible by Designing a Bow Trolley that Will Reverse Automatically

FOR handling passenger trailers in the yards and shops, the Toronto Transportation Commission uses a small locomotive which is called a "shifter" or "shunter." This railway operates 258 trailers in its passenger train service. Due to the number of these it has been found most economical to have the special car, since the movements are usually quite short and reversing is very frequent.

An automatic reversing trolley was found desirable so that the locomotive could be operated by one man. As a result, the car is equipped with a bow collector of quite novel construction and quite different from the usual form of pantograph. When the car is reversed the



The Bow Collector Is Shown in the Trailing Position on the Car Used for Shifting Trailers

direction of the bow collector automatically changes without breaking contact or without attention from the operator. In changing from one position to another, the supporting mechanism, which is ordinarily held in operating position by springs, is caused to depress against the spring action and thus provides space so that the bow collector will reverse and still keep uniform contact against the trolley wire at all times.

The use of a collector of this type has several advantages over the ordinary collector for this particular

type of work. The locomotive is used only to shift trailers. The fact that the collector cannot leave the trolley wire results in a considerable saving in time, labor and maintenance, since it is unnecessary to have a second man to handle the trolley pole.

Some minor changes were necessary in the overhead construction in order to provide for the use of this bow collector. It was necessary to have the trolley wire at quite uniform height and this does not vary by more than a foot between highest and lowest positions. It was also necessary to reverse the single and double-curve pull-overs, so that none of the overhead would be below the plane of the trolley wire. The standard trolley frogs, cross-overs and section insulators work equally well with the bow collector as with the standard trolley wheel.

Huntington Completes New Trainmen's Rooms

NEW quarters designed to provide means for recreation in off hours have been provided by the Ohio Valley Electric Railway, Huntington, W. Va., for its employees. These rooms are in the same building with the general offices and directly across the street from the company's Huntington car station.



A Corner of the Main Floor Used for Basketball and Assemblies in the Recently Completed Trainmen's Quarters of the Ohio Valley Electric Railway at Huntington, W. Va.



On the Balcony of Huntington's New Rooms Devoted to Trainmen Are Pool and Card Tables. To the Left Are Seats Overlooking the Main Auditorium Floor.

A large room that can be fitted out as a gymnasium is provided for basketball, dancing and other general assemblies. On a balcony at one side pool tables are provided and several rows of steps or seats which will accommodate a small audience.

The Readers' Forum

"Motormen's Badges Are Poor Advertisements for Heavy Interurbans"

SAN FRANCISCO, CAL., Feb. 26, 1927.

To the Editor:

Years ago practically all interurban electric lines were nothing more than extended street car roads, frequently using city equipment. No one seriously regarded them as main line railroads. The steam roads thought them more or less a joke. Some of these interurbans, however, have changed with the years. They have come to realize that their service and equipment must be brought up to the standard of the steam railroads.

Changing from extended street car line to heavy electrified main line has cost many millions of dollars. Street car methods were dropped, because the public would not stand for a street car on a 50-mile run. But, strange to say, one relic of the past has remained. His name is Mr. Motorman, or "Scissorsbill," as the steam roads call him.

Generally he is made conspicuous by a badge. If a sign were painted on each interurban coach, sleeper or diner reading, "This is a street car line," it wouldn't have any worse effect on public opinion than does the motorman's badge. Why? Simply because "motorman" is a street car word. It is out of place in heavy interurban service. The public is used to coupling the word "engineer" with railroads. If electric interurbans would use the title when referring to their motormen it could not but be beneficial.

Almost any one can be a "motorman" after a couple of weeks training, but a locomotive engineer is different. The public has learned that he is a highly trained man, and he is. It takes almost as long to train an interurban motorman as it does a steam railroad engineer, but few people know this, because they usually think of only one kind of motorman—the street car motorman.

Personally, whenever I ride on one of the electric lines that designates its trainmen as "motormen" I cannot help but wonder how safe the man is, or how long since he was promoted from city service. Surely if this feeling is shared by many, a motorman's badge is not a good advertisement. I believe it would be a good idea for the heavy interurbans to abolish the motorman's badge and adopt an engineer's badge. That is the practice in the West on heavy interurban lines owned by steam roads.

If the steam roads can designate a man as "engineer" at the controller, so can the electric lines. Many of the latter have abolished the blue uniform for interurban motormen and adopted in its place a locomotive engineer's outfit—overalls and jumper. Motormen on such lines haven't swelled up and asked for more pay. Neither would they if they had engineers' badges. Interurban motormen, as a rule, are highly intelligent men and they do not expect standard steam road pay, but they do not like to be known as motormen, as I have found out by talking to several of them.

I believe also the use of gongs in motormen's cabs instead of air whistles cheapens the road in the eyes of the public. Ding! Ding! let's go, street car! The street

car foot gongs are bad; use the air whistle and be a railroad. A locomotive bell attached to the roof is another good thing to dispel the street car impression.

AN INTERUBRAN PATRON.

Older Cars Should Not Contrast Too Greatly with Recent Purchases

UNION STREET RAILWAY

NEW BEDFORD, MASS., Feb. 10, 1927.

To the Editor:

If we are to continue to exist as a transportation agency, and I firmly believe that we are, we must devise methods of attracting more patronage to our vehicles. Economical operation, while in itself of great importance, is not derivative of increased gross incomes. Our vehicle, whatever its kind, must be sufficiently attractive to invite patronage. Otherwise individual transportation units are bound to be used. One way to secure this increased patronage is by the operation of modern, attractive rolling stock. Careful consideration of modern cars makes one realize that they produce more intangible than tangible benefits. Even though up-to-date cars may not bring immediate large increased receipts, it is certain that the continued use of old, untidy cars will not encourage new traffic and will, as a matter of fact, discourage more and more of the present riding.

The general public is not willing to buy the same kind of merchandise for any length of time. Styles are continually changing and merchants are constantly endeavoring to satisfy the demands of their public. With this desire for new things uppermost in the minds of our patrons, it is no wonder that they expect us to improve and there is no better way of calling our improvements to their attention than by keeping our rolling stock up to date. The private automobile has taught people to enjoy a more comfortable method of transportation, and if we are to encourage this class of patronage we must appeal to them from the standpoint of service and comfort, as well as from the economical side of the question. Street cars are of a size and construction that afford greater opportunities for producing a more finished piece of workmanship than is possible to obtain in the smaller transportation units.

In New Bedford attractive and efficiently maintained rolling stock has done more to develop a spirit of friendly co-operation between the public and the company than any other individual item. For years cars have been painted or varnished every year, and a very thorough system of cleaning has been followed closely. No matter how attractive and comfortable new cars may be when delivered, their benefits will be short-lived if not accompanied by a very thorough system of maintenance and cleaning. Plush seats will not remain attractive very long unless they are cleaned nearly every day. It is also important that our de luxe improvements should be practical and easy to keep clean, as well as be attractive.

New appliances have been added from time to time to the existing rolling stock in New Bedford, so that there is not a great contrast between the older cars and those recently purchased. The public judges a railway's physical condition more from its complete complement of rolling stock than from a few pieces of equipment that were recently purchased.

It has been our endeavor to have our cars operate as quietly as possible and as a means to this end we have

given special attention to the proper maintenance of our car trucks. Bearings, gears, wheels, journal boxes, brake riggings, etc., have been inspected and repaired constantly so that they would not produce rattles when the car was in motion. The track has also been efficiently maintained so as to give a very smooth ride; in many instances smoother than that obtained by the best of motor coaches.

In the last analysis it remains for the "men who man the cars" to sell our "product." The training and supervision of this personnel is very important, and the use of a modern training school, full-time instructor and several supervisors have played an important part in developing an efficient corps of transportation salesmen. Friendly co-operation and a thorough follow-up have been the secret of our success along this line.

HAROLD E. POTTER,

Assistant Superintendent of Transportation.

Popular or Mass Transportation?

MOUNT VERNON, N. Y., Feb. 16, 1927.

To the Editor:

'Twill be recalled that when Miss Julia Capulet learned that her Romeo was of the hated Montague clan, she cried: "What's in a name—a rose by any other name would smell as sweet."

So does one feel with regard to the efforts being made to foist new words on the public in cheerful disregard of the fact that most really popular words like "trolley," "jitney," "wow" and "movies" are the inspiration of the man in the street and not the perspiration of the press agent in the office.

You can call a morgue a "mortuary chapel," but the corpse is just as dead in his "casket" as in a coffin. The slithering wight who dresses him for eternity is still an undertaker or funeral director rather than a something rhyming with logician and mathematician.

A barber is still a hair-cutter who barbs and bobs—not a person addicted to tonsils. The alligator pear will taste no sweeter for being called by a name suspiciously like "advocate" in Spanish. And now the dentists want to be called gnathists, which makes us gnash our teeth.

A bus is a bus and a coach is a coach despite the effort to identify a lower form of street car with the luxury of an enlarged limousine.

Coming still closer home, know ye that since the horse car disappeared the ELECTRIC RAILWAY JOURNAL has tried to encourage the use of "carhouse" or "car station" for "carbarn," but even the younger generation sticks to "barns."

It may be that "mass transportation" carries implications of wretched service and poor equipment. However, in the writer's judgment, this term is rather a technical one used among ourselves to express the handling of business *en masse* as distinguished from transportation of small groups at special fares and under special conditions. To substitute "popular" for "mass" would rob the term of its precise meaning. Which is more popular if you have the price: A public utility car or bus, or a private motor car? Let us say directly to the public: "This Is Popular Transportation" only when we are doing something to make it more beloved, whether in fares, in service or in quality of equipment. This writer, for one, sees infra-red when a high-falutin' name beplasters a low-down object. Shades of "Euphues"!

WALTER JACKSON.

Maintenance Notes

Motor Rheostats Installed on Car Roofs

Maintenance of motor rheostats was a large annual expense to the Jamestown Street Railway, Jamestown, N. Y., until J. L. Conner, superintendent of motive power, removed them from beneath the car and reinstalled them on the roof. Broken grids and grounded rheostats were a source of continual trouble when the rheostats were located beneath the car. Although suitable splash guards were installed



Trouble with Resistors Has Been Eliminated by this Car Roof Mounting in Jamestown, N. Y.

between the rheostats and the truck wheels, the mud and water entered, causing insulation breakdowns and burnouts, with resulting road delays. Also foreign particles were being continually picked up and deposited against the grids, causing breakage.

To eliminate this source of failure the rheostats have been reinstalled on the roof of the car. They are mounted on a piece of 1-in. asbestos lumber, fastened to the trolley board through suitable porcelain insulators. Protection from the elements is afforded by $\frac{1}{8}$ -in. sheet metal plates fastened securely to 2-in. vertical steel angles, forming a box around the rheostat. These angle posts are bolted to the trolley board. The side plates are so installed as to permit of free air circulation and heat dissipation by leaving openings near the top plate and the trolley board. The cover plate is fastened to the vertical post. It is sloped to cause deflection of rain and snow.

The cost of labor and material was approximately \$50 per car. The company claims that these rheostats have not needed a penny of maintenance expense since they were in-

Neglect your maintenance, and equipment upkeep, And you're on the "One Way Street," to the scrap heap.

stalled in their new location, and therefore they consider the expense of the installation was a very good investment.

Fire Equipment Location Shown by Striking Colors

Locations of fire extinguishers and sand pails in the shops of the Grand Rapids Railway, Grand Rapids, Mich., are painted red with a yellow border. These colors can be seen at a considerable distance and are sure to attract attention. Each fire station is numbered and a man is assigned to each particular station. For convenience, many of these are located on posts throughout the building. An accompanying illustration shows such a fire station.



Fire Station Located on Central Posts in the Shops of the Grand Rapids Railway

In this case the number for the fire extinguisher is 55 and that for the sand pail 56. A small shovel is also used as part of the equipment for spreading sand.

Compressor Outfit on Bus Chassis

USE is made by the Los Angeles Railway of a standard White 15-45 bus chassis for mounting a large size portable air compressor outfit. The chassis, about to be scrapped by the way and structures department

and with some minor modifications fitted for its new duties. Additional springs were placed on top of the regular springs at the rear. The pneumatic tires and wheels were replaced with solids of the same type as those used on double-deck buses.



Portable Compressor Outfit Assembled in Bus Chassis by Los Angeles Railway. Boxes on the Sides Hold Various Air-Operated Tools.



At Work with Air-Operated Tamping Tools on a Double-Track Crossing. The Air Used Is Furnished by the Portable Outfit Mounted on Bus Chassis

The compressor unit, consisting of an Ingersoll-Rand 245-cu.ft. pump driven directly from the trolley by a 600-volt motor, is carried on a channel sub-frame. This in turn is fastened to the main frame. The size of the chassis allows for a generous spacing of the several parts as well as the installation of tool boxes on the sides and a hose reel on the rear. This reel is inclosed in a sheet metal cabinet having double swinging doors which open to the rear. About 200 ft. of air hose can be carried on the reel, which has a diameter of 18 in. and a length of 30 in. with 30-in diameter flanges at the ends. The shaft of the hose reel extends through the side of the cabinet to take a cranked handle for winding in the hose.

On top of the outfit is carried a folding arm for making contact with the trolley. This is made of 3-in. x 2-in. ash jointed about 6 ft from its upper end. It is fastened to the top rear edge of the hose reel cabinet by a bracket and pin. The point of attachment is about 3 ft. from the lower end. The pin allows the boom to be raised by depressing the end which extends to the rear. The upper end is fitted with a piece of bare trolley wire, which is connected through jumper cable to the controller of the motor.

When down, the boom is folded back on itself and rests on a bracket support on the roof at the forward end of the compressor outfit. On the job, the folded boom is raised, the upper portion extended by a rope and the bare contact wire placed against the trolley. The weight of the boom maintains the contact.

Tool boxes on the sides are made of 3/4-in. wood sheathed with sheet metal. They are of such size as to

hold conveniently the air tools used for tamping ballast and other operations for which the air outfit is used. The metal covering protects the boxes and also gives a finished appearance.

Another feature of the installation is the air-distributing manifold with its six operating outlets. A piece of 2 1/2-in. pipe is brought out of one end of the air tank and carried in a double bend back to the compressor frame base. Here the manifold, made of 3-in. steel tubing, is supported by brackets on the base of the compressor. The supply pipe enters one end of this manifold. The other end is closed. The service outlets, spaced on about 4-in. centers, leave the top of the manifold. A valve controls each outlet.

This installation on a bus chassis has proved so satisfactory that the department now has under construction an electric track welding outfit on a similar chassis.

Axle-Bearing Maintenance Decreased

CAREFUL analytical study of motor axle-bearing maintenance expense on the Danville Traction & Power Company, Danville, Va., indicated that a very appreciable saving could be obtained if a bearing having a high percentage of zinc was adopted as standard.

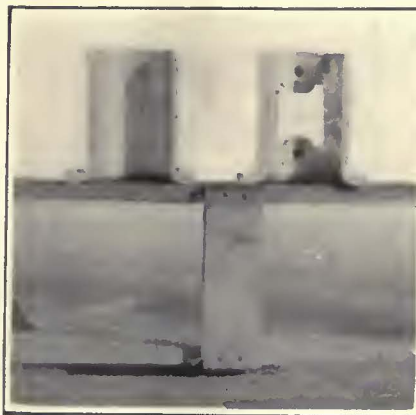
The annual expense of axle-bearing maintenance formed a major portion of the total annual motor expense, as considerable trouble was experienced with axle-bearing breakage. Practically all of these broken bearings had to be scrapped and new bearings substituted. Some of these broken bearings were practically new, whereas others were only half worn out. Nevertheless, it was found necessary to scrap them due

to the character and location of the breaks and the expense of making repairs.

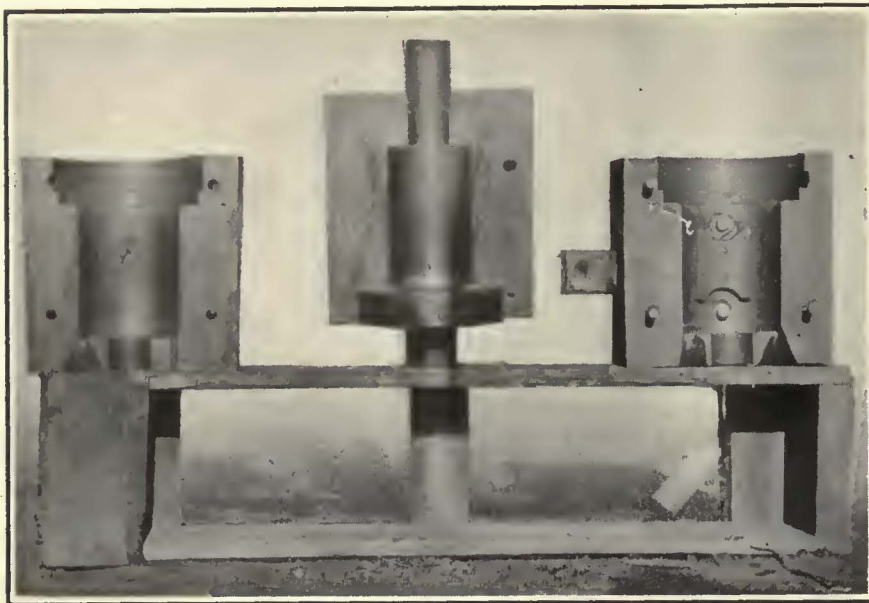
Experiments were started on the axle bearings of the GE-265 motor. A three-section steel mold was made in the shop. Careful consideration was given to the expansion and contraction factors of this mold, together with the shrinkage of the bearing metal, in order that a bearing could be removed from the mold and placed in service without any machine work other than slight filing of the edges. This mold is of rugged construction and is provided with heavy straps and dowels, so that the parts are held together accurately when assembled for the pouring of the metal. Provision is also made for casting the bearing waste window and dowel holes.

Bearings with various combinations of zinc, copper, tin and aluminum were cast and tested in service. After several trials, it was decided that the most satisfactory composition for toughness, non-breakage and long life was 75 per cent zinc, 5 per cent copper, 10 per cent tin and 10 per cent aluminum. All of the GE-265 motor axle bearings have been equipped with bearings of this composition. Results obtained have been far better than was expected.

It is stated that two men can manufacture twelve sets of these



Set of Composition Axle Bearings Removed from Mold and Ready for Service



Appearance and Construction of Three-Section Mold Used for Manufacture of Axle Bearings

bearings an hour and that the bearing maintenance expense has been reduced 75 per cent since their installation. All broken or worn-out bearings are cleaned thoroughly and remelted for the manufacture of new bearings, so that little or no waste is experienced.

The results that have been obtained have been so encouraging that it is proposed to install these bearings on all motors in operation on the property.

Don't be a dead one, and have them "Say it with flowers," Oil, inspect and overhaul your cars based on consumed power.

Transporting Car Trucks with Broken Axles

SERVICE interruptions caused by broken axles have been reduced to a marked degree on the property of the Virginia Electric & Power Company, Richmond, Va., by the use of a dolly truck designed by the master mechanic, W. S. Hicks, and constructed in the shop. This truck consists of a pair of 11-in. flanged wheels with a 4-in. face, mounted on a 3-in. axle. Two pedestals are clamped to the axle and arranged for the support of the end of the truck frame. The body of the pedestal consists of an oak block about 17½ in. long, 6 in. wide and 4½ in. thick. The

upper part of this block is notched to receive the steel angle frame of the truck and the lower end is fitted to the upper half of the axle clamp. A steel plate mounted on the top of the block provides a means for holding the truck frame angle rigidly in place. Two ¾-in. x 2½-in. flat bars, rounded on the ends and threaded, fasten the axle clamp to the axle and the truck angle frame to the pedestal. Two ¾-in. through bolts prevent splitting of the oak block and at the same time prevent shifting of the various parts. With the pedestal axle clamp fastened solidly to the dolly axle and the end truck frame angle set in the oak block slot and clamped down by the ½x4-in. plate a solid support for the truck is provided which permits skidding it to the place desired.

This equipment has afforded a means for rapid transportation of the car with the broken axle.



Mica Undercutter Reduces Labor Costs

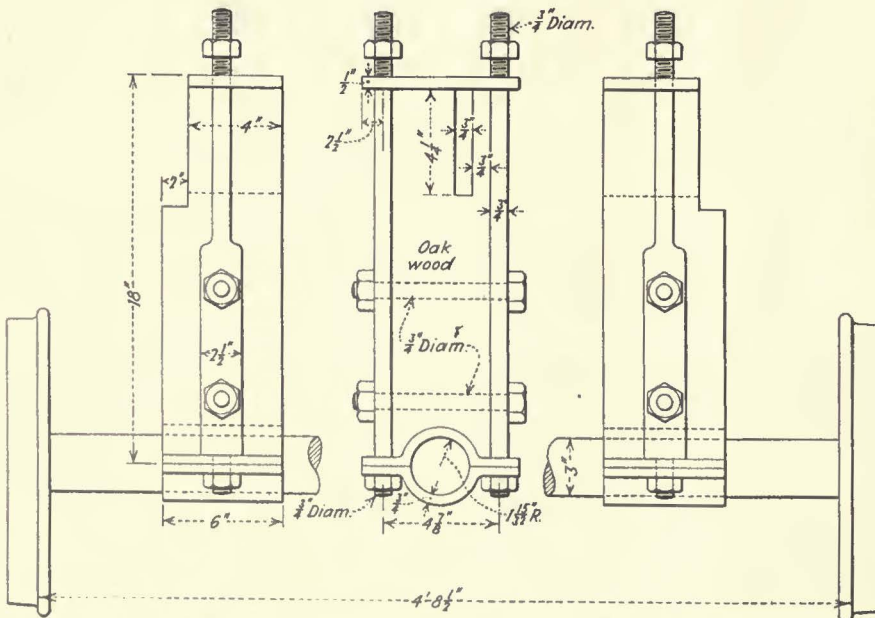
USE of a cutter of only ⅜ in. diameter to facilitate ease in guiding and cutting commutator mica is a feature of a new electrically operated portable mica undercutter manufactured by the Hullhorst Micro Tool Company, Toledo, Ohio. This undercutter is sturdy and compact in construction and simple in operation. It can be operated at rapid speed by an unskilled man. An in-



Portable Undercutter, Operating Handle and Other Details

experienced workman can undercut mica to a depth of ⅜ in. with this machine at a speed of 100 to 200 ft. per hour. The width of cut depends on the thickness of the cutter.

The machine is driven by a Westinghouse motor and can be operated from any 110-volt lighting circuit by means of the attachment cord and plug. It is carried easily from one place to another by means of a case supplied with a leather handle.



General Appearance of Assembled Dolly Truck. In Center, Appearance and General Dimensions of a Pedestal

Association News & Discussions

Central Traffic Meeting at Indianapolis

IN ACCORDANCE with the action taken at the last meeting of the Central Electric Traffic Association, the next regular meeting will be held at Lincoln Hotel, Indianapolis, Ind., on March 16 and 17, 1927, beginning at 9 a.m. Wednesday morning's session will be in the nature of a round-table discussion. Necessary committee work will be done the afternoon of March 16. The Thursday session will be devoted to reports of committees and such other business as may be properly presented.

Hotel reservations should be made with the Lincoln Hotel direct.

Southern Equipment Men Admit Manufacturers

MANUFACTURING companies or manufacturers' agents handling equipment or materials used by street railway operating companies may now be admitted as associate members of the Electric Railway Association of Equipment Men, Southern Properties. At the recent meeting of that association held in Memphis the by-laws were changed accordingly.

Dues for these associate members are fixed at not less than \$10 per year, payable Jan. 1 for the ensuing year. Manufacturers or their agents wishing to become members should make application to the secretary of the association, A. Taurman, 2100 First Avenue, Birmingham, Ala.

American Association News

Rapid Transit

GENERAL discussion of rapid transit problems existing in the larger cities of the country took place at the meeting of the committee on rapid transit of the American Electric Railway Association held in New York on Feb. 25. An interesting point developed was that while rapid transit presents many peculiar problems individual to the local community, certain fundamental thinking should soon develop on principles. This should be set forth to guide cities facing the rapid transit situation in the coming few years. Managers of transportation companies in those American cities just below the fifth and sixth in size should have available fundamental data relative to types of systems, methods of financing and physical construction. These include relative advantages of two-track

versus four-track tubes, minimum width of street to accommodate each and the economic conditions necessary for the various steps in the development of rapid transit business.

Members present were G. A. Richardson, chairman; D. L. Turner, Edward Dana, S. E. Emmons, R. E. Kerins representing J. S. Doyle, J. B. Stewart, Jr., Thomas Fitzgerald, E. J. McIlraith, R. F. Kelker, Jr., C. A. Burleson representing H. L. Andrews and H. E. Ehlers.

Special Rolling Stock Committee No. 2

DISCUSSION of essentials to be considered in the standardization of motor coach design and rules for inspection and maintenance of buses occupied the attention of special rolling stock committee No. 2, which met at association headquarters, New York, Feb. 7. Those present were V. W. Berry, chairman; H. C. Eddy, F. A. Klock, L. H. Palmer, T. L. Preble, A. J. Scaife and C. W. Stocks.

At the afternoon session G. H. Scragg, International Motor Company, who is also chairman of a committee formed to study and recommend uniform specifications for standard motor buses, was invited to describe the results which were being accomplished by his committee and work which they contemplated. He outlined a plan for a code of uniform requirements governing bus construction and explained that the work of his committee was sponsored by the N.A.C.C., which would print the final draft of the report. The report as at present outlined consists of five parts: (1) An introductory chapter giving general developments of the bus and looking forward to interstate regulation in 1928; (2) an analysis of the outstanding conflicts in the various state laws which have been analyzed to show how concessions can be made; (3) a discussion of every phase of regulation, both known and anticipated; (4) code of recommended practice to make possible the utilization or standardization of vehicles both as to size, weight and other requirements for the safety of passengers; (5) a complete index.

To avoid duplication of effort and save time, it was considered desirable to effect a close-working arrangement with Mr. Scragg's committee. This is to be done through Messrs. Stocks and Plimpton, each of whom is a member of one of these committees. Mr. Eddy, who is a member of the staff of the Board of Public Utilities Commissioners of New Jersey, explained how the standard motor bus specifications of that body were drawn up and told of the procedure used in reaching agreement. Mr. Eddy explained that there now are two sets of specifications

COMING MEETINGS OF

Electric Railway and Allied Associations

March 8-10—Oklahoma Utilities Association, ninth annual convention, Huckins Hotel, Oklahoma City, Okla.

March 16-17—Central Electric Traffic Association meeting, Lincoln Hotel, Indianapolis, Ind.

March 17-18—Illinois Electric Railway Association, seventh annual joint convention, Hotel Abraham Lincoln, Springfield, Ill.

April 1—American Electric Railway Association, Metropolitan Section, Engineering Societies Building, New York City, 8 p.m.

April 26-29—Southwestern Public Service Association, convention, New Orleans, La.

May 31—June 1-2—Canadian Electric Railway Association, annual convention, Winnipeg, Man.

July 27-29—Association of Equipment Men, Southern Properties, 12th semi-annual meeting, Atlanta, Ga.

Oct. 3-7—American Electric Railway Association, annual convention and exhibit, Public Auditorium, Cleveland, Ohio.

being prepared, one to apply to buses of the city type, single deck, and the other to buses of parlor car design.

With regard to the subject of inspection and maintenance standards, it was decided that questionnaires would be sent out asking for information as to methods that various companies are using. Members of the committee are also to communicate with companies in an effort to develop sufficient information on which to base recommended practices.

Public Service Section

UPWARD of 500 members attended a meeting of Public Service Company section A.E.R.A. on Feb. 18, at Newark, N. J. P. S. Young, vice-president of Public Service, and F. M. Rosseland, secretary-manager of the Newark Safety Council, spoke. Officers for the coming year were elected as follows: President, Philip F. Maguire; vice-president, Howard Briggs; secretary-treasurer, Joseph O'Driscoll; director for one year, William H. Shepherd; director for two years, James M. Symington; director for three years, George L. Walsh; director ex officio, Matthew R. Boylan.

There are now 395 members in the Public Service Company section, an increase of 77 since the gathering held last year in Jersey City.

The News of the Industry

New Franchise Draft in Omaha

A committee of 56, comprising leading business, professional men and labor leaders, has prepared a draft of a new franchise ordinance for the Omaha & Council Bluffs Street Railway, Omaha, Neb., that will be presented at once to the Council, with the request that it be voted on at the general city election on May 3. The franchise drawn by the company and submitted a year ago was voted down.

The new draft provides that the franchise shall run for 30 years instead of 40; that it may not be assigned to any out-state corporation or person; that the state royalty tax of \$1,000 a year shall not be in lieu of occupation or similar taxes which may be assessed; that the Council may order extensions of lines, including bus service; that the company shall pay for paving, resurfacing and raising of track costs when ordered by the Council.

John L. Kennedy, a prominent citizen, who took the leading part in the negotiations, said that this step was necessary in order to save the railway system for the city. Action was vitally necessary this year as the company's \$9,000,000 of bond indebtedness becomes due Jan. 1, 1928. Mr. Kennedy said that if the franchise election failed the city would be confronted with the danger of a receivership and a crippled system of transportation that might involve suspension of operation.

Discussion Put Over Until After Chicago Aldermanic Election

On Feb. 9 the committee on local transportation of the City Council of Chicago held its most recent meeting. At that time Alderman Joseph B. McDonough, chairman, complained of his inability to get all sides into a meeting at one time. It was suggested that three meetings be called on the theory that at one of those three meetings it might be possible to bring all the interested parties in.

A few of the Aldermen were frank enough to admit that they were not interested in traction matters or anything else just then, being in the midst of the aldermanic campaign. A motion to postpone all meetings until after Feb. 22, however, was defeated.

Bankers, traction officials and chairmen of the various bondholders' protective committees are prepared to tackle the situation, after the Aldermanic election. Now it appears that nothing is to be done until after the election on April 5.

Inquiry at the office of the transportation committee elicited the information that no meetings have been called and that none is contemplated until after that date. It is possible that some consideration will be given Mayor Dever's subway plan, but this does not

involve any of the ordinances now before the committee.

Clarence E. Richard, writing in the *Journal of Commerce*, said:

While the city hall seethes with pre-campaign turmoil and Aldermen are busy building their political fences and lining up their supporters for the mayoralty election in April as well as for the run-off between the high men, the traction problem has been lost sight of.

Frequent attempts to get some one to discuss the question met with only puzzled looks—as if the city hall was unaware that settlement day is fast approaching, that the surface lines are now operating on a day-to-day grant that expires in a few months even if the maximum period is used up.

International Schedule Approved

The Public Service Commission on Feb. 24 revoked orders suspending schedules filed by the International Railway on Sept. 16, 1926, making increases in its rates for transportation in Lockport and on the Buffalo-Niagara Falls High-Speed Line and the Buffalo-Lockport-Olcott Divisions, and permitted the company to make the schedules, as filed, effective March 1 and to remain in effect for one year thereafter or until further order of the commission. The new fare in Lockport will be 8 cents. Six cents is now charged. The rate on the two other division will be increased from 2½ to 3 cents a mile.

Hearings were held by Commissioner Fooley in Buffalo and evidence was submitted covering operations in Lockport to Sept. 30, 1926. The commission's accountants allocated the fixed capital of the International Railway to the various communities served by it and also the revenues and expenses. The result of the commission's examination showed an operating deficit in Lockport of \$37,640. The commission holds that the present 6-cent rate in Lockport is "insufficient to yield reasonable compensation for the service rendered and is unjust and unreasonable." The fixed book capital, as allocated to the city of Lockport, was \$1,092,580.

The new mileage rate tariff applies to and from stations on the Buffalo-Niagara Falls High-Speed Line, also from Buffalo and Niagara Falls to Lockport via Division Street in North Tonawanda and to and from all stations between Buffalo and Olcott on the Buffalo-Lockport-Olcott Division, also from Buffalo and Lockport to Niagara Falls via Division Street.

The investigation by the commission brought the examination of the company's books down to Sept. 30, 1926, showing investment in road and equipment and operating results, segregated by localities. This investigation, based on book figures, disclosed an operating income of \$113,488 for the year ended Sept. 30, 1926. The operating income of \$113,488 provides a return of 1.61 per cent on the value of the road and equipment, \$7,035,738, used in giving service on the two divisions.

Seven Cents in St. Louis—Grant Before Voters

The United Railways, St. Louis, Mo., on March 1 returned to the 7-cent fare as a result of the decision on Feb. 25 by a special court of three federal judges at Kansas City, Mo., which held that the company was not entitled to a continuation of the 8-cent fare or two tokens for 15 cents, a rate which went into effect temporarily on Feb. 7. The special court ruled that the federal court at Kansas City lacked jurisdiction so long as the railway's application for increased fare was pending before the Missouri Public Service Commission, inasmuch as the state body had not unduly delayed a decision. Under the terms of the court's ruling the railway is supposed to return to each patron the excess fare charged from Feb. 7 to March 1. The sum so to be returned is not believed to exceed \$3,000 as receipts for extra fare were given to passengers only on request.

The United States District Court at Kansas City had previously issued a temporary restraining order against the Missouri Public Service Commission and other state officers to prevent interference with the charging of the higher rate of fare.

On Jan. 7 Receiver Wells had informed the commission that the company would put into effect the increased fare schedule in 30 days. The commission later suspended this schedule and it was then the company appealed to the federal courts.

The special court pointed out that the state commission had proceeded to examine into the fare situation as expeditiously as its machinery would permit and that the company should not have sought to override this process by filing its arbitrary schedule on Jan. 7. The three judges agreed that there was no evidence of dilatory tactics on the part of the commission.

The commission is expected to complete the audit of the company's books by March 10 and a decision in the application, which was filed June 7, is anticipated shortly after the commission audit is filed.

Mayor Victor J. Miller of St. Louis, Mo., will not officially present to the Board of Aldermen at this session of the board the measure to grant a blanket franchise to the St. Louis Public Service Company, which plans to purchase the properties of the United Railways at foreclosure sale in the near future. The Mayor has already made public the terms of the measure as tentatively drawn following numerous conferences with representatives of the company. It is the present plan of the Mayor to permit the company to propose the bill to the Board of Aldermen or to the voters by initiative petitions. He prefers a di-

rect submission to the people. The company also wants the voters to pass on the measure.

The bill as drawn provides for a 30-year franchise if passed by the aldermen and a 50-year grant if the people approve. The company will operate on the service-at-cost plan under the bill. The time is now too short to get the proposition on the ballot at the municipal elections on April 5. The bill provides that should a special election be necessary the company must defray the cost of holding such election. This would amount to almost \$50,000. The present session of the Board of Aldermen ends on April 11. A new president and fourteen of the 28 members of the board will be elected in April.

Open House in Williamsport— Carnations for the Ladies

During Saturday afternoon and evening, Jan. 22, the new carhouse and shops of the Williamsport Passenger Railway, Williamsport, Pa., were visited by more than 2,000 citizens of Williamsport. The company had invited the public to inspect its new quarters at West Third and Park Streets, and from 2 in the afternoon until 9 at night the place was thronged with visitors.

A number of very interesting and unusual features in the building were explained, and on exhibition were three new cars. On the new cars were signs describing them, and on the old car was a sign calling attention to its dilapidated condition and stating that after all the contemplated improvements were completed the company did not expect to operate cars of that character except in emergencies.

On the walls of the building were signs and charts and one large map showing the new trackwork that was done in 1926 and the cost of each item. Another sign described the "weekly pass," which the company was to put in use under the new fare plan, arranged to go into effect about March 1. Another sign had a large drawing of the metal tokens that will be sold two for 15 cents under the new fare plan and also contained two sample tokens, so that those visiting the exhibit could become familiar with them.

Music was furnished throughout the afternoon and evening by a ten-piece orchestra and coffee and doughnuts were served, the doughnuts being made in a motor-driven doughnut machine in full view of the visitors. Upon entering the building visitors were directed upstairs to the office portion, where women visitors were presented with carnations.

The lighting of the new carhouse was very brilliant and apparently every possible facility has been installed to make convenient the maintenance and repair of cars. Visitors to the building found that much attention had been paid to convenient arrangement and to easy supervision, as practically all partitions are of clear glass, so that operations in any department can be easily supervised.

Saturday evening at 6.30 L. W. Heath, the general manager of the company, gave a dinner at the Lycoming

to the presidents and secretaries of the Rotary, Kiwanis, Lions and Exchange Clubs, Newberry Progressive Association, Merchants' Association, officials of Williamsport and South Williamsport, members of the traction investigation committee, bankers and representatives of the press, and at this dinner Mr. Heath gave a short talk, which he termed "A Report of Stewardship."

He briefly related the real progress to date, since the report of the railway investigation committee was made to the City Council a year ago, and stated that the railway situation in Williamsport and the method followed in improving it, providing better service and facilities, had been termed by railway men "The Williamsport Experiment," because, as far as was known, no other railway had ever applied to the city in the same co-operative way as had the local company, asking that it be investigated by a committee of business men, and that the result of what was being done is being watched with much interest in a number of other cities. Facts and figures were given to show that the railway to date was ahead of the program required of it by the committee's report, which was adopted by the city, and that the company had deferred for a year the increase in fare for the reason that it wished to show the people of Williamsport that it was going to do all that was required of it.

George Frey of the J. G. Brill Company said that the new cars built by his company for the local railway were probably the most elaborate cars they had ever made for city service.

After dinner was over, the party was taken on a tour of inspection to the new carhouse and shops.

"Eight-Foot Law" Reiterated in Brooklyn

Car cards bearing the direct warning from the traffic court against violation of the "8-ft. law" are being carried on both ends of the cars of the Brooklyn

In the same place usually occupied by theater advertisements, motorists following a trolley car see this court announcement, "Obey the Law. Do not pass within 8 ft. of standing car. Avoid jail or loss of license. Traffic Court." Police officials concurred in the idea and promised to conduct a campaign of enforcement. It was said that railways in Manhattan would likely adopt the idea, which took tangible form in Brooklyn on Feb. 21.

Engineers Go Ahead with Plans for Chicago Subway

Completion of engineering plans, costs and specifications for a downtown subway in Chicago awaits only advice from the City Council, according to a recent announcement by R. F. Kelker, Jr., engineer for the local transportation committee of the City Council.

Upon instruction received from the City Council, Mr. Kelker, in company with other city engineers, has been constantly at work for the last ten weeks on a field survey of the plan recommended last August by the citizens' advisory subway commission for the construction of two subway routes under the Loop district; one a rapid transit tube under State Street between Chicago Avenue and Roosevelt Road and the other a low-level loop subway for street cars only under Washington, Michigan and Jackson Boulevards. Having recently completed this survey, upon which it is hoped the City Council will presently frame an ordinance, the engineers are now working on general specifications for any subway plan that may be adopted, especially the difficult rearrangement of sewers and public utility conduits which subway construction would make imperative.

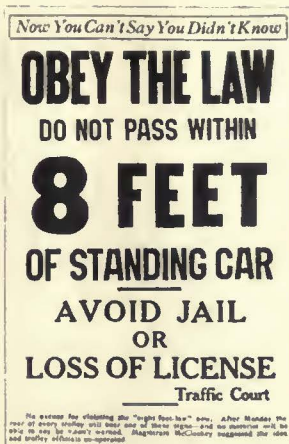
Major Kelker is also studying the possibility of creating a mid-city elevated trunk line in the neighborhood of Ashland Avenue, connecting the Ravenswood and Englewood branches of the Chicago Rapid Transit system and assuring residents of the west side of the city direct north and south transportation without making it necessary to take a circuitous trip through the Loop district.

Mayor William E. Dever strongly advocates immediate construction of subways. He has indicated in recent speeches in his campaign for re-election that he will do all in his power to have a subway ordinance submitted to the voters at the judicial election next June.

New York's Mayor Urges More Money for Subways

Doubt appeared to have been removed on March 3 that the Legislature of New York would pass the resolution to submit the proposed constitutional amendment empowering New York City to borrow \$300,000,000 outside its debt limit to build new subways. Mayor Walker urged the passage of the resolution at the hearing the previous day, but he was no more specific than he has been in the past, merely repeating the 5-cent fare and other political shibboleths handed down from Hylan, the former Mayor.

Late on March 3 a movement devel-



Warning Signs on Brooklyn Cars

City Railroad and the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. This poster was developed at a conference with representatives of the traffic court, the Police Department and the transportation companies in Brooklyn. It was suggested by Magistrate Francis A. McCloskey of Homicide Court and indorsed by railroad officials.

oped to delay the submission of the amendment to the voters until 1928, which will be a Presidential election year. This was started by Senator John Knight, Republican leader of the upper house, who asked Attorney-General Albert Ottinger whether it would be legal to provide for the submission next year instead of at the November election this year.

The Attorney-General gave an informal opinion that the legislature had the legal power to delay submission, the State Constitution providing that a proposed amendment might be submitted in the time and manner that the Legislature might direct.

Attack on Minneapolis Regulatory Act

Should the Brooks-Coleman street railway regulatory act be repealed at the present Minnesota Legislature chaos would result. This was the opinion expressed by Charles B. Fowler, counsel for the Minneapolis Street Railway; Pierce Butler, Jr., counsel for the St. Paul City Railway, and Oscar Mitchell of the Duluth Street Railway, at a hearing before the Senate committee on legislation recently at the Capitol. Proponents of the repeal had their inning a week previously.

The Brooks-Coleman act was passed in 1921. Since then the electric railways of the state have been regulated by the Minnesota Railroad and Warehouse Commission as to issues of stocks and bonds and as to rates of fare.

At the previous meeting a special committee of the Minneapolis Civic and Commerce Association presented the following opposing resolution:

Minneapolis car service is second to none in the United States.

The act was passed after careful consideration by legislators, and citizens and civic organizations.

Before enactment the electric railway situation was constantly injected into politics.

Expense of reaching valuation figures to fix fares would be wasted by repeal.

Fare fixing should be left to disinterested arbitrators.

Since passage of the law differences between the Minneapolis City Council and the railway have been largely composed.

Repeal would lose all that has been gained by such harmony and improvement of service.

Chaos would prevail in the legal status of city and company by repeal.

The three railway attorneys said that repeal would not reinstate the old franchise even if they had not expired as in the case of Minneapolis in 1923. The attorneys for St. Paul and Duluth took the opposite view. Mr. Fowler said the Brooks-Coleman act extends local control over railways. The main object is to provide a workable, practical and equitable method for having a rate of fare determined from time to time as conditions change. The Council represents its constituents and cannot do otherwise. In the very nature of things it must be biased in favor of the citizens. He said further:

To such an extent has this view been adopted that there are 39 states which have public utilities commissions to which much more extensive powers are granted with reference to the regulation and control of utilities within cities than is given by the Brooks-Coleman act.

In case of repeal the company would try to get the highest rate it could. The battle would be on with the city

“Turn Backward, Oh, Time——”

WHILE in New York Mr. Lowry inspected the new invention of Van Depoele & Sprague, which is a horseless car. Motors are built into the floor of the car and by wire are connected with an overhead current which propels the car along a steel track without horses being necessary. Mr. Lowry said: “The car isn't practical yet, but if the inventors ever do get it where it is usable, you can rest assured the system will be adopted for Minneapolis.”

The above statement is part of a clipping taken from the Minneapolis Journal of Feb. 23, 1887, and included in a special edition of the Journal distributed at the fortieth anniversary of the Minneapolis Real Estate Board on Feb. 23 at the Hotel Radisson.

N. B.—Mr. Lowry has ceased to expand the horse lines, but each year renews his faith in the electric lines.

over fares, extensions, improvements, etc. The situation would be worse than in 1921.

The St. Paul City Railway counsel held that repeal would make it impossible to refund \$10,000,000 bonds in 1928 and the result would be receivership. The Duluth Railway counsel said a \$3,000,000 bond issue to be refunded in 1930 would be in danger of finding no market.

Editorials were quoted from Twin Cities and Duluth newspapers opposing the repeal.

A decision is expected soon by the general legislation committee of the Senate.

Free Parking Space at North Shore Stations

Free parking space at stations for the automobiles of customers is the latest feature of service on the Chicago, North Shore & Milwaukee Railroad.

This extra bit of service, started in connection with the railroad's Better Business Campaign, is expected to increase passenger traffic materially. On the Shore Line route parking space is provided at the Milwaukee, Racine, Kenosha and Ravinia stations. On the Skokie Valley route eleven stations provide this service. A special booklet, containing information about this latest innovation of North Shore Line service, has been prepared and is being distributed by station agents.

Completion of First Hole of Moffat Tunnel

President Coolidge, by remote control, set off the blast which broke down the last barrier between the two bores of the preliminary work of the Moffat tunnel on Friday night, Feb. 18, at 8.10 o'clock mountain standard time. Elaborate ceremonies in honor of the event were staged in Denver, conducted by Governor Adams of Colorado and broadcast from radio station KOA of the General Electric Company in that city.

The Moffat tunnel, boring under the Continental Divide, will be 6.04 miles long, the second longest tunnel in the World. It will be 3 miles shorter than that of St. Gothard under the Alps. Its completion will mark the culmination of a heroic struggle for the construction of a transcontinental route through Colorado, running from Denver to Salt Lake City. It will open the western slope of the Rocky Mountains to all-year traffic, connecting in the west with Moffat's original railroad below the snow blockage line.

With the utilization of the proposed Dotsero cut-off, a 41-mile branch railroad to be built from the west portal of the tunnel, the distance from Glenwood Springs, on the west slope, to Denver, will be reduced from 343 to 173 miles. The railroad in the tunnel will be electrified, electric locomotives hauling the trains. The steam locomotives will have their fires banked and will be hauled through with the trains. Tunnel construction work was started in October, 1923.



Governor Adams of Colorado Congratulates Mayor C. C. Nelson of Salt Lake City (Left) After Flood Blast in Moffat Tunnel

W&A World Photos

Extracts of Governors' Messages Continued

A digest of the Governors' addresses to the Legislatures was started in the *ELECTRIC RAILWAY JOURNAL*, issue of Feb. 26. Five more messages are now added. They are from the states of Rhode Island, Tennessee, Washington, Connecticut and Wisconsin.

RHODE ISLAND

Aram J. Pothier, Governor, stated in his message to the Legislature that of late years there had been an increasing tendency on the part of the state to control the matter of the issuance of the bonds and stock of public utility corporations from the outset by giving to the regulating commission the power to pass upon the issue of securities of such corporations and to scrutinize the arrangement under which these are paid for. The results to be expected from it are, in the end, a great simplification of the problem of regulation, as under it the outstanding securities will gradually come to be, at least *prima facie*, the measure of the real investment devoted to the public service upon which it may ultimately be conceded a proper return is due. The purchaser of such securities would be assured that proper application was made of the funds derived from the issuance and public confidence would be created in the integrity of such securities.

The exercise of such authority by the Public Utilities Commission would make necessary the employment of expert engineers and accountants in order that its duties might be properly performed. Inasmuch as such regulation would largely inure to the benefit of the utility and the holders of its securities, it would appear proper that any such extraordinary expenses involved in reference to a particular issuance of securities be charged to the particular utility concerned. He therefore recommended to the General Assembly the passage of suitable legislation vesting in the Public Utilities Commission the power to regulate all issues of bonds and stocks of all public utility corporations in the state.

He recommended an increase in the gasoline tax from 1 cent to 2 cents per gallon, to go into effect on July 1, 1928. The Motor Vehicle Department, during the past year, has made an earnest effort to reduce the terrible toll of highway accidents.

TENNESSEE

It is the plan of Gov. Austin Peay to continue during the next two years to build state highways. He opposed any increase in the gasoline tax, believing that 3 cents a gallon was enough tax to pay on gasoline. Further, because his state could build and complete its state system of highways on the present tax, it was generally a fine thing to maintain a lower tax. He referred to the report of the Commissioner of Highways and Public Works, which contained suggestions for the regulation of travel and traffic on the state highways. Parking automobiles on the traveled portions of these roads was causing many accidents resulting in loss of life and property.

On the subject of buses, he said that regulation had become necessary to safeguard the security and comfort of the public; that exclusive franchises to operate these bus lines would be sought. Such franchises, if granted, would be exceedingly valuable and could be sold for large sums. He believed that the state had a right to part of the receipts from all bus lines. He recommended that a commission be created and invested with proper authority to regulate schedules, fares and service on all buses and bus lines and such form of transportation, and to receive and collect a right percentage of all the receipts accruing from such use of the roads by these buses and bus lines, or in lieu thereof that an annual tax be levied and collected in keeping with the value of the franchises and rights that they are using, whether or not they be exclusive.

He recommended proper legislation on the distribution and price of gasoline. On the question of public utilities, he recommended the abolition of the Board of Public Utilities, which he claimed never functioned to the satisfaction of the people. He reiterated his thoughts on the subject which were expressed in opening the campaign for Governor a year ago.

He recommended the passage of a bill to simplify corporation laws so as to encourage the investment of foreign capital in the state, and to save the loss of fees and revenues which the state is now losing through the use of foreign charters to corporations whose business was largely domestic.

WASHINGTON

Gov. Roland H. Hartley reminded the state Legislature that he had previously expressed belief that the state was spending too much money for highways and had requested the reduction of motor vehicle license fees. He said he was still of the opinion that a smaller construction program could be carried on with better supervision, less cost and more satisfactory results to the general public.

CONNECTICUT

In Connecticut the problems of motor vehicle regulation become each year more numerous and pressing. Governor Trumbull, in his message to the General Assembly, urged upon the Legislature the creation of a joint standing committee on motor vehicles which should have exclusive charge of the consideration of all proposed legislation dealing with these topics. He said that it must be recognized that transportation problems and regulations of the various forms of vehicular traffic are becoming each year more vital to the economic stability of the industries and specific conditions of the inhabitants of the state.

WISCONSIN

Gov. Fred R. Zimmerman, in his message to the Wisconsin Legislature, has approved the segregation of the motor vehicle department, placed under a commissioner to be appointed by the Governor. He recommended that the property tax on all motor vehicles should be removed and an increased tax on gasoline should be substituted.

Free Rides in Spokane

Two business institutions of Spokane, Wash., have announced the policy of free car rides. For the second time in six months, Culbertson's, a department store, chartered all inbound cars of the Spokane United Railways for its semi-annual assistant buyers' sale, paying the company direct for all passengers carried between 9 and 10 a.m. on the day of the sale. Thousands of shoppers took advantage of the offer.

The second institution was the Clemmer Theater, which has announced it will pay the fare of any patron at its theater who presents a transfer at the ticket office dated the day it was taken to the theater and presented between 11 a.m. the opening hour, and 1 p.m.

Trolley Topics, published by the Spokane United Railways, says that the department store and other houses realize how necessary it is to have reliable and responsible transportation always at hand.

Old Richmond Franchise Relinquished

The Virginia Electric & Power Company, Richmond, Va., has formally surrendered all its old franchises and certified the agreement as to the surrender of its three toll viaducts within five years at the option of the city. The deeds of surrender were handed to City Clerk Alfred H. McDowell, who gave an official receipt for them. The form and style of execution of the documents were approved by the city attorney. When the city approved the so-called blanket traction franchise ordinance on Aug. 19, 1926, it was agreed that within six months the company would surrender the franchises whose privileges were included in the blanket agreement. The old franchises, all of which were operative until the blanket franchise was drawn to replace them, were acquired by the Richmond Passenger & Power Company, the Virginia Railway & Power Company and the Virginia Electric & Power Company as the local railway system in the city of Richmond developed.

Missouri Line Receives Franchise

A franchise for the construction and operation of an electric passenger and freight line with its Clay County terminus in Liberty, Mo., and its Jackson County terminus in Kansas City, Mo., has been recently granted by the Clay County Circuit Court. The right of way is said to be under option. This project was referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Feb. 26, page 393.

Articles of association have been granted by the Secretary of State to W. E. Winner and eleven business men and land owners of Liberty and its vicinity. Construction plans, according to Mr. Winner, call for a 150-ft. right-of-way in Clay County. The men associated with the project are planning a double track.

The road will run northeast to the Missouri River from the point contemplated, crossing on its own bridge

at a point approximately 3 miles south of Birmingham and a trifle to the west. Following the river east a short distance, the line would then branch off northeastward, passing just east of Birmingham. At a point approximately 3 miles from Liberty the plan contemplates a branch line east to the Atwood quarries.

\$314,000 Expenditure at Macon Suggested

Virtual rebuilding of the entire railway system of Macon, Ga., at an outlay of \$314,000 is proposed in an exhaustive survey made by F. L. Butler, copies of which have been received by Mayor Wallace Miller and members of Council of Macon. Mr. Butler is vice-president of the Georgia Railway & Power Company, which is included in the system of the Georgia Power Company, which also controls the Macon property.

In return for this expenditure, a very large one for a city of the size of Macon, the company wants the gross receipt tax of 2 per cent imposed by the city lifted, the pavement assessment levy imposed by the city lifted, and a cash fare of 10 cents with three metal tokens for 25 cents.

In addition to the main points set forth above a multitude of minor changes are proposed and the public utilities committee of Council awaits a report from the city electrical engineer, Charles H. Humphreys, before giving the proposal consideration. At least several weeks must elapse before the city will be ready to take up the matter with the company for discussion.

Bill Against Indiana Commission Killed

The Indiana Senate has killed the Cann bill, providing for the abolishment of the Indiana Public Service Commission. The vote was 30 to 17. Seventeen Senators entered the debate. Howard A. Cann, who introduced the measure, declared that the state administration defeated the bill. Many of the Senators who voted against the bill said in their arguments that any opposition to the present personnel of the commission or to its decisions was not a reason for abolishing the regulatory form of adjusting public utility relations with civic government.

Amendments to the Moorhead public utility bill in the Indiana Senate have been made as follows:

To bring holding companies, whether inside or outside the state, under the jurisdiction of the Public Service Commission.

To fix the value of utility property in all proceedings other than for rate-making purposes "as a going concern at the actual present fair value thereof," the idea being to exclude good will and other matters as part of the valuation.

To require utilities to exhaust every avenue of appeal through the state courts before taking an appeal from a decision of the commission to the federal court.

To make the commission on law conform with the Interstate Commerce Commission act as regards suspension of rates and reparations.

To provide for the appointment of members of the commission by the Governor. Members of the commission would be removable for cause by the Governor, or on verified petition filed by any taxpayer in the Circuit Court at Indianapolis, with right of appeal from that court to the State Supreme Court as in civil cases.

Developments in Los Angeles Fare Problems

In a message to the City Council on the railway situation Mayor George E. Cryer, Los Angeles, Cal., recommends the suggestion of the Municipal League that Delos F. Wilcox, traction expert, be brought to the city to advise on the railway problem now at the front with the application of the Los Angeles Railway for an increase in fares from 5 to 7 cents. The Mayor believes that Mr. Wilcox should be able to "assist us in the pending rate case," as well as to report upon other phases of the railway situation.

Meanwhile the application of the Pacific Electric Railway for fare increases on its urban and interurban lines operating in southern California is scheduled for hearing before the California Railroad Commission on March 10. The city of Los Angeles has already appropriated funds to oppose the rate raise.

Sinbad the Salesman in Bad

He couldn't get rid of it because there was no place to park and so the merchant got tired waiting for him and gave the order to another salesman. The latter was a wiser salesman because he had traveled from Baltimore



SINBAD the SALESMAN

It happened—as it often does—that a Baltimore salesman set out in his automobile for Washington, confident that he would sell a very large order to a certain merchant there. But when the salesman got to Washington he found himself like Sinbad, and his automobile like the Old Man of the Sea—he couldn't get rid of it, because there was no place to park it. And so the merchant got tired of waiting for him and gave the order to another salesman who had wisely used the W. B. & A. Round trip fare only \$2.37. Ten, twenty and fifty-trip tickets at lower rates.

Washington, Baltimore & Annapolis Elec. R.R.Co.

Express Traffic to Washington every 30 minutes on the hour and half hour



CONSPICUOUS EFFORT TO SELL SERVICE

to Washington on the Washington, Baltimore & Annapolis Electric Railroad. For him the round-trip fare was only \$2.37, while the round-trip fare for the other salesman was too costly to be computed. The inability of Sinbad to rid himself of his burden, namely his automobile, is illustrated effectively in *Printers' Ink* of Feb. 3, 1927. In newspaper advertising the Washington, Baltimore & Annapolis Electric Railroad is meeting the problem presented by the motorized sales force.

The accompanying reproduction shows another conspicuous effort in the electric railways' campaign to urge the use of the electric line for transportation to the office, for shopping and to insure prompt attendance at the theater.

News Notes

Paving Question on Grand Rapids Ballot.—The City Commission at Grand Rapids, Mich., has approved by unanimous vote the plan to place on the ballot at the primary election on March 7 the charter change which will allow the commission to eliminate the charge now assessed against the Grand Rapids Railway for paving between tracks.

Fares in Annexed Region Reduced.—The Lynchburg Traction & Light Company, Lynchburg, Va., has reduced car fares in the annexed territory to 5 cents. The company has charged 6 cents since March, 1922, and since annexation sought to prevent the city from cutting the extra cent out. This was done by application to the federal courts for an injunction, but the District Court and Circuit Court of Appeals held they had no jurisdiction.

P. R. T. Released from Air Mail Contract.—Cancellation of the air mail contract for the route between Philadelphia and Norfolk via Washington is announced by the Post Office Department, the Philadelphia Rapid Transit Air Service, the contractor, having requested a release. The service was operated primarily as a passenger carrying line during the Sesquicentennial Exposition and had been suspended for the winter.

Wage Conferences in Augusta.—Negotiations are in progress between the management and employees of the Augusta Railway & Electric Corporation, Augusta, Ga. It is said that though both parties are agreed upon the main questions at issue, the company is unwilling to accede to certain demands involving money concessions upon the alleged plea of financial inability to meet added obligations under present conditions. Under the existing contract failure to reach an amicable agreement calls for arbitration.

Route Numbers for New Jersey Cars.—Trolley cars of the Public Service Railway, Newark, N. J., operating in the Essex Division are to carry route numbers, in addition to other signs indicating destination. The Central line cars already have been so equipped, and other lines will follow. Public Service bus lines have carried route numbers for some time, routes being designated by even numbers. Trolleys will have odd numbers, and the bus and electric railway lines operating in the same territory will have, so far as possible, contiguous numbers.

Rehearing on Permit Transfer Denied.—The Public Service Commission on Feb. 17 denied the petition of the Schenectady Railway for a rehearing on the commission's order, dated Oct. 6 last, consenting to the transfer of the certificate for the operation of a bus line between Schenectady and Guilderland, N. Y., from John Coons to Bohl Brothers, on the ground that sufficient reason had not been advanced by the railway for a further hearing. Bohl Brothers Inc., operating under another certificate covering a line between

Albany and Altamont, commenced through travel between Albany and Schenectady after the certificate covering the Guilderland-Schenectady line had been transferred to them. Following this action by the commission, the Schenectady Railway alleged that Bohl Brothers were operating between Albany and Schenectady by way of Guilderland in competition with it.

Expect Increased Revenues Since "Ride a Day" Urged.—"A Ride a Day Will Make Them Pay" was the slogan of the Ride the Street Cars Week in Seattle, Wash., which extended from Feb. 20 to 27 and which was sponsored by the Seattle Municipal Street Railway. Practically every civic club in the city co-operated in an effort to help lift the burden of debt from the lines. The Owl Drug Company gave away car tokens to all customers with purchases of 50 cents or more. All of the daily newspapers, in editorials and front-page stories, extended aid in advertising the plan.

Higher Fare in Johnson City.—A 7-cent fare for Johnson City, Tenn., was announced recently by D. R. Shearer, vice-president and general manager of the Johnson City Traction Company, following approval of the new rate by the State Railroad and Public Utilities Commission. An appeal for aid was prompted by the continued decrease in traffic, the deterioration of the cars and need for repairs to the tracks. Mr. Shearer said that at the present time the indebtedness was about \$30,000. If the people would co-operate, he said he would put a plan in effect calling for a ten-minute schedule throughout the system and eventually would install buses to points of the city which are not now reached by the street cars. Any added income is to be diverted to improving the physical property.

Improvement Classes in Salt Lake City.—The Utah Light & Traction Company, Salt Lake City, Utah, has started night classes for supervisors, carhouse foremen and employees in general, by means of which they will be enabled to increase their knowledge of several subjects, including mathematics, mechanical drawing, English and spelling. Two nights each week are devoted to these classes. No charge is made. A large number has enrolled.

Higher Fare Approved.—The Citizens Railway, Clarksville, Tenn., has been authorized by the Tennessee Railroad and Public Utilities Commission to increase its cash fare by 2 cents. The new fare will be 7 cents with a 6-cent book rate and 3 cents for children. The old fare provided a 2½-cent fare for children. The railway system, with a trackage of only 3½ miles and at present operating only three cars is a semi-civic project, the stock being owned by citizens who fifteen years ago bought the system when operation was about to be discontinued by the private owners.

Express Service Discontinued.—The Jacksonville Traction Company, Jacksonville, Fla., has served notice of the discontinuance of its express service on the Brentwood line. The operation of the express cars has been carried on for the past two months as an experiment.

Recent Bus Developments

Bus Proposal Rejected

For Second Time Cincinnati Residents Vote Down Proposal to Replace Railway with Coaches

Two hundred and fifty citizens of Mount Lookout, a residential section of Cincinnati, Ohio, voted on Feb. 11 to refuse the offer of a four months trial of motor coach service to replace electric railway service. The proposal was made by Walter A. Draper, president of the Cincinnati Street Railway, after careful study of the transportation problem of that district and after many conferences with the special transportation committee of the Mount Lookout Business Men's Club.

The Cincinnati Street Railway is confronted with the necessity of reconstructing its tracks within a year or two on Delta Avenue, the route that serves Mount Lookout. Much had been said in conferences with the transportation committee about the feasibility of motor coach transportation, and it appeared that motor coach service might be more desirable to these people. The \$175,000 necessary for new tracks would then be practically a loss. Work on the new tracks could not be started at once and the old tracks were already in rather poor condition.

It was proposed with the motor coach service to give a through line to the main business district of Cincinnati in both directions, whereas the railway furnishes through service only to the north. A transfer to Eastern Avenue at Delta is necessary if one wishes to go downtown, south on Delta. The rate of fare would remain the same as regular motor coach fare in Cincinnati.

In presenting the proposal to the people Mr. Draper said in part:

In considering the suggestion I am especially desirous that it be understood that it is being made without any other motive than as outlined herein, and that is to give the people of Mount Lookout on Delta Avenue an opportunity to determine for themselves and by experience whether they prefer or can better be served by motor coaches or cars. Without trying motor coaches exclusively they cannot have the actual experience to be used as a basis for comparison. If they can best be served by motor coaches and prefer them after a trial, and if motor coaches are able to take the place of street cars in some communities, such as Mount Lookout, it would seem to me that it is desirable to find this out before expending the money and putting the new tracks in the street.

It should be clearly understood that the matter is to be left to the people and that the temporary discontinuance of street cars should in every way be safeguarded so as to require the restoration of street cars in case your people should so desire.

In conclusion I desire to say that this matter has been discussed with Edgar Dow Gilman, the Director of the Department of Public Utilities, and it is now being submitted to you with the approval of that department, the understanding being that the temporary operations proposed to be undertaken as a trial will be approved by the city if your people express themselves as desiring it to be done.

The real wishes of the people were expressed in the following motion:

It is the sense of this meeting that we do not favor a substitution of motor coaches for street cars on Delta Avenue, even for a trial, but desire the street car service to be continued.

This is the second time the Cincinnati Street Railway has had a proposal to substitute motor coaches for railway service rejected in a thickly populated section. The other case was similar to this, except that the street paving was being renewed and the tracks were torn out. In that instance the company offered to substitute motor coach service for railway at once, or to have the center of the street left open and the sides paved while a trial of motor coach service took place. Both phases of the offer were rejected by the people in that district.

Connecticut Commission Reversed in Bus Case

Judge Newell Jennings of the Superior Court, sitting at Hartford, Conn., recently rendered a decision setting aside and declaring void an order of the Public Utilities Commission which granted to the New England Transportation Company a certificate to operate a bus line between Waterbury and Hartford via Milldale, Southington, Farmington and West Hartford.

In its original application the New England Transportation Company, which is a subsidiary of the New York, New Haven & Hartford Railroad, requested the Public Utilities Commission for a certificate to operate a bus between Danbury and Hartford via Waterbury. This it did despite the fact that the Waterbury & Milldale Tramway operates an electric railway between Waterbury and Milldale, a third of the distance between Waterbury and Hartford, and operates a bus line in conjunction with its railway between Waterbury and Milldale for some period of time. It applied to the commission for an extension of its bus certificate from Milldale to Hartford via Southington, Plainville, Farmington and West Hartford. The railway produced evidence to show that public convenience and necessity demanded the operation of a bus over the route which was proposed by it.

After the evidence had been closed, the Transportation company amended its route so that it paralleled that of the tramway. Notwithstanding the fact that the tramway had produced the evidence, the commission passed an order granting the certificate to the Transportation company. From this order the tramway appealed to the Superior Court and was successful when Judge Jennings recently decided that the commission erred in granting the certificate.

The decision in this case is of particular interest because a ruling of the commission has not been reversed by the Superior Court for some time. The appeal of the tramway acts as a stay, so that the Transportation company has been unable to operate between the terminals of the route.

The Transportation company has now appealed to the Supreme Court of Errors of Connecticut.

Worcester Consolidated Company Buys Lake Bus Lines

The Worcester Consolidated Street Railway, Worcester, Mass., has bought the Lake Bus Lines. Included in the transaction are seven buses, a large leased garage with a repair shop and the good will of the Lake Bus Lines, Inc. It is the first strictly "city" bus line bought by the railway and in a measure supplements the only other local bus lines operated by it.

When the Massachusetts Omnibus Company of Boston sent a fleet of eighteen buses to Worcester Mr. Carter, from whom the Worcester Consolidated Street Railway bought the Lake line, was in the trucking business. The bus company was forced out of business. Mr. Carter bought four of the buses for \$1,600. He used them for a time to carry private parties, but finally established the Lake lines at the urgent plea of Lake district residents in Worcester. The Consolidated, in addition to its local routes, now operates buses to Marlboro, Clinton, Oakdale and Southbridge.

Bus Capacity Tax in Dallas Questioned

A test of a city's right in Texas to levy and collect from street car systems operating buses for carrying passengers the same per passenger capacity tax levied on other buses used as common carriers is to be made in Dallas, Tex. A temporary injunction was granted recently restraining John H. Cullum, county tax collector, from levying and collecting the \$4 per passenger capacity tax, in addition to the regular registration fee, on seven of 21 buses operated by the Dallas Railway & Terminal Company. This company operates the railway lines in Dallas and runs 21 passenger buses as feeders. The petition of the railway sets forth that Tax Collector Cullum was tendered the regular registration fee for these trucks operated as passenger-carrying buses, but that he refused to accept such fee without the additional \$4 per passenger capacity fee. The plaintiff also is asking that a writ of mandamus be issued directing Mr. Cullum to accept the registration fee and issue a license for authority to operate during 1927.

Holyoke Litigation Ends

The Holyoke Street Railway, Holyoke, Mass., has won a final and decisive victory over the appeal of the Interstate Buses Corporation, Hartford, Conn., for a rehearing of the case. The latter company has received notification from the United States Supreme Court that petition for a revival of the case has been finally denied. The final denial of the courts to hear an appeal will prevent the Interstate Buses Corporation from taking passengers between Springfield and Greenfield without the necessary licenses, which the company has been unable to secure.

The lines of the Holyoke Street Railway and Interstate Buses Corporation run parallel for a great distance between Springfield and Greenfield, Mass. The former company alleged illegal competition and sought to prevent the

bus company from picking up passengers over any of this distance without first procuring licenses from the towns passed through.

The railway alleged that the bus company was acting in violation of a Massachusetts statute, while the Interstate company said the statute was unconstitutional. The trial a year ago was based on this argument and the result upheld the state of Massachusetts and its bus laws. The Interstate in its fight attempted to have an injunction issued to prevent officials from prosecuting bus drivers of the company. It succeeded in securing a temporary injunction in the state courts. Three judges of the United States District Court later ordered the bill dismissed. On an appeal the Supreme Court upheld the District Court.

Petition on Framingham Bus Substitution Heard

The petition of Franklin T. Miller, receiver of the Boston & Worcester Street Railway, Framingham, Mass., in which he seeks to gain permission to supplant bus service for electric railway service over parts of the lines, was heard recently before Judge Carroll of the Supreme Court.

Roland W. Boyden, representing the bondholders, said that any discontinuance of electric railway service would injure the good will at a sale of the property if a reorganization is effected. Mr. Boyden brought out that plans for reorganization were temporarily held up awaiting the action of the Public Utilities Commission regarding the valuation of property. Just recently the commission decided that the property had a valuation of \$2,900,000. There is a bond issue of \$2,500,000.

Mr. Boyden's request for a postponement for a month to permit plans to be made for a reorganization was granted.

New Line Authorized.—The Public Service Commission granted on Jan. 18 the petition of the Utica Railway Co-ordinated Bus Lines, Inc., for a certificate for the operation of another bus line within the city of Utica, N. Y. The line is about 3 miles long.

Certificate Granted.—The Public Service Commission on Feb. 25 granted the petition of the Rochester Railways Co-ordinated Bus Lines, Inc., for a certificate for the operation of bus lines from the city of Rochester to Manitou Beach, Grandview Beach, Island Cottage and West Greece, N. Y.

Bus Line Approved.—The Public Service Commission granted the petition of the Olean, Bradford & Salamanca Bus Line, Inc., for permission to operate a bus line between Olean and Salamanca and between Olean and the New York and Pennsylvania state line on the road to Bradford, Pa. This company is a subsidiary of the Olean, Bradford & Salamanca Railway, which is now in receivership, and which desires to replace cars with buses.

Bus Petition Granted.—The Public Service Commission on Feb. 25 approved the petition of the County Transportation Company, Inc., for a certificate calling for the operation of bus lines in Port Chester and Rye.

Trolley service has heretofore been given in this territory by the New York & Stamford Railway, which discontinued its lines in December, 1926. The bus company is a subsidiary of the railway. The routes authorized by the commission are more extensive than the electric railway lines.

Abandonment of Unprofitable Service Favored.—A resolution was adopted recently favoring the proposal of the Wisconsin Public Service Corporation to abandon its unprofitable railway service in Two Rivers, Wis., and interurban service between Manitowoc and Two Rivers. The discontinuance was favored on condition that adequate bus service be installed under some plan agreeable to both cities.

Allowed to Run Bus Line.—The Public Utilities Commission has granted permission to the Connecticut Company to operate a bus line between Newington Junction and Hartford via West Hartford, Quaker Lane and Capitol Avenue. The company is planning to start operations over the new line about April 1. The service to be maintained will be decided upon after a trial period. The rate of fare between Newington and Hartford will be 20 cents or two tokens with the privilege of transfer. At the start an hourly headway will be arranged. It is planned to add a bus during the rush periods as the business grows.

Rush-Hour Service in Effect.—The bus service installed on Washington's Birthday by the Twin City Motor Bus Company to supplement railway service into Bryn Mawr of the Minneapolis Street Railway, under a recent permit of the Minneapolis, Minn., Park Board and the State Railroad and Warehouse Commission, operates only in rush hours. The service is every twelve minutes between 7 and 9:30 a.m. and 5:18 and 8 p.m. It is accommodating workers and school children in a newly settled community beyond Bryn Mawr and the center of Minneapolis. The settlement is not sufficient to warrant continuous service. The bus line is the first operated by the Twin City Motor Bus Company over parkways in Minneapolis and the fourth opened for the railway within the city limits since last fall. The regular fare prevails with transfer privileges.

Substitution by Bus Approved.—The Public Service Commission on Feb. 25 granted the petition of the Westchester Street Transportation Company, Inc., for authority to substitute bus service for street cars on a portion of its route in Scarsdale, N. Y., and authorized the putting into effect of its tariff of rates on one day's notice. This company is a subsidiary of the Third Avenue Railway. On Dec. 9, 1926, the commission authorized the substitution of buses for street cars in White Plains with the approval of the city authorities. On Jan. 26, 1927, the village of Scarsdale approved the substitution of buses for street cars, which the commission approves in this order. The company proposes to operate its lines in White Plains and Scarsdale in one continuous route. The rate of fare authorized within the city of White Plains or in the village of Scarsdale is 10 cents and from Scarsdale to White Plains or return 15 cents.

Financial and Corporate

Georgia Consolidation Concluded

Consolidation of six Georgia public utility companies into the Georgia Power Company has been completed with the issuance of a charter to the new company by Secretary of State S. Guyt McLendon. The new company begins operation at once.

Simultaneously with the granting of the charter the Georgia Power Company acquires title to and control of properties formerly operated by the Athens Railway & Electric Company, Georgia Railway & Electric Company, Georgia Railway & Power Company, East Georgia Power Company, Rome Railway & Light Company and the constituent Georgia Power Company, the last named including properties formerly belonging to the Athens Gas Light & Fuel Company, Georgia Southern Power Company, Georgia Utilities Company and Milledgeville Lighting Company.

In addition to the above companies subsidiaries of the new company include the Central Georgia Power Company, Macon Railway & Light Company and Macon Gas Company, serving the Macon district; the Mutual Light & Water Company, operating in Brunswick, and a number of others.

Officers of the new company, as designated in the charter, are: H. M. Atkinson, chairman of the board; P. S. Arkwright, president; G. W. Brine, Charles C. Adsit, F. L. Butler and F. P. Cummings, vice-presidents; W. H. Wright, secretary; I. S. Mitchell, Jr., treasurer; F. R. Mitchell, assistant treasurer; B. T. Simpson, assistant secretary, and Stephen A. Dawley, assistant secretary. With the exception of Mr. Cummings and Mr. Dawley, who reside in New York, all of the officers are of Atlanta.

Merger of the companies brings to an end, so far as names are concerned, some of the oldest utility companies in Georgia. At the same time it increases their scope of service in the new company. One of the oldest of the companies is the Georgia Railway & Electric Company, which came into existence in 1902. While this company continued to exist until the present, all of its properties were leased to the Georgia Railway & Power Company, organized in October, 1911.

The organization of the latter company was the first real step in the development of Georgia's vast water power resources, as it immediately undertook the development of the Tallulah, Tugalo and Chattooga Rivers in North Georgia, and this year will complete the last of a chain of six water power plants on these rivers, which have a total capacity of 284,500 hp. of electrical energy.

In addition to serving Atlanta with electricity, gas, steam heat and transportation, the Georgia Railway & Power Company has rendered service to many other towns and cities in the state. It was the largest of the companies involved in the consolidation and also the largest in the state.

The Athens Railway & Electric Company came into existence in 1910, and besides furnishing Athens with electricity, gas and transportation service, it also developed three water-power sites adjacent to Athens.

The Rome Railway & Light Company was chartered in 1906 and furnished electric light and transportation service to Rome.

The Georgia Southern Power Company, which served Dublin and surrounding territory, was organized in 1925. The Milledgeville Lighting Company was chartered in 1924.

St. Louis Sale Recommended

Special Master Williams in a report to the federal court on Feb. 24 recommended foreclosure sale of the properties of the United Railways, St. Louis, Mo., under a \$9,790,000 issue of St. Louis Transit Company bonds in default since last October.

In this connection it has been indicated that United States District Judge Faris about March 20 will fix a date for the sale of the properties under foreclosure, as recommended by Mr. Williams. The court is also expected to fix the minimum or "upset" price at which the properties may be purchased. The foreclosure sale would quickly terminate the receivership, which began in April, 1919.

The recommendations of the special master was based on hearings for foreclosure under the mortgages securing the \$9,790,000 St. Louis Transit Company 5s, the \$4,500,000 St. Louis & Suburban general bonds and \$3,000,000 of St. Louis & Meramec River Railway bonds. Interest on the Transit and the Suburban bonds has been in default since Oct. 1, 1926, and on the Meramec River bonds since Nov. 6, 1913. The bonds of the latter are held merely as collateral security for the Suburban generals. The Suburban general bonds cover that part of the car system taken over when the properties of the St. Louis & Suburban Railway were purchased by the St. Louis Transit Company.

The St. Louis Public Service Company has already been formed to acquire the United Railways properties at foreclosure sale. This company has been negotiating with city officials for a new franchise under the service-at-cost system, but no agreement has been reached on the rate of return to be allowed the company, nor on some tax questions, referred to elsewhere in this issue.

Financing of Porto Rico Railways Purchase Arranged

For the purpose of acquiring the Porto Rico Railways, Ltd., Ponce, P. R., and for extending and improving controlled properties, offering is made of \$3,000,000 of 6½ per cent 30-year gold debentures of the International Power Company, Ltd., a public utility hold-

ing and operating company, which controls properties in Bolivia, British Guiana, Newfoundland, Porto Rico, Salvador and Venezuela. The debentures are offered by Royal Securities Corporation, Ltd., and G. E. Barrett & Company at 100 and interest yielding 6½ per cent and mature March 1, 1957. They are redeemable on 30 days notice at 105 and interest, payable at the rate of \$4.86½ to £1.

Purchase in Norfolk Arranged

The stockholders of the Virginia Electric & Power Company, Richmond, Va., a subsidiary of the Engineers Public Service Company, have voted favorably on the proposition to acquire the Norfolk Railway & Light Company, which is now operated by the Virginia Electric & Power Company under a 99-year lease entered into June, 1906. The Virginia Electric Company will acquire the capital stock of the Norfolk company on a basis of \$33 a share in cash or one share 6 per cent cumulative preferred stock and \$9 cash for each three shares of the latter. The Virginia company already owns 62,400 shares of the 66,000 shares outstanding of the Norfolk company.

Seattle Tax Decision Stands

The decision of the lower courts that the city of Seattle, Wash., must pay the Puget Sound Power & Light Company \$545,370 to reimburse the company for taxes paid on the railway lines sold by the company to the city in 1919, together with interest, will stand. The United States Supreme Court on Feb. 28 refused to grant a writ of certiorari to review the case. Each side had appealed, the company from a decision by the Court of Circuit Appeals, which modified the decree of the District Court so as to provide payment from a special fund, and the city from the entire order. In a decision some months ago the Supreme Court held in a related case that the contract by which the company sold the street railway to the city was binding upon the city to pay the taxes for the year in which the sale was made.

Local Company Not Interested in Washington Interurban

The Washington Railway & Electric Company, Washington, D. C., has rejected a proposal that it take over and operate the Washington-Virginia Railway, now in the hands of receivers. The proposition which the Washington company was considering did not involve outright purchase of the holdings of the Washington-Virginia line, but called for a plan of joint control with certain Virginia interests, it was learned. Recently an announcement was made by the receivers that the holdings of the interurban would be sold at public auction.

The company operates electric cars from Twelfth Street and Pennsylvania Avenue over one double-track line to Arlington Junction, Va., where separate lines diverge to Alexandria and Mount Vernon and to Clarendon, Falls Church and Fairfax. The railroad also operates a bus line over the Lee Highway to Fairfax.

Twin City Expands

Net Income in Minneapolis and St. Paul in 1926 Shows Gain—Taxicab Control

The total operating revenue of the Twin City Rapid Transit Company and its subsidiary companies of Minneapolis and St. Paul, Minn., for the year ended Dec. 31, 1926, was \$13,945,266, an increase of \$1,566,914 as compared with the year previous. Total operating expenses were \$10,322,488, compared with \$9,234,088 for 1925. These facts were included in the annual statement of Horace Lowry, president of the company, to the stockholders.

CONSOLIDATED INCOME STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY*

	1926	1925
Revenue from transportation.....	\$13,825,851	\$12,269,156
Revenue from other operations.....	119,415	109,196
Total operating revenue..	\$13,945,266	\$12,378,352
Way and structures.....	\$1,201,892	\$1,215,796
Equipment.....	1,106,303	1,129,065
Power.....	1,198,256	1,270,698
Conducting transportation..	4,475,622	4,391,692
Traffic.....	46,492	36,233
General and miscellaneous..	1,217,687	1,248,919
Transportation for investment—Credit.....	39,544	58,317
Motor bus expense.....	1,115,778	.....
Total operating expenses.	\$10,322,488	\$9,234,088
Net operating revenue....	\$3,622,778	\$3,144,263
Taxes assignable to operation.....	1,229,115	1,291,137
Operating income.....	\$2,393,662	\$1,853,125
Income from unfunded securities and accounts.....	\$50,199	\$73,045
Miscellaneous income.....	6,298	49,666
Net income miscellaneous physical property.....	.....	61,918
Total non-operating income	\$56,498	\$184,631
Gross income.....	\$2,450,161	\$2,037,757
Rent for leased roads.....	\$3,000	\$3,000
Interest on funded debt.....	995,520	988,954
Interest on unfunded debt.....	5,887	.....
Miscellaneous debits.....	7,311	\$,375
Net loss miscellaneous physical property.....	1,636	.....
Total deductions from gross income.....	\$1,013,355	\$1,000,329
Net income transferred to profit and loss.....	\$1,436,805	\$1,037,427

*The income statement for 1926 includes the operations of the Twin City Motor Bus Company.

The net earnings of the company's buses for the year 1926 were small because complete control and operation of all the bus lines operating between the cities of Minneapolis and St. Paul and local lines was not acquired until during the early part of 1926 and it required some months to obtain the authority necessary to consolidate operations on an efficient basis. The report stated that the management was satisfied that the operation of the bus properties would earn a much larger return during 1927.

During the latter part of 1926 a prominent Minneapolis investment house secured control of practically all of the taxicab companies operating in Minneapolis and St. Paul, as well as some outside points in the state, and was about to make an offering of the stock of the consolidated taxicab company. The railway management recognized that if this stock became scattered at the time it would be im-

possible for the company to enter that field of transportation in the future and for that reason, on Jan. 4, 1927, acquired a controlling interest in the taxicab combination. Mr. Lowry said that in view of the constantly increasing use of the motor-driven vehicle it seemed imperative that the Twin City Rapid Transit Company should engage, as far as possible, in all forms of public transportation, and inasmuch as it was already operating the local and intercity bus lines, it was only logical that the operation of the taxicab business should also be taken over.

The unification of the various competing cab companies will increase materially public transportation by the elimination of congestion, according to the management, which is satisfied that the Twin City Rapid Transit Company will be paid a fair return on its investment which has been made by it in the taxicab business.

During 1926 the company earned sufficient to pay regular quarterly dividends at the rate of 7 per cent per annum on its preferred stock and paid four quarterly dividends of 1½ per cent on the common stock, which is 1 per cent more for the year than was paid during 1925.

Mr. Lowry referred to the previous report, which called attention to the provision in the commission's order fixing the rate of fare in the city of St. Paul. He referred to the general election in November on the city charter amendments for St. Paul and their non-passage by the voters, because of the fact, he said, that any voter not voting on the question at a general election had the effect of counting as a vote against the measure. He said that the management was now urging the St. Paul City Council to call a special election at which the city charter amendments only would be submitted. If the city did not take this action the company would be forced to seek other relief.

PROFIT AND LOSS ACCOUNTS OF THE TWIN CITY RAPID TRANSIT COMPANY*

Balance Jan. 1, 1926.....	\$1,866,347	
Additions for the year.....	1,436,805	
Net adjustments.....	\$30,247	
Dividends on preferred stock..	210,000	
Dividends on common stock....	1,100,000	
Balance carried forward.....	1,962,905	
	\$3,303,152	\$3,303,152

*The consolidated statements this year include the accounts of the Twin City Motor Bus Company.

CONSOLIDATED STATISTICAL REPORT OF THE TWIN CITY RAPID TRANSIT COMPANY

	1926	1925
Total revenue.....	\$14,001,764	\$12,562,983
Total operating expense....	\$10,322,488	\$9,234,088
Net revenue.....	\$3,679,276	\$3,328,895
Revenue passengers carried..	190,826,784	200,783,106
Transfers redeemed.....	69,248,145	72,814,559
Operating, per cent of revenue, taxes included.....	82.50	83.78

STATISTICAL STATEMENT OF THE TWIN CITY RAPID TRANSIT COMPANY

Track-miles, all track reduced to single track.....	504.53
Total car-miles operated.....	29,297,108
Gross passenger car revenue....	\$12,603,215.75
Revenue passengers carried.....	185,711,950
Transfer passengers carried.....	68,917,932
Revenue passengers per car-mile.....	6.34
Total passengers per car-mile.....	8.69

Stark Electric After Canton Lines

Negotiations for control of the city railway lines at Canton, Ohio, have been opened by officials of the Stark Electric Railroad, Alliance, Ohio, with offices of the Northern Ohio Power Company, which operates the Canton lines. The franchise of the Northern Ohio Power is about to expire. Launching plans for new operating rights that company asked the Council at Canton for an exclusive grant.

If this deal is consummated the Stark Electric will double its mileage. At present the company owns 30 miles of interurban track from Canton to Salem. The Canton system consists of 30 miles of track.

There have been several conferences between officials of the two companies, but no definite action has yet been taken. The outcome, according to E. W. Sweezy, general manager of the Alliance company, depends on the degree to which the Canton City Council cooperates with the Stark Electric in the proposal. Action in taking over the Canton city lines will not affect present interurban service to Canton and other near-by cities by the Northern Ohio Power Company. That company will continue to operate the intercity lines, surrendering only the city routes to the Stark.

Seattle & Rainier Property Tax Discussed

A resolution urging the City Council of Seattle, Wash., to enforce collection of a delinquent franchise tax owed by the Seattle & Rainier Valley Railway has been shelved by the Council utilities committee. The resolution, submitted by the Commonwealth Club, which is fighting the proposed purchase of the valley line by the city, states that over a period of years the railway is now in arrears approximately \$75,000 in taxes. It was pointed out that the City Council, in closing the contract, to be voted on March 8, allowed in the price for the tax.

A new plan for collection by the city of the tax due has been proposed by Councilman Oliver T. Erickson and has been drafted in an ordinance by T. J. L. Kennedy for presentation to the City Council. Under present arrangements, the line exacts a 10-cent cash fare from patrons desiring a transfer to the municipal car lines. Of this 10 cents, half goes to the Seattle Municipal Railway and half to the company. Mr. Erickson proposes that the Rainier line reduce its fare, with privilege of transfer to the city-owned line, to 8½ cents, with the understanding that the city will credit the system with 1½ cents on each transfer accepted from the company's line, the amounts so credited to apply on franchise debt owed the city.

Wichita Property Reported Sold

Reports have it that the railway and bus lines run by the Wichita Railroad & Light Company, operating in Wichita, Kan., are to be taken over early in March by the Wichita Transportation Company. The latter corporation, it is said, is headed by Howard V. Wheeler, Robert B. Campbell and R. C. Clevenger, local capitalists.

Three Miles of Line Sold.—The board of directors of the Fort Loramie Railway, Fort Loramie, Ohio, and officers of the Western Ohio Traction Company recently completed the sale of 3 miles of railway line to the Western Ohio Traction Company of Lima. The latter company is now in possession of the holdings. The line was built in 1911 by the citizens of the section from Fort Loramie to Minister.

More Passengers Carried.—During the fiscal year ended Jan. 31, 1927, the Chicago Surface Lines, Chicago, Ill., carried 1,574,969,802 passengers, against 1,518,510,661 in the previous fiscal year, or an increase of 56,459,141 rides. Traffic handling facilities during 1926 were increased with the addition of 100 new cars and more than 99 per cent of the 3,639 cars now owned by the system are in service. October, 1926, marked the month of largest traffic for the system, when 135,878,579 passengers were carried. This exceeds by 2,929,063 rides the previous high monthly record made in December, 1925.

Rental Payment Declared on Manhattan Stock.—The regular quarterly dividend rental of \$1.25 a share on stock of the Manhattan Railway is announced subject to the plan of readjustment by directors of the Interborough Rapid Transit Company, New York, which controls the former by lease.

Equipment Being Scrapped.—Scraping of local railway and interurban equipment of the Ohio Service Company, Coshocton, has been started in Cambridge, Ohio. The work is being done by the E. P. Gaynor Company of Wheeling, W. Va. The company suspended its railway service between Cambridge and Pleasant City on Feb. 1. Bus service has been started in Cambridge and to points south, which had been served by the interurban line.

B.-M. T. Bond Rise in Effect.—The increased price for 6 per cent bonds of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., on sale by the War Finance Corporation went into effect on Feb. 15. Of an original offering of \$18,199,200, the corporation has \$10,262,000 unsold, the same total as on Feb. 3, when the increase in price was announced. The bonds are now offered at par and accrued interest against the price of 99½ and interest asked when the securities were first put on sale.

New Financing Arranged.—Day & Zimmermann, Inc., announce that the Southern Ohio Public Service Company, Zanesville, Ohio, has completed arrangements with Harrison, Smith & Company and Howes, Snow & Bertles, Inc., for new financing. Within the next few days, \$2,100,000 first mortgage bonds will be offered, from the proceeds of which the company will pay off \$690,750 first and refunding mortgage 6 per cent bonds of Southern Ohio Public Service Company. These will be called and redeemed on or about April 15, at 105, with accrued interest. The company is also paying off at par March 1 \$1,000,000 Zanesville Railway Light & Power Company 6 per cent bonds. The Southern Ohio Public Service Company is the successor to the Columbus, Newark & Zanesville Electric Railway.

Legal Notes

ALABAMA—*Highest Degree of Care Must Surround Passengers.*

In a suit by a passenger who was thrown from the steps of a trolley car, as she was alighting therefrom, to the pavement, which was muddy and rough and which had been torn up by the defendant, in preparation of its resurfacing, the court charged that the duty of the railway was to exercise the highest degree of care and provide reasonably safe and convenient places for their passengers to ride, and see that no danger befalls them in and about the duty of their agents in carrying passengers on their cars. [Birmingham Elec. Co. vs. Sheppard, 110 Southern, 604.]

CALIFORNIA—*The Automobile Driver Is Not Without Responsibility.*

Plaintiff who was injured was a passenger in an auto, driven by her son, which was struck by a trolley car as it crossed the tracks. There was proof that the auto had been proceeding at a speed from 20 to 40 miles an hour; that the approach to the tracks was somewhat obstructed, but that the car could be seen at a distance more than 200 ft. west of the crossing; that the car bell was rung for a considerable distance from the crossing, and when about 50 to 60 ft. from the crossing the operator saw the auto for the first time about 6 to 8 ft. from the tracks. It was held that the last clear chance doctrine was only applicable to a defendant who actually perceived danger of plaintiff in time to avoid the accident by exercise of due diligence and it could not be held liable on the theory that it should have discovered the peril. [Chappel vs. San Diego & A. Ry., 251 Pac., 321.]

KENTUCKY—*Window Sash Falling on Passenger's Arm Not Necessarily Due to Company Negligence.*

Appellant's elbow had been resting on the window sash and the window fell, injuring his elbow. The contention was that the sash which fell was under the exclusive control of the carrier, and since window sashes, if in good order and properly fastened, do not fall, there arose a presumption of negligence. The proofs failed in this respect. The court took notice that window sashes are often raised and lowered by passengers acting independently and therefore the doctrine of *res ipsa loquitur* does not apply. [York vs. Cincinnati N. O. & T. P. Ry., 288 S.W., 750.]

MISSOURI—*Humanitarian Doctrine Held Inapplicable to Pedestrian Hit by Rear of Car.*

A person standing too near the track when a car rounded a curve was struck by the rear end. The motorman could not know the pedestrian would not step back to avoid the end of the car, especially as he had to look forward to avoid traffic. To recover under the humanitarian doctrine, the plaintiff must be seen in a position of imminent danger immediately impending, actually or constructively known to the defendant, and he must then fail to exer-

cise ordinary care (proportionate to the calls of that danger), to avoid injury to the plaintiff. [Siegel vs. Wells, 287 Southwest. Rep., 775.]

MISSOURI—*Boy Climbing Tree Injured by Charged Guy Wire.*

A boy 13 years old, climbing a shade tree in a parkway, came into contact with a guy wire, originally installed by a telephone company, against which two sagging live wires of a power company had come in contact. The power company was held responsible. [Shannon vs. Kansas City L. & P. Co., 287 Southwest. Rep., 1031.]

NEW JERSEY—*Bus Drivers Must Not Turn Without Warning.*

A driver of a bus suddenly and without warning slowed down and turned to the left, crossing the entire width of the road. Plaintiff, who was following the bus in his auto, was forced off the road into a ditch, damaging his auto and injuring passengers. The court held that the jury was justified in finding negligence on the part of the bus driver. [Winter vs. No. Jersey Bus Co., 135 Atl., 473.]

NEW YORK—*Sale of Bus Franchises in Cities of the Second Class.*

A statute requires franchises in cities of the second class to be sold at public auction to the highest bidder and provides regulations as to the giving of security, etc. The city of Yonkers offered certain bus franchises for sale, but reserved the right to reject any and all bids if not reasonably satisfied as to "the good faith, responsibility and legal capacity of the bidder or bidders." This clause was held not in accordance with the statute and tending to discourage bidders, hence would make the sale illegal. The ordinance also required the bidder to accept only a portion of a route if any such portion was considered a public convenience and necessity by the Public Service Commission. This also was considered illegal by the courts as it required the bidder to accept a franchise he did not bid for and which the common council did not sell. The proper course would be that if the route approved by the commission was materially different from that sold, the bidder should not be compelled or permitted to accept it. A provision in the ordinance requiring the bidder to connect with stations on a subway were held valid as they did not make the franchise indefinite and uncertain. [Yonkers R. vs. City of Yonkers, 218 New York Supp., 103.]

NEW YORK—*State Controls Rapid Transit in Cities Unless It Has Divested Itself of that Power.*

An attempt was made to hold a city referendum by which the electorate of New York City might instruct the Board of Estimate as to its duty on rapid transit policies. On the plea of a citizen and elector, the City Board of Elections was required to omit from the ballot all reference to this matter. The State Court of Appeals held that the plan proposed was an attempt to

supersede the State legislature and to take from the Board of Estimate certain powers and duties which had been conferred on it by state legislation. The plan also proposed to take away powers which the state had confided to the Public Service Commission. In the matter of rapid transit regulation, the cities of the state have not been fully emancipated from the power of the legislature. For these and other reasons given in its decision, a mandamus was granted. [McCabe vs. Vorhis et al., 153 Northeast. Rep., 849.]

NEW YORK—Autoist Thought He Saw Red When That Was Impossible.

A verdict was recovered as a result of a collision of a car and auto. One witness testified that as the car passed him it had a red headlight on it. All other proofs submitted were that the car was in proper operating condition; that a red headlight could only be shown as a headlight when the operator turned the so-called reverse lever in neutral position, in which case power could not be so transmitted to propel the car in either direction. The verdict was set aside, as against the weight of the evidence. [Baldwin vs. International Ry., 218 N. Y. Supp., 599.]

OHIO—Attempt by Bus Operators to Preserve Individual Identity but Operate as a Unit.

The Public Utilities Commission had issued certificates for the operation of buses to certain individuals along a state highway, in competition to the service furnished by the petitioner. An application was made by the petitioner to revoke the certificates on the ground that the holders thereof were operating as a partnership under the name of Red Star Transportation Company and that they had obtained the certificates of convenience and necessity by representing themselves to be engaged in operating as individuals when they were in fact a partnership and that they had renounced their certificates by operating as a partnership. The proof showed that the individuals had employed a common manager, had a joint schedule, shared certain expenses and purchased certain equipment from common funds. It was held that unless the evidence also shows that such operators so taking the profits shared them not only as principals in a joint business, but that each had an express or implied authority to bind the other as principal and agent, the relief played for will not be granted. [So. Ohio P. S. Co. vs. P. U. Commission of Ohio, 154 N. E., 365.]

WASHINGTON — Certificate Properly Withheld from Bus Company, Even Though Promising Through Service.

The Department of Public Works properly denied the application for a certificate for operation of through bus service between two towns where existing bus service required two transfers. However, in each of these two cases the transfers were made in the same bus station, through tickets were sold and no complaint had been filed that this service was inadequate or insufficient for the public need. [State vs. Department of Public Works et al., 250 Pacific Rep., 1088.]

Personal Items

Del A. Smith General Manager at Detroit

Official Who Has Been Acting Manager of Municipal Railway Is Named to Succeed H. U. Wallace

Del A. Smith has been named general manager of the Detroit Department of Street Railways, Detroit, Mich., by the Street Railway Commission. He was made assistant general manager of the municipal system on Dec. 15, last, and became acting general manager on Jan. 1, when the resignation of Col. H. U. Wallace, former general manager, became effective.

During the absences of Col. Wallace last year, Mr. Smith had active charge of the municipal system and demonstrated his ability and his knowledge of street railway operations. His former appointment as assistant general manager filled a vacancy in that

ent, Nov. 9, 1926, which position he held until he was made assistant general manager.

Mr. Smith's appointment as general manager was made by Street Railway Commissioners John J. Barlum and H. H. Esselstyn. The third member of the commission, G. Ogden Ellis, is making a world tour, but it was announced that Mr. Smith's appointment had his full approval. The salary of the new general manager is \$12,000 a year.

Following the appointment several improvements and extensions of the municipal lines suggested by Mr. Smith were approved by the commissioners. The estimated cost of the extensions totals \$280,000 and work will start as soon as weather permits. All the improvements and extensions are to be financed out of the revenues received from the lines. It was also announced by Mr. Smith that the Detroit Municipal Railway has begun the rehabilitation of about 1,000 cars, the work being done in the Highland Park shops. It is planned to continue this work at the rate of about 100 cars a month.

Mr. Smith's appointment has been very highly approved by his associates and other employees of the municipal system, whose interests he has at heart and whose problems he understands by virtue of his past practical experience. His selection was also pleasing to city officials in departments with which he has come in contact and co-operated during his long service with the street railway.



D. A. Smith

Other Changes in Stone & Webster Personnel

In furtherance of recent changes in the personnel of the Stone & Webster management announcement has been made of the following assignments:

George H. Clifford, formerly district manager of the companies located in the southwestern district, has been appointed division manager in charge of companies located in the southwestern district, the Virginia Electric & Power Company and subsidiaries and the northern district properties of Eastern Texas Electric Company (Delaware corporation). Mr. Clifford's headquarters will be in the Boston office beginning April 1.

Walter H. Burke, formerly manager of the Northern Texas Traction Company and Tarrant County Traction Company, has been appointed district manager of the companies in the southwestern district, comprising the properties located in Texas, Louisiana, New Mexico and Mexico. After March 15 Mr. Burke will be located at Houston, Texas.

Alfred F. Townsend, formerly manager of the Florida Motor Lines, Inc., and its affiliated companies and vice-president of Florida Motor Lines, Inc., has been appointed manager of the Northern Texas Traction Company and Tarrant County Traction Company.

Philip M. Wentworth, formerly man-

office which had existed after the resignation of H. M. Gould.

Mr. Smith has worked up through the ranks in various positions from conductor in the interurban service.

His electric railway experience began in 1905 when he started as conductor on the Jackson division of the Detroit United Railway, the Detroit, Ypsilanti, Ann Arbor and Jackson line. Prior to that he had been in the train service of the Chicago, Milwaukee & St. Paul Railroad. He was made carhouse foreman with the Detroit United lines in 1907. From that position he was promoted successively to assistant division superintendent in 1911, night superintendent in 1916, supervisor of fare collections in 1918 and division superintendent in 1919.

On May 15, 1922, he was transferred to the Department of Street Railways with the city lines when they were taken over by the city from the Detroit United Railway. He was made assistant superintendent of transportation in July, 1922, and superintendent of operation on Dec. 1, 1924. His next promotion was to general superintend-

ager of Cape Breton Electric Company, Ltd., has been appointed manager of Florida Motor Lines, Inc., and its affiliated companies, and elected vice-president of Florida Motor Lines, Inc.

Leon E. Seekins, formerly assistant to the manager of the Lowell Electric Light Corporation, has been appointed manager of the Cape Breton Electric Company, Ltd.

Luke C. Bradley, formerly president of the Virginia Electric & Power Company, assumed his new duties as president of the Rhode Island Public Service Company on Feb. 20.

William E. Wood is now president of the Virginia Electric & Power Company.

The two last-named changes were announced in the *ELECTRIC RAILWAY JOURNAL* issue of Feb. 12, page 313.

Los Angeles Superintendents Exchange Positions

Ernest R. Dye, superintendent at Division 3 of the Los Angeles Railway, Los Angeles, Cal., and George E. Ferguson, superintendent at Division 5, exchanged positions on Feb. 15.

Superintendent Dye went to the company in 1899, serving as a conductor out of Division 1, and was later transferred to Division 5. He resigned from the service in February, 1902, but was re-employed as conductor at Division 1 in August, 1903. In August, 1919, he became extra student instructor at Division 5, regular instructor in February, 1920, and was made superintendent of Division 3 in February, 1921.

Superintendent Ferguson entered the service of the company in October, 1905, as conductor out of Division 2. He resigned in April, 1912, and was re-employed a year later as motorman. In February, 1914, he was made extra dispatcher, and regular dispatcher in June, 1917. About three years later he entered the schedule department, was made special representative of the superintendent of operation in April, 1921, acting division superintendent of Division 5 in May, 1924, and regular superintendent of that division in January, 1925.

Neal Brewster was nominated by Governor Smith, and his name sent on Feb. 28 to the Senate for confirmation as a member of the Public Service Commission, to fill the vacancy caused by the expiration of the term of Charles Van Voorhis. Mr. Brewster was born at Weedsport, Cayuga County, N. Y., Jan. 30, 1879. He was graduated from Syracuse University in 1902 and was admitted to the bar the same year. Since that time he has been engaged in the practice of law in Syracuse, being a member of the law firm of Lee, Brewster & Johnson. He was Collector of Internal Revenue at Syracuse from 1915 to 1920 and City Comptroller of Syracuse from 1922 to 1926.

Sir J. Henry Lamperd, traffic expert of Melbourne, Australia, and head of the traffic system there, is on a visit to the United States to study traffic regulation. He arrived in Philadelphia recently for a brief study of Philadelphia's Traffic Bureau. He intends to survey conditions in other large American cities.

Richmond's New President

"Will" Wood Has Been with Stone & Webster Twenty Years in Many Capacities

Just twenty years ago a youth fresh from algebraic tussles at the Georgia Institute of Technology entered the already famous office of Stone & Webster at Boston to match his ingratiating South Carolinian accent against the more customary twang of the resident Yankees. It was "Will" Wood, and "Will" Wood it has remained to this day, although the more formal cognomen of "W. E. Wood" has been gracing more and more important documents with the passing years.

To be "cabined, cribbed, confined" to an office stool was not to young Wood's liking. After a year in Boston, he was transferred to Jacksonville to go through a realistic course of nuts to soup, viz., from the nuts on the controller to the superintendency of the Jacksonville Traction Company in the period 1907-1912.

Rising Stone & Webster men appreciate the adage that "a rolling stone

the reins at Richmond on July 1, 1925. Within the next year and a half the brilliant results accomplished there in better public relations led to a flattering offer to Mr. Bradley to accept the presidency of the Rhode Island Public Service Company, Providence, R. I. With twenty years service in the Stone & Webster organization, "Will" Wood, in February, 1927, had become president of one of its largest properties. Thus, the bare outline of achievement.

As "Will" Wood toiled upward, he never forgot to help his fellow-workers on or off the property. The records show that almost from the first he was an eager worker in territorial associations for mutual service. In 1925, his last year in Texas, he was elected president of the Southwestern Public Service Association. Perhaps he treasures even more than this honor from fellow-craftsmen the warm-hearted message which a group of big Houston men spread on the parchment, when he left for Virginia, to let him know he was loved as a man and respected as a useful citizen whose place in community affairs would not be easily filled.

As for the utility men of the Old Dominion, they waited no longer than the first convention to which Mr. Wood was a delegate to make him their president.

"How do they do it?" is the question always asked about men who get there. No copybook maxims will be quoted about "Will" Wood, but let this comment of a co-worker suffice: "He's so square and good-natured that you just can't get mad at him."



W. E. Wood

gathers no moss," barnacles or other impedimenta toward an unclogged judgment. In 1916 "Will" Wood made his first shift by going to Houston as general superintendent. A little later he learned something of the noble width of Texas in becoming superintendent of the El Paso Electric Company, but in 1918 he returned as a neighbor to Houston in becoming local manager of the Galveston Electric Company. Two years later saw him manager of the Houston Electric Company and the Galveston-Houston Electric Railway.

UNDER MR. BRADLEY'S EYE

In these Texan years the ability, sincerity and likableness of "Will" Wood had been noted at first hand by the keen, kindly eyes of Luke C. Bradley, manager of the southwestern district of Stone & Webster. So when that firm took over the Virginia Railway (now Electric) & Power Company, with Mr. Bradley as president of the new concern, it was "Will" Wood who was invited to become ranking vice-president.

These two men, with other able companions brought up from Texas, took

Obituary

Charles Sidney Baxter died recently at his winter home in Miami, Fla. He was in his 60th year. He was admitted to the bar in 1895 and for some years was in charge of the law department of the Boston Elevated Railway, Boston, Mass. He was Mayor of Medford, Mass., for four years and took an active part in many political campaigns.

Edward Carpenter Wood, president of the Mica Insulator Company of New York City, Chicago and Schenectady, N. Y., died on Feb. 17 in New York. Mr. Wood was a pioneer in the mica insulation industry and played an important part in the development of "Micanite," which was put on the market by the Mica Insulator Company in 1893 and of which the company has been the sole manufacturer ever since. Mr. Wood had been identified with the Mica Insulator Company since its inception in 1893.

Edwin Samuel Ely, consulting engineer for the Virginia Electric & Power Company, now under Stone & Webster management, died on Jan. 16 at Norfolk, Va. He had rendered a truly valuable service to his company, and, after all, a service in favor of the community. Through the 25 years that he was associated with the system and its people he was always to be found the same—a dealer in kindness and fair play toward his friends and business associates and a clean influence for good throughout the organization.

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

Central Western Roads Go Ahead

Expenditures for Rolling Stock Feature
\$7,500,000 Programs of Nine
Ohio Companies

Many electric railways in Ohio are planning betterments and improvements of rolling stock and equipment this year.

The Cincinnati Street Railway proposes capital expenditures in the amount of \$3,000,000. This will go toward new shops, additions and betterments to way and structures and miscellaneous improvements.

The Cleveland Railway is planning an expenditure of \$2,050,000 for carhouses, new cars and buses.

While the Community Traction Company, Toledo, has not definitely decided on the new capital expenditures for this year, due to the fact that the proposed ordinance under which such expenditures would be made has not been passed, it is estimated that approximately \$1,500,000 is required for rehabilitation not absolutely essential to the operation of the property but highly desirable.

The Chillicothe Electric Railway, Light & Power Company and the Ohio Utilities Company, which are owned and operated by the same interests, will expend \$500,000, but the bulk of it will go toward the electric light department.

The Wheeling Traction Company, which operates in Washington, Jefferson and Belmont Counties, Ohio, probably will spend from \$200,000 to \$250,000 on track and roadway in Belmont County this year. In this instance it seems unlikely that any new rolling stock will be acquired during this year.

According to J. M. Pogue, general manager of the Indiana, Columbus & Eastern Traction Company, with headquarters in Springfield, Ohio, about \$130,000 will be expended this year. Of this amount \$80,000 will go toward track improvements and \$50,000 toward new freight equipment.

The Cleveland Southwestern Railway & Light Company will expend approximately \$75,000 for way, structures and power.

Track of the Steubenville, East Liverpool & Beaver Valley Traction Company east of Steubenville will be relocated at a cost of about \$30,000.

The Dayton & Western Traction Company is committed to no fixed program of capital expenditure.

The Toledo & Western Railway, the Lima-Toledo Railroad and the Lima City Street Railway have not made their estimates for 1927 up to this time.

The Lake Shore Electric Railway will spend \$150,000. New car seats will cost \$30,000, snow-fighting equipment \$10,000, overhead construction

\$100,000 and track improvement \$10,000. The Lorain Street Railroad, controlled by the Lake Shore, will spend \$100,000, of which \$60,000 will go toward passenger cars and \$25,000 for substations and \$15,000 for carhouses.

Lead Production Higher

January lead production by countries which supplied about 85 per cent of the world's output in 1925 was calculated last week at 131,783 tons, compared with 118,845 tons in January, 1926. The monthly average output in 1926 was 122,023 tons.

First Reservation Sought for Car Space at Cleveland

Fred Dell, director of exhibits of the American Electric Railway Association, announced on March 4 that he had received his first request for track space at the Cleveland convention. J. R. Blackhall, vice-president of the Chicago & Joliet Electric Railway, Joliet, Ill., has indicated that he will show a new type of city car in Cleveland next October. One of the interurban cars of this company was exhibited at Cleveland last year by the Cummings Car & Coach Company. The receipt of this request for reservation of space seven months prior to the convention indicates quick response to the appeal of President Sawyer to the industry for a representative car exhibit.

Electrification Extended by Mexican Railway

The officials of the Mexican Railway Company, Ltd., have arranged for the extension of the electric zone now operating over the Maltrata Incline eastward to Paso del Macho, a distance of about 22 miles. The most difficult portion of this grade section was converted to electrical operation in 1924, and during the past year an additional 17 miles was placed in service.

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

When this extension is completed there will be a total of about 70 miles of electrified track running through the severest grade section of the line between Mexico City and Vera Cruz.

Grades run as high as 5.25 per cent maximum, with an average of 4.7 per cent for about 25 miles. The remainder of the electric zone ranges from 2 to 3 per cent. All trains on these grades will be handled with regenerative electric braking and it is expected that the same 150-ton locomotives used on the original electric zone will be used on the extension.

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

American Brake Shoe Has Record Year

American Brake Shoe & Foundry Company reports for 1926 net profit of \$3,029,216, after charges, depreciation and federal taxes. This is equivalent, after preferred dividends, to \$15.04 a share on the 156,928 shares of no-par-value common stock. It compares with \$2,786,607, or \$13.57 a share, on 156,093 shares outstanding in 1925.

The balance sheet as of Dec. 31 shows total assets of \$30,108,590, against \$28,747,182 at the close of 1925, and a profit and loss surplus of \$9,640,486, compared with \$8,119,314.

In his report to the stockholders, Joseph B. Terbell, president of the company, writes:

A new wheel plant is under construction at Toledo, Ohio, similar in design to the new St. Louis plant. The building of this plant is necessary in order to take care of the increasing business in that district.

A further extension of the car wheel company occurred in December by the purchase of the plant and equipment of the New York Car Wheel Company of Indiana, located at Hammond, Ind. Your companies have not heretofore sold wheels in the Chicago territory. The Hammond plant is located on one of the belt lines of Chicago, giving it access to the various railroads entering that city. Based upon the previous tonnage of wheels produced by this plant, we expect the earnings will justify its purchase.

A new brakeshoe plant has been established in Pittsburgh, Pa., by converting the plant of the Pennsylvania Casting & Machine Works into a brakeshoe foundry. With the addition of this plant we now have, with few exceptions, brakeshoe plants at all of the larger railroad centers.

During the year the American Brake Materials Corporation was incorporated to take over the manufacture and sale of "brakebloks" designed for use on automotive equipment. It is expected that by the first of April the corporation will begin operations at Detroit, where new machinery is now being installed.

Our two principal associated companies, the Ramapo Ajax Corporation and the American Manganese Steel Company, have each shown satisfactory results, the latter having enjoyed the largest net earnings in its history.

Time Extended for Work on Texas Interurban

The City Commission at Dallas, Tex., has voted the Dallas Southwestern Traction Company until Dec. 31, 1927, to construct 5 miles of the proposed interurban line from Dallas to Irving.

The action was taken at the request of E. P. Turner in compliance with

provisions of the charter franchise granted the company and on payment by the company of a forfeit of \$1,400 in bonus money of the \$15,000 fund originally deposited with the city when the franchise was granted.

Mr. Turner in the application for an extension of time pointed out that at least 82 per cent of the grading for the line already has been completed, but that the company has so far been unable to dispose of bonds for financing the completion of the line.

It originally had been stipulated that the company must have completed 10 miles of the line by a certain date, which has been extended previously from year to year. By the action just taken the City Commission reduced the mileage that must be constructed in the time limit from 10 to 5.

Brill 177-E Trucks for Fitchburg Order

Brill 177-E trucks will be used on the four double-truck safety cars ordered by the Fitchburg & Leominster Street Railway, Fitchburg, Mass., and also on the 25 double-truck safety cars recently ordered by the Eastern Massachusetts Street Railway. In announcing the award of the Fitchburg & Leominster Street Railway order, the JOURNAL inadvertently gave the truck number as 117-E instead of 177-E.

Wheeling Company Operating New Cars

Following are specifications for the fifteen double-truck light-weight cars mentioned in the JOURNAL of Sept. 4, 1926, as having been ordered by the Wheeling Public Service Company, Wheeling, W. Va., from the G. C. Kuhlman Car Company, a subsidiary

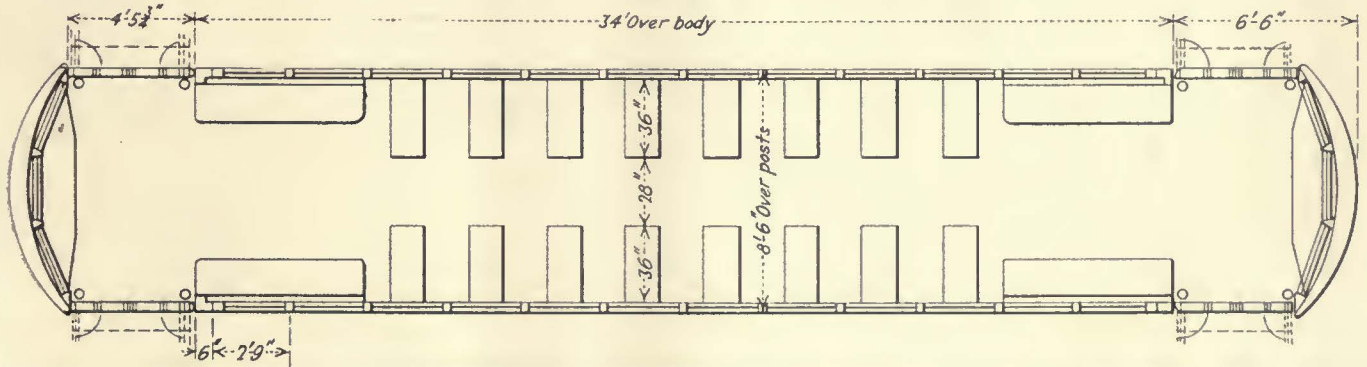


Spacious Interior of the New Cars Recently Delivered by the G. C. Kuhlman Car Company to the Wheeling Public Service Company

of the J. G. Brill Company. The new cars were delivered on Dec. 27, 1926, and are now in service. Order for the rolling stock was placed July 25, 1926.

Seating capacity	48
Weights:	
Car body	17,600 (estimated) lb.
Trucks	6,110 (including gears) lb.
Equipment	9,420 (estimated) lb.
Total	33,130 (estimated) lb.
Bolster centers, length	24 ft. 0 in.
Length over all	47 ft. 0 in.
Truck wheelbase	5 ft. 4 in.
Width over all	8 ft. 8 in.
Height, rail to trolley base	10 ft. 8 in.
Body	Semi-ste l
Interior trim	Mahogany
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Axles	Brill
Bumpers	Channel
Car signal system	Faraday
Car trimmings	Kuhlman
Center and side bearings	Brill

Control	K-35
Curtain fixtures	Rex
Curtain material	Pantasote
Destination signs	Hunter
Door mechanism	National Pneumatic
Fenders	Steel pilot
Finish	O'Brien enamel
Hand brakes	Brill, vertical handle
Heater equipment	Utility
Headlights	Golden Glow
Journal boxes	Brill
Lightning arresters	Westinghouse
Motors	Four Westinghouse No. 514-A, outside hung
Sanders	Ni hois-Lin'ern
Sash fixtures	Rex
Seats	Brill 201-B
Seating material	Genuine Spanish grain leather
Slack adjuster	Westinghouse
Springs	Brill
Step treads	Kass
Trolley catchers	Knutson No. 5
Trolley base	U. S. No. 20
Trucks	Brill 177-E
Ventilators	Nichols-Lintner
Wheels	28-in.



Fifteen of These Cars Are Now Serving the Citizens of Wheeling, W. Va.

50 to 100 Cars for Toronto

The Toronto Transportation Commission is to ask tenders on 50 or 100 new cars, the number to be bought depending somewhat on the reduction which may be obtained for quantity. The purchase will be financed out of the commission's own reserves, which are available to the extent of \$1,500,000. Chairman Ellis of the commission is reported to have said:

We anticipate buying the cars in Canada, but will not build them ourselves. They are for use on existing routes. Their purchase will not mean the abandonment of cars already in use—the one-man cars, for instance? They will be additional. The one-man car is thoroughly established everywhere and the technical journals are full of its praises.

Charlotte Company Experiments in Building Cars

Mechanics of the Southern Public Utilities Company, Charlotte, N. C., recently turned out from the company's Charlotte car shops a new 18-ton, 40-passenger car which, with the exception of trucks and air brake equipment, was built from stem to stern by the company's force. The work was under the direction of W. B. Osborne, master mechanic, and the new car cost approximately \$10,000.

Rolling Stock

Macon Railway & Light Company, Macon, Ga., if a program suggested to the city is approved, will purchase sixteen new cars and rebuild old ones retained.

Burlington Traction Company, Burlington, Vt., is putting Johnson D. M. fare boxes on its rolling stock in connection with a change to one-man operation.

Market Street Railway, San Francisco, Cal., is planning several new features for the 73 cars now being constructed in its shop. All cars will have crosswise seats, leather-cushioned. In the smoking compartments the latest model rattan and wicker seats will be used. The smokers will be glassed in on one side and open on the other. The open sides will be equipped with tight-fitting storm curtains. When these are in use there will be ample light from the glass windows opposite, and in the heat of summer the glass windows can be lowered.

Jamestown Motor Bus Transportation Company, Jamestown, N. Y., subsidiary of the Jamestown Street Railway, has purchased six 21-passenger buses from the Reo Motor Car Company, to be placed in service on the company's city bus routes. The new buses are of the street car type, with pay as you enter facilities. An especially attractive color scheme has been worked out. The bodies have been painted a Quaker gray, with a town car blue stripe and letterboard.

Western Ohio Railway, Lima, Ohio, has installed its first chair car, and an exhibition trip from Lima to Wapakoneta, Ohio, and return was arranged for a party of officials and guests. The new car is divided into three compartments. The major compartment is

equipped with bucket type chairs, fitted with air cushions and luxuriously finished in plush. The seats in the smoking compartment are finished in Spanish leather. The company plans to complete the reconstruction of its cars at the rate of one car a month.

Los Angeles Railway, Los Angeles, Cal., has equipped all of its cars and buses with Johnson D. M. fare boxes, designed to accept pennies, nickels and dimes and also tokens of 0.650 in. diameter. The tokens are being sold six for 50 cents.

Trade Notes

Hubbard & Company, manufacturers of shovels, spades, scoops and railroad track equipment, recently held their third annual sales convention in Pittsburgh, Pa. The meeting was attended by all the company's salesmen, district managers, and three plant managers. In addition to discussing the sales and advertising program, the force heard several stirring sales talks made by officials of several larger manufacturing concerns.

Copper and Brass Research Association announces the appointment of H. A. Call of New York as mid-Western representative. Mr. Call has left New York to establish a branch in St. Louis.

H. D. James has been promoted to consulting control engineer of the Westinghouse Electric & Manufacturing Company, and E. B. Newill appointed manager of the control engineering department, according to a recent announcement by Vice-President Rugg. Mr. James, a native of Baltimore and a graduate of the University of Pennsylvania, has been continuously associated with the Westinghouse company since 1904. He has been president of the Engineering Society of Western Pennsylvania, chairman of the subcommittee of the Electric Safety Conference and chairman of the control section of the Electric Power Club and is an original Fellow of the American Institute of Electrical Engineers. Mr. Newill, a native of Atlanta, Ga., has been with the Westinghouse company since 1915. He is a graduate of the Georgia Institute of Technology.

Sullivan Machinery Company, Chicago, Ill., announces that it will occupy booths 122 and 123 at the Railway

Appliance Exhibition in the Coliseum, Chicago, March 7 to 10 inclusive. Equipment to be exhibited will include portable and stationary air compressors; an operating model of the Sullivan air lift pump; one-man hammer drills; pneumatic concrete breakers; clay spaders; and a portable Turbinair hoist. The company will be represented by Joseph H. Brown, sales manager, Chicago; R. W. Scott and George Rowen, Chicago sales department; and by John Oliphant, manager pneumatic pumping department.

W. C. Stettinius, president of the American Hammered Piston Ring Company, Baltimore, Md., has been appointed a member of the merchandising committee of the Automotive Equipment Association, filling the vacancy caused by the resignation of T. H. Quinn of the National Lamp Works of the General Electric Company. Mr. Stettinius at the present time is president of the N.S.P.A., having been elected to that office at the association's meeting last November, and has also in the past served on the service parts committee of the A.E.A.

New Advertising Literature

Charles Cory & Son, Inc., 183 Varick Street, New York City, are now distributing their new bulletin, No. 60-29-A, describing annunciators, bells, button and signal equipment. The bulletin contains 60 pages of descriptive text, 117 illustrations, alphabetical, numerical and thumb indexes.

Ohio Brass Company, Mansfield, Ohio, has recently issued a folder describing its Form 4 trolley base. Outstanding features of construction, as claimed by the manufacturer, are: The use of hardened steel bushings on the hinged fork which pivots with the vertical movement of the trolley pole; the use of forged steel eyes within closed-in end tension springs; use of renewable bearing spools on the lower ends of the tension springs, where they are anchored to the turret arm studs; and the use of a long trolley pole supporting clamp.

United States Rubber Company is issuing a facsimile of *World's Work* magazine, in which is reprinted "The Story of Rubber," which appeared in that magazine for January, 1927.

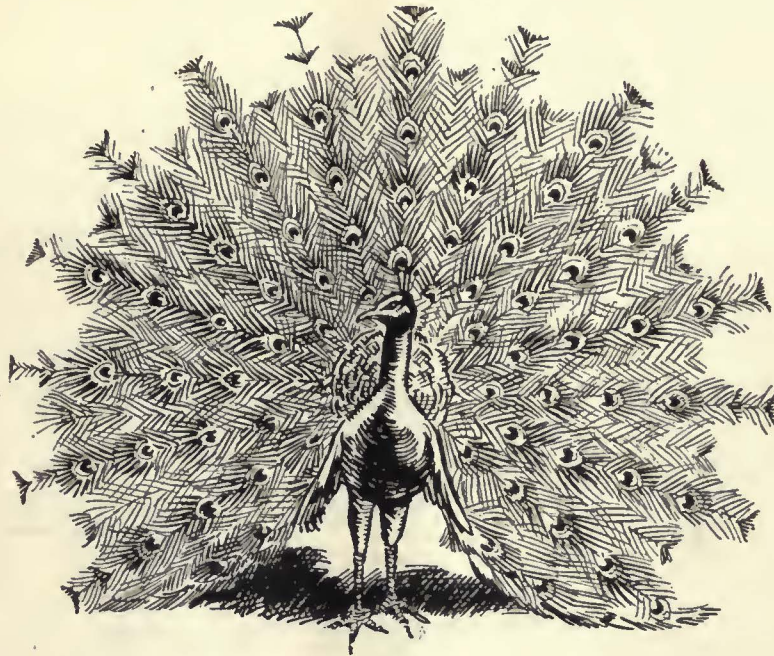
Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., is mailing out a folder describing its industrial electric furnaces. The folder includes specifications on the type H box furnace, type O lead and salt baths, and type J lead and salt pots.

Wiswell Improved Railroad Crossing Company, Chicago, Ill., is issuing a circular letter descriptive of its noiseless crossings, to which is attached a testimonial letter from W. L. Roller, engineer of maintenance of way Hocking Valley Railway Company, Columbus, Ohio.

Mack Trucks, Inc., New York, N. Y., has just issued an elaborate poster illustrating the effects of torque or twisting efforts upon crankshafts of different diameters.

Metal, Coal and Material Prices

Metals—New York		Mar. 1, 1927
Copper, electrolytic, cents per lb.	.....	13.15
Copper wire, cents per lb.	.....	15.25
Lead, cents per lb.	.....	7.55
Zinc, cents per lb.	.....	7.16
Tin, Straits, cents per lb.	.....	69.55
Bituminous Coal, L.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	.....	\$4.625
Somerset mine run, Boston, net tons	.....	1.925
Pittsburgh mine run, Pittsburgh, net tons	.....	1.85
Franklin, Ill., screenings, Chicago, net tons	.....	2.175
Central, Ill., screenings, Chicago, net tons	.....	1.875
Kansas screenings, Kansas City, net tons	.....	2.425
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	.....	\$5.50
Weatherproof wire base, N. Y., cents per lb.	.....	16.75
Cement, Chicago net prices, without bags	.....	2.05
Linseed oil (5-bbl. lots), N. Y., cents per lb.	.....	10.50
White lead in oil (100-lb. keg), N. Y., cents per lb.	.....	14.50
Turpentine (bbl. lots), N. Y., per gal.	.....	\$0.72



Summer or Winter— “Peacock” Staffless Brakes!

Reg. U. S. Pat. Off.

Modern car buyers are specifying “Peacock” Staffless Brakes because they know either from their own experience or from that of others that the “Peacock” Staffless will positively hold them during all seasons of the year and regardless of climatic conditions.

Many other features,—such as little platform space occupancy—low installation and maintenance costs—simple, yet dependable operation,—absolute safety—three times the braking power of ordinary hand brakes, almost unlimited chain winding capacity (12 feet if necessary) without jamming or binding—excess of slack cannot put them out of commission—and many others—make “Peacock” Staffless Brakes an important factor in modern car specifications! That is why they are included in almost all new car specifications.

May we mail you full details?



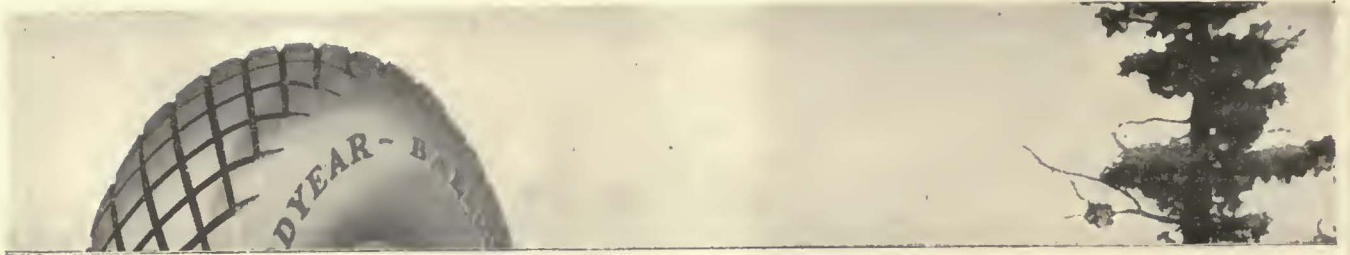
The
Peacock
Staffless

National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada



What SUPERTWIST Adds to Goodyear Tires



One of the Goodyear-equipped fleet of buses operated by the Yosemite Park and Curry Co.

You know what rugged strength and long life have always been built into Goodyear Pneumatic Bus Tires.

Now you may confidently expect even greater service from Goodyears in motorbus service, because Goodyear Pneumatic Bus Tires are now made with SUPERTWIST.

SUPERTWIST is the extra elastic, extra enduring new material specially developed by Goodyear for Goodyear balloon tires, motorbus and heavy duty cord tires.

It far outstretches ordinary cotton cord, and has a maximum flexing power that yields under impact, protecting the tire from rupture, stone bruise and other in-

juries. It thus insures virtually double the carcass life of the tire.

Other exclusive features of the Goodyear Pneumatic Tire construction for motorbus service are (1) the new Goodyear band-building method; (2) the new Goodyear breaker; (3) the new Goodyear bead—patent applied for, and (4) the famous All-Weather Tread.

These advantages you get only in Goodyear Pneumatic Bus Tires—the only motorbus tires made of SUPERTWIST.

They are real advantages, because they result in the utmost durability, tractive power, road safety, riding comfort and long, trouble-free mileage at low cost.

Goodyear Means Good Wear

GOODYEAR

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

21-pass. Studebaker Pay-Enter
Street-car-type bus

\$5125 F. O. B.
factory



Ohio Valley Bus Co. Makes Fourth Purchase of Studebaker Busses in Ten Months

BECAUSE of the splendid records established by their Studebaker Busses, the Ohio Valley Bus Co. of Huntington, W. Va., a subsidiary of the American Gas and Electric Co., of N. Y., continues to specify Studebakers when new equipment is needed.

The recent delivery of three Studebaker 21-Passenger-Street-Car-Type Busses gives this company a total of eleven Studebakers, all purchased within 10 months and in direct competition with other makes.

These consistent repeat orders for Studebaker bus equipment indicate very definitely the entire satisfaction given by the units originally purchased.

Owners of Studebaker busses make more net profit per unit in operation because Studebaker busses cost less to

buy, have a lower depreciation rate, maintenance costs are less and operating costs decidedly lower than with any heavy truck type built.

There are 265 Studebaker busses with mileage records ranging from 100,000 to 300,000 miles and upwards, demonstrating the sturdy qualities and long life of Studebaker equipment. Depreciation figured at a conservative 20% amounts to 2.5 cents a mile as against 4 cents for the large truck type bus. And economy of operation is proved by an investigation of six different bus chassis in 8 cities which revealed that it costs 7 to 9 cents less per mile to operate a Studebaker Bus.

Such evidence indicates the relative advantages of Studebaker busses and shows why first-time Studebaker bus owners are repeat purchasers when new equipment is needed.

L
—first cost
—operating cost
—maintenance cost
—depreciation cost
Lower

S T U D E B A K E R

— [Seventy-Five Years Young] —



GUM-DIPPING

The Process for Extra Miles

Firestone dips the cords of the carcass in a rubber solution, saturating and insulating every fiber of every cord with rubber.

This minimizes friction and wear, reducing tire troubles, and gives these big tires extra stamina and endurance for long speedy runs.

The special scientifically designed tread grips the road and holds the bus to its

course on slippery pavements or rounding turns—giving to passengers safety, comfort and mental composure.

The biggest bus fleets in all parts of the country—guided by careful cost records—standardize on Firestone Gum-Dipped Tires. Ask the nearest Firestone dealer or branch for performance facts concerning Gum-Dipped tires in bus service.

MOST MILES PER DOLLAR

Firestone

GUM-DIPPED TIRES

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER.... *Harvey Firestone*



The cars illustrated were built by the J. G. Brill Company, Philadelphia, and finished in Duco, for Compañia Chilena de Electricidad, Santiago, Chile.

Make the car itself do a subtle selling job

IT'S subtle—but it's important. If your cars convey, to the men and women who buy rides in them, a favorable impression, they will have, in large measure, a favorable impression toward the company that operates them.

If your cars are finished with Duco, you can be proud of their appearance. For Duco withstands the ravages of snow, sleet, ice, dust, blistering suns. A Duco finish means a finish *that stays new*.

So much for the selling job. On the side of costs, what about Duco? Let one of our Railway Finishing Service Engineers tell you what Duco can do in keeping down maintenance and upkeep costs.



REG. U.S. PAT. OFF.

Duco is the correct finishing material for railway equipment. For information write to the E. I. du Pont de Nemours & Co., Inc., Chemical Products Division, Parlin, N. J., 2100 Eston Ave., Chicago, Ill., or 569 Mission St., San Francisco, Cal.

There is only ONE Duco—Du Pont Duco



“The best tires I have ever had”

Kansas City, Kas.
January 6th, 1927.

Kelly-Springfield Tire Co.,
Kansas City, Mo.
Gentlemen:

Being rather proud of my little twenty-one passenger bus all dressed up in Kellys, I had a picture taken of it and am sending you a copy.

This bus travels 140 miles per day and some of these tires have gone about 10,000 miles with very little signs of wear and no trouble at all, not even a puncture. They are 30 x 5 Kelly Heavy-Duty Cords.

They are the best tires I have ever had.

Yours very truly,

Almer Coltharp

Other bus operators, too, have discovered that the extra mileage built into Kelly Heavy-Duty Cords, makes them most economical. To cut down operating costs Kelly must give more mileage and less trouble. Bus owners from coast to coast have found that they do—that’s why so many of them are standardizing on Kellys.

KELLY SPRINGFIELD TIRE CO.
250 West 57th Street New York, N. Y.



KELLY HEAVY DUTY CORD

Mack

Mack

Mack

Ma

Performance Counts!

Mack

Mack

ack

Mack

**Repeat Orders
are based on
Performance**

Ma

Mack

k

Mack

Mack

Mack

Mack

Mac

b

After their experience Operators

Mack's latest

20 Six-cylinder - - - -
gas-electric drive Mack buses

37 Six-cylinder - - - -
gas-electric drive Mack buses

70 Four-cylinder - -
gas-electric drive Mack buses

40 Six-cylinder - - - -
mechanical drive Mack buses

Newark buys
147 more Macks!

after comparison —

choose Macks

large orders

- - United Traction Co.

Albany, N. Y.

- - Public Service Corp. of N. J.

Newark, N. J.

- - Public Service Corp. of N. J.

Newark, N. J.

- - Public Service Corp. of N. J.

Newark, N. J.

Albany buys

20 more Macks!

Mack Owners Repeat on Macks After Their Experience With All Other Makes of Buses

Recent Repeat Orders

Boston & Worcester Street Railway

Yakima Valley Transportation Co.

Utah Light and Traction Co.

Lincoln Traction Co.

United Traction Co.

Northern Ohio Power and Light Co.

Boston Elevated Railway

Virginia Electric and Power Co.

The Connecticut Co.

Houston Electric Co.

Third Avenue Railway Co.

Boise Street Car Co.

Public Service Corp. of New Jersey

Twin City Rapid Transit Co.

Illinois Power Co.

Utah Idaho Central R.R. Co.

Tri-City Railway Co.

City of Alexandria (La.)

Community Traction Co.

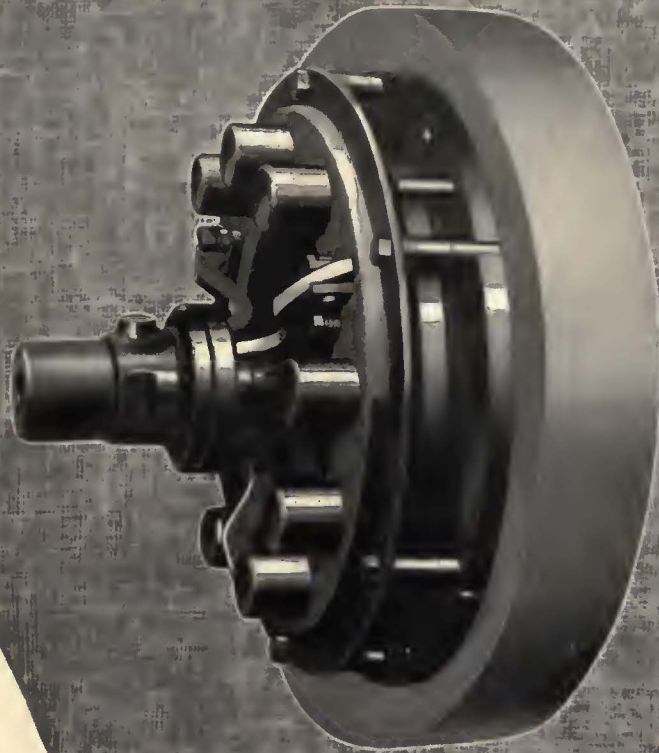
Assuredly — Performance Counts!

Mack Trucks, Inc.

International Motor Company

25 Broadway, New York City

Long Products - Automotive Clutches and Radiators



Accurately engineered and proven in its worth, the Long Clutch makes for the utmost in smooth, silent clutch operation.

We are offering you this service.

THE LONG MANUFACTURING COMPANY
DETROIT MICHIGAN

LONG



You are your Credit Man When it comes to Buying Orders

Has he the ability to finance your orders?

* * *

A reliable aid is here—in this publication. Most of the manufacturers in this issue have been running their advertising in this publication continuously year after year.

They are established. They do not advertise something they cannot deliver. They cannot deliberately exaggerate product merit or institutional service.

Why? Because this publication is A.B.P.—meaning it is a member of the Associated Business Papers. This means, broadly, that this publisher has that basic A.B.P. requirement—integrity.

If a product you need is not advertised in this publication, ask the publisher to direct you to a reliable source.

THE orders you take come under the watchful eye of the credit man.

How about the orders your company places—the orders that you make?

If the reliability of the manufacturer is checked when you sell, it should be checked when you buy.

Whether his is a dependable source of purchase is important to learn before—not after his products are in your plant.

What can you expect in the way of prompt and continuous deliveries?

What about quality uniformity?

This publication is a member of

The ASSOCIATED BUSINESS PAPERS, Inc.

*An association of none but qualified publications reaching
the principal fields of trade and industry*

Executive Offices: 52 Vanderbilt Ave., New York, N. Y.

101 YEARS OF MANUFACTURING EXPERIENCE

Cane Webbing may be ordered through any H-W sales office.



Interior of one of the new Eastern Texas Interurban Cars, showing the installation of our No. 11-F.



JUST WHAT THEY WANTED!

THE Eastern Texas Interurban Company was looking for an unusual seat—one that would afford more seating capacity and comfort in a minimum amount of space.

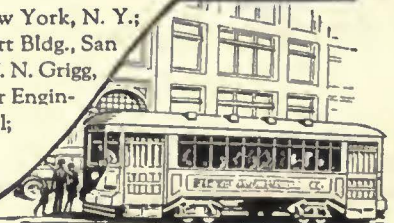
They found just such a seat in the new Heywood-Wakefield 11-F (shown above). This new unit, adapted to interurban and long-distance use, actually affords greater comfort and seating capacity in the shortest over-all length of any seat now on the market. The padded backs are pitched at a restful angle. The deep, roomy seats have comfy spring cushions over our specially built-up construction and the underframe of the seat is of durable pressed steel.

We shall be glad to send you complete information on this practical seat, as well as a copy of our new Bus Seat Catalogue.



Heywood-Wakefield
REG. U.S. PAT. OFF.

Heywood-Wakefield Co., Wakefield, Mass.; 516 West 34th St., New York, N. Y.; 439 Railway Exchange Bldg., Chicago, Ill. H. G. Cook, Hobart Bldg., San Francisco, Cal. The G. F. Cotter Supply Co., Houston, Texas. F. N. Grigg, 630 Louisiana Ave., Washington, D. C. The Railway & Power Engineering Corp., 133 Eastern Ave., Toronto; Montreal; Winnipeg, Canada.



In Large Cities



in **DETROIT** *The Department of Street Railways of the City of Detroit is now operating 198 Graham Brothers Motor Coaches.*



in **GRAND ISLAND** *These Graham Brothers Motor Coaches provide the public transportation for this Nebraska city.*

GRAHAM
 SOLD BY DODGE BROTHERS
 DEALERS EVERYWHERE **MOTOR**

and in Small

Sales of Graham Brothers 21-Passenger Street Car Type Motor Coaches Continue to Emphasize the Trend Toward the Medium Capacity Motor Coach

Ruggedness of construction, adaptability, ease of handling, comfort, speed, dependability—all these qualities so marked in Graham Brothers Motor Coaches are essential to successful motor coach operation anywhere.

And Graham Brothers fleets are operating, from coast to coast, in large cities and in small, with uniform satisfaction.

The fine appearance of Graham

Brothers 21-Passenger street car type coach attracts patronage. Its comfortable interior, its smooth, quiet operation and its dependability hold that patronage . . . And it stands up in the rigorous service of street railway operation. Service, when needed, is available from Dodge Brothers Dealers—always and everywhere.

GRAHAM BROTHERS
EVANSVILLE — DETROIT — STOCKTON
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED, TORONTO, ONTARIO

Standard 21-Passenger Street Car Type, complete, \$3815

12-Passenger Parlor Coach, complete, \$3750

f. o. b. Detroit

BROTHERS

COACHES





Why Don't They Ride the Street Cars?

STREET car riders must be sold against keen competition. Present day riders are discriminating. They expect equipment equal in attractiveness to the private automobiles which crowd the boulevards. They expect comfort and safety as well as speed and frequent service.

The best salesman of street car rides is the right kind of a car—the modern car that invites the rider and is so economical to operate that it can be run on a frequent, fast schedule.

The modern car—one utilizing HASKELITE and PLYMETL fully—has demonstrated its ability to sell rides to an unsurpassed degree. Its external appearance—with smooth-as-glass PLYMETL side panels and moulded HASKELITE roofs, just naturally attracts the riders. Its interior appearance with beautiful HASKELITE linings fully lives up to expectations. The low floor and step level made possible by the HASKELITE floor and the ample headroom due to HASKELITE roof construction are additional factors of attractiveness and comfort. Added to all this are the advantages of quiet operation, a high degree of heat insulation and the safety that comes from the super-strength of HASKELITE and PLYMETL.

Yes, they *will* ride the right kind of a street car. Note the representative list of big companies using HASKELITE and PLYMETL for car and bus construction.

Ask for our blue print booklets for full information on these HASKELITE products for street car and bus use.

Representative users of HASKELITE and PLYMETL

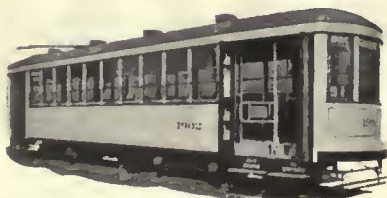
Boston and Maine R.R. Co.,
Boston, Mass.
Chicago, North Shore & Mil. Ry.
Highwood, Ill.
Chicago Surface Lines,
Chicago, Ill.
Cincinnati Traction Co.,
Cincinnati, Ohio
Columbus Ry. & Light Co.
Columbus, Ohio
Denver Tramway Company
Denver, Colo.
Detroit United Railway,
Detroit, Mich.
Fort Smith Light & Traction Co.,
Fort Smith, Ark.
Galveston-Houston Elec. Co.,
Galveston, Texas
Grand Rapids Ry. Co.,
Grand Rapids, Michigan
Georgia Ry. & Power Co.,
Atlanta, Georgia
Illinois Traction, Inc.,
Chicago, Ill.
Indiana Service Corp.,
Fort Wayne, Ind.
Los Angeles Railway Corp.,
Los Angeles, California
Milwaukee Elec. Ry. & Light Co.,
Milwaukee, Wisc.
Monongahela West Penn Public Service,
Co., Fairmont, West Va.
Montreal Tramways Co.,
Montreal, Que., Can.
Municipal Ry. of San Francisco,
San Francisco, Cal.
Pacific Northwest Traction Co.,
Seattle, Wash.
Pennsylvania-Ohio Elec. Co.,
Youngstown, Ohio
Philadelphia Rapid Transit Co.,
Philadelphia, Pa.
Pine Bluff Company,
Pine Bluff, Ark.
Pittsburgh Railways Co.,
Pittsburgh, Pa.
Public Service Railway Co.,
Newark, N. J.
San Francisco-Sacramento R.R.,
Oakland, Cal.
Toronto Transportation Commission,
Toronto, Ontario, Canada
Union Traction Co. of Indiana,
Anderson, Ind.
United Traction Co.,
Albany, N. Y.
York Street Railways,
York, Pa.

HASKELITE MANUFACTURING CORPORATION

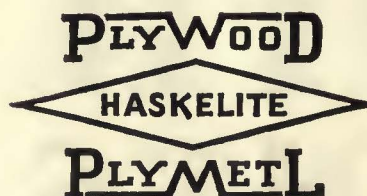
133 West Washington Street, Chicago

Canadian Representatives:

Railway and Power Engineering Corporation, Ltd.
Montreal Toronto Winnipeg



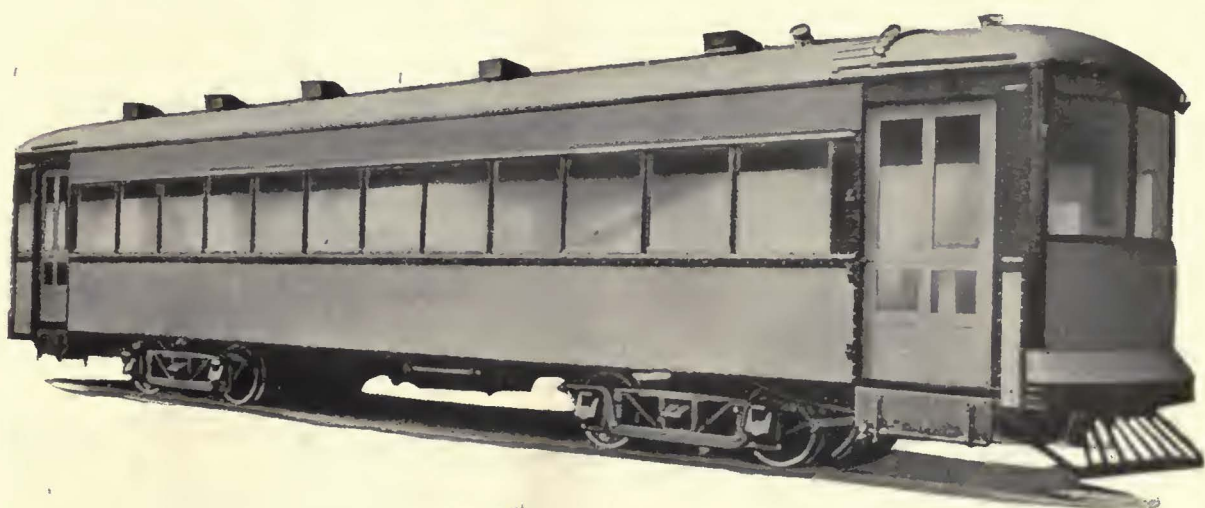
This Montreal Tramway Car was built by the Canadian Car & Foundry Company, Ltd. with PLYMETL side panels.



Mack bus equipped with HASKELITE roof. Operated by Howard Bus Lines. Columbus, Ga.

“Money spent for new cars has been a profitable investment—”

Willits H. Sawyer



It is now a well known fact that modern cars make for greater revenue as well as lowered upkeep. Attractive, comfortable, speedy, they attract more passengers.

Cars of this type built for several of our customers are showing increased net earnings which will pay for themselves in five years or less.

CUMMINGS CAR AND COACH COMPANY

Successors to McGuire Cummings Mfg. Co.

111 W. Monroe Street, CHICAGO

In Detroit, too—

MORE and more experienced buyers of motor coaches and trucks recognize Timken worm-drive as the ideal type of final drive.

Take Detroit, for example—where a vast industrial population spread over a huge fan-shaped area provides a real transportation problem.

There, the city's Department of Street Railways does an amazingly efficient job; and one factor in that efficiency is the newly added fleet of 50 Q. C. F. motor coaches, equipped with Timken Axles—front and rear.



THE TIMKEN-DETROIT AXLE CO.
Detroit, Michigan



TIMKEN AXLES

A.C.F. - HALL-SCOTT



For SEVERE SERVICE

A.C.F.

Where the ability of a motor coach to "carry on" unflinchingly for a long period of time under extreme conditions is a factor, A.C.F. is generally chosen.

The added strength of its chassis, and the ability of the Hall-Scott Engine to keep on turning up the miles month after month and year after year, with a satisfactory economy all the while, have amply justified the faith of transportation men that the American Car and Foundry products would set the pace.

The Public Service Transportation Company has again voiced the faith of the leaders of the industry.

A.C.F. - HALL-SCOTT

65 of the 102

six cylinder Gas-Electric Coaches which the Public Service Transportation Company of New Jersey recently purchased for their heaviest service were A.C.F.

Among the prominent public utility users of A.C.F. built coaches are the following:

New England Transportation Co.	New Haven, Conn.
New Orleans Public Service, Inc.	New Orleans, La.
Morris County Traction Co.	Morristown, N. J.
Washington Rapid Transit Co.	Washington, D. C.
Youngstown & Suburban Transportation Co.	Youngstown, Ohio.
Third Avenue Railway	New York, N. Y.
City of Detroit, Dept. of Street Railways	Detroit, Mich.
Scranton Railway Company	Scranton, Pa.
Miami Beach Railway Co.	Miami, Fla.
Olean, Bradford & Salamanca Rly. Co.	Olean, N. Y.
Boston Elevated Railway Co.	Boston, Mass.
Wisconsin Power & Light Co.	Madison, Wisc.
Shore Line Motor Coach Co.	Gary, Indiana
Midland Utilities Co. of Indiana	Chicago, Ill.
Peoples Motor Coach Co. (D.U.R.)	Detroit, Mich.
Aronimink Transportation Co.	Llanerch, Pa.
Milwaukee Electric Ry. & Light Co.	Milwaukee, Wisc.
Pennsylvania-Ohio Electric Co.	Youngstown, Ohio.
Southern Michigan Transportation Co.	Jackson, Mich.
Central Transportation Co.	Trenton, N. J.
Asheville Power & Light Co.	Asheville, N. C.
Poughkeepsie & Wappinger's Falls Ry. Co.	Poughkeepsie, N. Y.
Wichita Motor Bus Co.	Wichita, Kansas
Chicago, North Shore & Milwaukee R. R. Co.	Chicago, Ill.
Wisconsin Motor Bus Lines	Milwaukee, Wisc.
Aurora, Elgin & Fox River Ry. Co.	Elgin, Ill.
Maine Central R. R. Co.	Portland, Me.
Northern Ohio Power Co.	Akron, Ohio.

American Car and Foundry Motors Company
30 Church Street
New York



No. 211-AE

One of the newest H-K Seats

Among the recent designs brought out by Hale-Kilburn is the No. 211-AE Seat for de luxe suburban, single-end cars. Comfort is the key-note.

It has extra deep, soft spring edge cushions and soft spring back, shaped especially to be form-fitting.

The steel ends have mahogany armrests.

This H-K Seat provides passengers with the easy comfort of their favorite home chair.

*Ask for Bulletins to get full particulars
of the complete line of H-K Seats.*

HALE-KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale-Kilburn Co., 30 Church St., New York
Hale-Kilburn Co., McCormick Bldg., Chicago
E. A. Thornwell, Candler Bldg., Atlanta

Frank F. Bodler, 903 Monadnock Bldg.,
San Francisco
Chris Eccles, 320 S. San Pedro St., Los Angeles
T. C. Coleman & Son, Starks Bldg., Louisville

W. L. Jefferies, Jr., Mutual Bldg., Richmond
W. D. Jenkins, Praetorian Bldg., Dallas, Texas
H. M. Euler, 146 N. Front St., Portland, Oregon

Hale and Kilburn SEATS



The Quick Getaway and the Car-door Engine

WHEN an irate passenger bangs on the door and damns the company up and down, it doesn't soothe his ruffled feelings to tell him that the car door engine is stuck—stuck on account of a trifle.

It's all wrong. It violates one of the cardinal principles of good rail-roading. (Unload fast; load again faster and get away with a snap.)

Nor does it really help to send that car to the shop, only to have it back again, within a short time, for the same reason.

No, the right way is the simple way: Watch the little things. And the little thing on a car door engine which makes trouble is the drying and cracking of the leather cups.

The easy way in this case is to use Texaco Star Grease No. 00, a pure, high quality lubricant that keeps plungers sliding smoothly, leather cups soft and pliable; that helps them do their work to maintain compression.

The whole thing in a nutshell: Live leather—no cracks in the cups; no leaks; good operation of doors; cars kept out of shops.

And so Texaco Star Grease No. 00 helps to maintain "On Time Schedules."

Remember, then, that Texaco Star Grease No. 00 helps car door engines to open and shut—*like that!*

TEXACO Star Grease No. 00

besides being used on car door engines, is also recommended for brake cylinders, controller fingers, motorman's valves, pneumatic and magnetic controls.

It is packed in a 5-lb. handy screw top can, clean and convenient. Also in barrels and half barrels.



THE TEXAS COMPANY
DEPT. R·J· 17 BATTERY PLACE · NEW YORK CITY
HOUSTON · CHICAGO · NEW YORK
OFFICES IN PRINCIPAL CITIES



“STANDARD” STEEL PARTS



MODERN ALL THE WAY THROUGH

The modern car is modern, not in size and appearance only, but in all the hidden vital parts which contribute toward economy and dependability in operation. The specification of “Standard” Steel Wheels, Axles, Armature Shafts and Springs will help you to obtain a car that is modern all the way through.

STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

CHICAGO
ST. LOUIS
NEW YORK

BRANCH OFFICES:
HOUSTON, TEXAS
PORTLAND, ORE.
RICHMOND, VA.

SAN FRANCISCO
ST. PAUL, MINN.
PITTSBURGH, PA.

WORKS: BURNHAM, PA.



Rome Wire--- Moser & Cotins--- CONGRATULATIONS!

The Bok Award for the outstanding industrial advertising campaign of 1926, announced February 15th by the Harvard Jury, goes to the Rome Wire Company of Rome, N. Y. and their advertising agents, Moser & Cotins of Utica, N. Y.

The campaign which won this distinction consisted of a series of process colored inserts which were regularly published in

*ELECTRICAL WORLD	*COAL AGE
*ELECTRICAL WEST	*INDUSTRIAL ENGINEER
*ELECTRICAL MERCHANDISING	JOBBER'S SALESMAN
*ELECTRIC RAILWAY JOURNAL	ELECTRICAL RECORD

This campaign of attractive advertisements made no bid for inquiries but knuckled down to the job of making industry and the electrical trade wire-conscious. Persistently followed up, this campaign has helped lift a basic industrial product out of the more or less nondescript "supply" class and identified it in terms of the buyer's wire requirements. It has established the name "Rome" as a synonym for conductor wire service.

We congratulate Rome and its advertising agents and are pleased that McGraw-Hill Publications were identified with the winners in the preliminary market studies and in the publishing of the resultant campaign.

*—indicates McGraw-Hill Publication

McGRAW-HILL PUBLISHING COMPANY, INC.
Tenth Avenue at 36th Street, New York



Clark Street, Chicago, Between Randolph and Washington, 1887.

Compare This Scene With That of Today!

The calm, leisurely days of a few decades ago! ... No unbroken procession of automobiles, no thundering motor trucks, no hurrying dashing crowds.

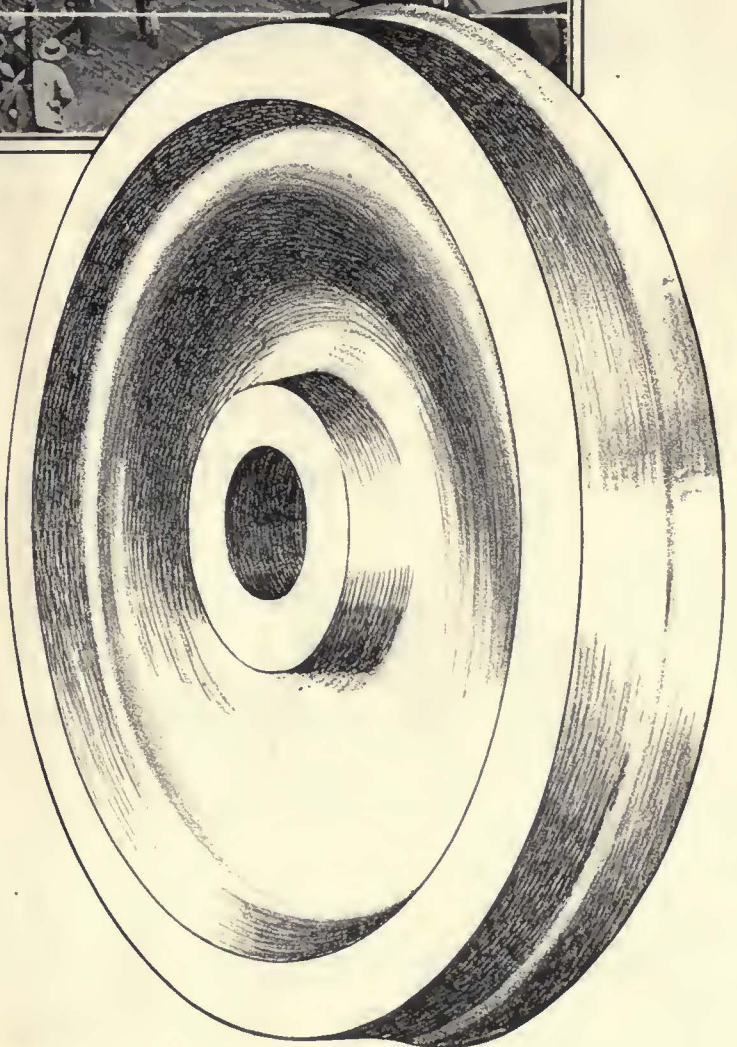
Contrast this scene with that of today: Peak periods, rush hours, stringent schedules: quick starting, sudden stopping, frequent recurrence of emergencies.

Yes, traffic conditions have changed ... and the Gary Wrought Steel Wheel has kept pace with the change.

Our wheel engineers are at your command.

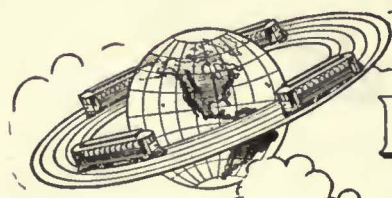
Illinois Steel Company

General Offices:
208 South La Salle Street
Chicago, Illinois



An increasingly large portion of the actual income derived from car card advertising service must be devoted to building and maintaining the prestige of car card advertising in the face of the active competition of all other media.

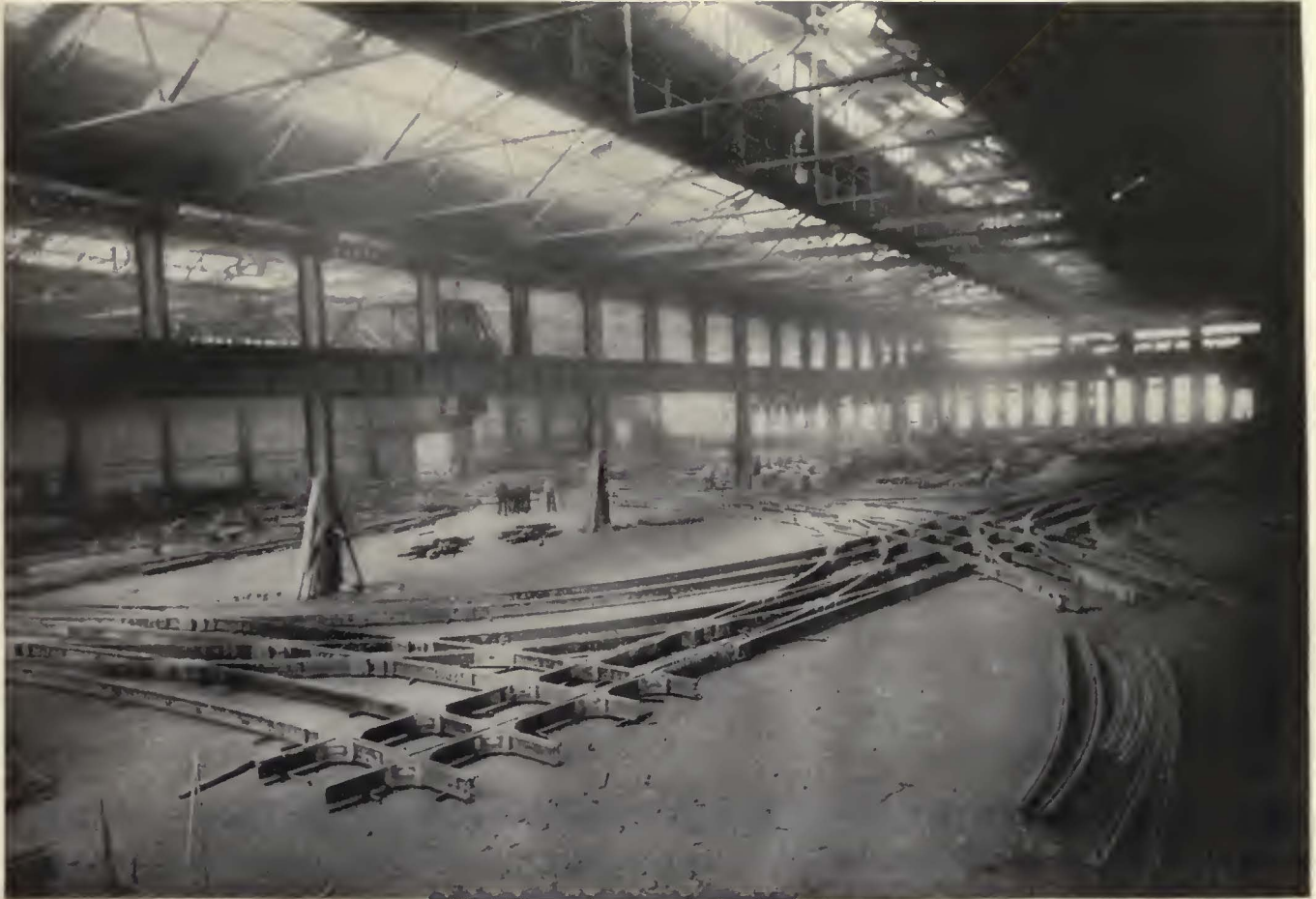
Creating and protecting our mutual interest is a costly item.



Barron G. Collier

INCORPORATED

CANDLER BLDG. NEW YORK



Interior View of One of Bethlehem Track Layout Buildings

Workmanship and Quality

Laying out and fitting of special layouts and trackwork for Electric Railways necessitates extreme accuracy.

All Trackwork is manufactured complete within the Bethlehem organization, thus

permitting control over quality and workmanship. Special work jobs are assembled in large well lighted buildings especially equipped for such work—an exclusive Bethlehem feature.

Condensed List of Railway Equipment

Special Trackwork	Machine Fitted Joints	Tie Rods
Tee Rails	Abbott and Center	Bolts
Girder Rails	Rib Base Plates	Rolled Steel Wheels
Special Splice Bars for Welding	Pole Line Material	Forged Axles

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

DISTRICT OFFICES:

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh Buffalo Cleveland
 Detroit Cincinnati Chicago St. Louis San Francisco Los Angeles Seattle Portland
 Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of Our Commercial Products

BETHLEHEM

Where Safety and Appearance Dominate

IN the heart of a busy city, where safety must be maintained at its maximum, there is nothing so important in the selection of electric line poles as the certainty of their strength and endurance. Another important factor, of course, is their appearance.

Both of these requirements are embodied in the tubular steel pole and reach their maximum effectiveness in "NATIONAL" Poles, because of their great strength and reliability under severe conditions of service and their clean cut, neat appearance which adds to rather than detracts from the built-up surroundings.

Wherever the factors of safety and appearance dominate, it will pay you to specify "NATIONAL" Poles. Made by the largest manufacturer of Tubular Products in the world, with facilities for meeting a wide range of specifications in pole construction.



NATIONAL

NATIONAL TUBE COMPANY

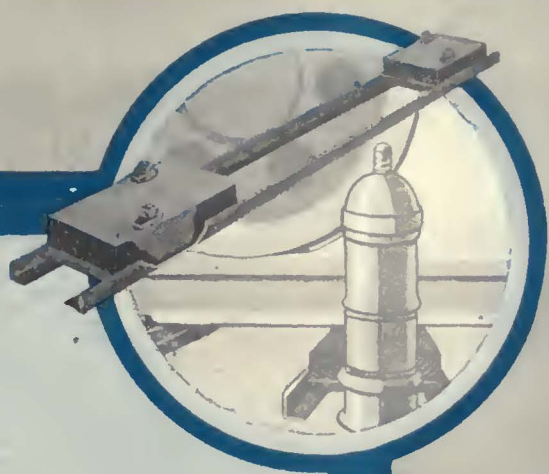
Frick Building, Pittsburgh, Pa.

*They don't buy again
unless they like it —*

80 %
of
**Dayton Customers
Repeat**

*Not Once but
Again and Again*

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**



*Dayton Ties
Put "Shock
Absorbers"
Under Your
Track*



80% of

Dayton Mechanical Tie Customers Re-order

WE MIGHT be safe in saying 95% of Dayton customers repeat, because we have a host of new customers who have not yet had time to repeat.

We've found that, taken over a period of years, an overwhelming majority of properties which have bought Dayton Ties once, do so a second, third, fourth, fifth—as many more times as they need new ties.

No property would or could do this unless Dayton Ties had paid in cold dollars and cents.

And repeat orders are *not* replacements of earlier purchases of Dayton Ties. Since the inception of Dayton Tie Track, 15 years ago, none of it has ever failed or cost a penny of maintenance. It has stood up under the heaviest traffic the street railways have to offer.

Permanently smooth track would take a load off your mind—Dayton Shock Absorber Track will give it to you.

Particulars on request.

**The Dayton Mechanical Tie Co.,
Dayton, Ohio.**

Insures Full Payment for the Service You Render!

FOR USE ON

Electric Railways
Steam Railways
Motor Coaches
Ferries
Excursion Boats
Steamships
Toll Bridges
Ticket Offices
Wherever Fare Protection is needed



THE PASSENGER
PLEASE RETURN TO
ISSUE ONLY FOR ONE
RETRIEVAL PURPOSES
INDICATED BY
FROM TO
FARE CLEAR NUMBER

OHMER
FARE REGISTER
FOR SERVICE
ON ALL RAILWAYS

NO 104 3111 00.65 11 2 2 2

2 RECORDS ALIKE

700	18	4	3	8	0.15	01	0	3	5	217
720	18	4	11	8	0.55	01	0	3	5	217
740	18	4	15	8	0.55	01	0	3	3	217
760	18	4	15	8	0.00	01	0	3	3	217
780	18	4	12	8	0.00	01	0	3	3	217
800	18	4	18	8	0.00	01	0	3	3	217
820	18	4	18	8	0.25	01	0	3	3	217
840	18	4	8	8	0.00	01	0	3	3	217
860	18	4	8	8	0.00	01	0	3	3	217

YOUR schedule may be adequate, your equipment the best, your employees above the average—yet, without rigid, untamperable safeguards thrown around your ticket selling and fare collecting, you are not getting the money due you for

the service you render—a "difference" that may be enough to pay big dividends.

You may now have this protection. You can stop the hidden leaks and losses. You can secure a correct accounting of every ticket sold. You can be sure of all the money due you—or know the reason why.

Unequaled Protection for Tickets Sold and Money Collected

The Ohmer Ticket Printing Register, Type 79, places you in absolute control of the very life blood of your business—the money that is due you from passengers.

It automatically prints tickets as issued—a ticket that is complete in every detail. It also prints on a paper tape inside the register an exact duplicate of the information shown on the ticket. This secret, private, duplicate record is unchangeable and untamperable. Every fare must be properly accounted for—every penny turned in. If a discrepancy exists, it is detected, and responsibility fixed.

Unequaled Protection for Your Profits

Never before have transportation companies been offered the means so effectively and so positively to fortify themselves against mistakes, carelessness, inefficiency, forgetfulness, and dishonesty—weaknesses in old-fashioned methods that are costing untold thousands of dollars today.

This amazing ticket-printing and fare-protecting achievement warrants your fullest investigation. See how much money it would save you—how it would reduce expenses—how it will increase your profits—how it does so much and yet costs so little. Your asking for full information will not obligate you in the least. Write or wire at once.

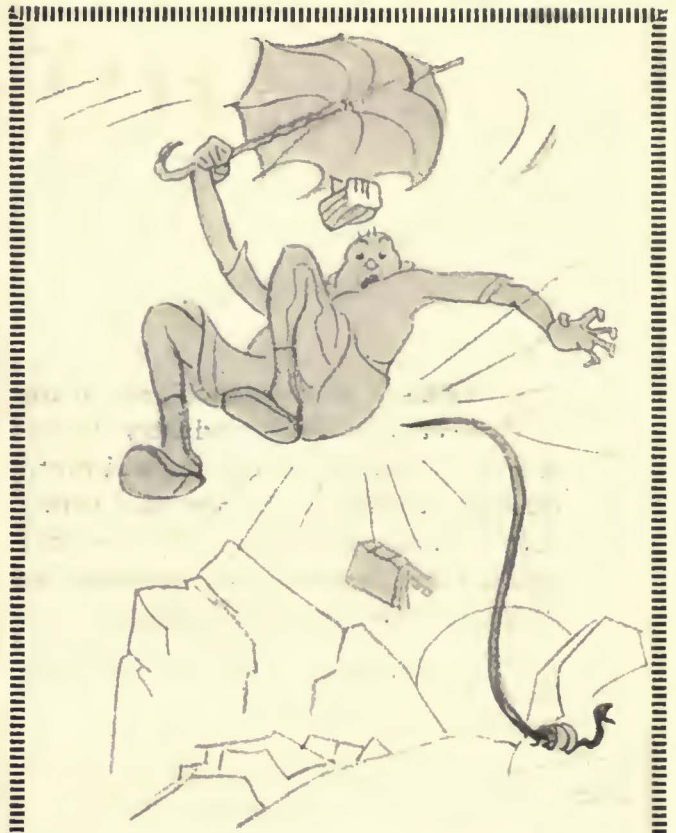
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DAYTON, OHIO

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According to the Gujarati, the snake known as the dhaman can bite with both ends.

One particular end he uses on Sunday only.

In other words, being a pious snake, he shuts down the heavy week-day working end and justifies the working of the other end as an "act of necessity."

Which naturally brings up the subject of shutting down machines on Sunday to true up commutators that have been pitted by misapplied carbon brushes.

Of course the pious operator considers this work proper on Sunday as an "act of necessity" . . . but he's mistaken.

For a prescription of Morganite brushes would free him from misapplication and miscommutation . . . and the need for Sunday work.

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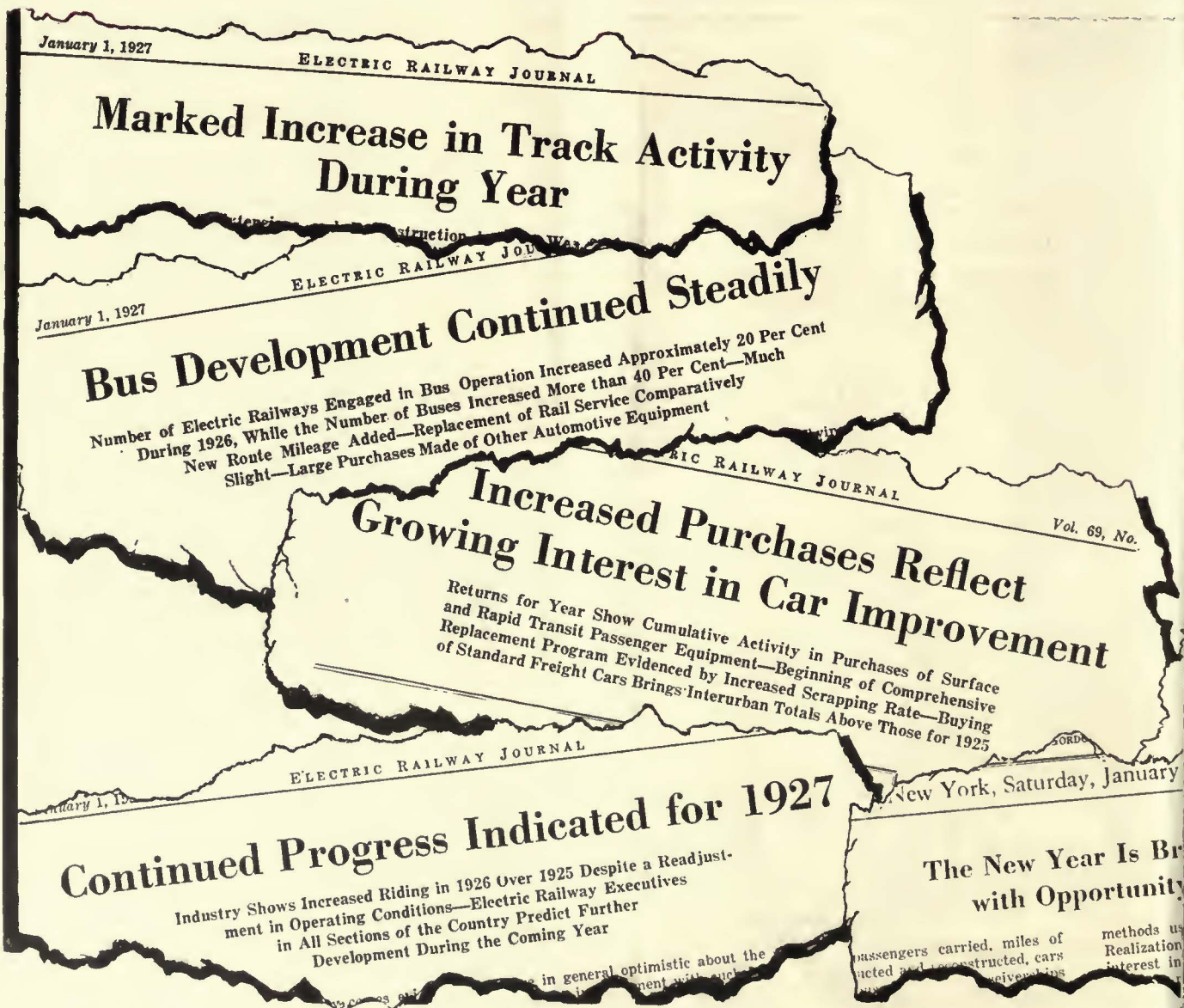
Coming—The most complete Annual

A GREAT maintenance year in the electric railway industry is assured. With the economies and profit making possibilities of new cars firmly established, operators all over the country are turning their attention to "Maintenance for the Car Rider."

The appearance of the car, its clean-

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Millions of dollars will be spent this year for shops, for machines, tools and maintenance equipment and supplies.



Maintenance Number

Ever published by Electric Railway Journal

ELECTRIC railway men are looking eagerly for equipment to increase efficiency, they are seeking tools and devices which make transportation service more attractive, they are intensely interested in equipment that will help them render modern transportation service.

They will look for the latest information on the whole range of maintenance work in the Annual Maintenance Number of *Electric Railway Journal*.

For more than a generation this issue has been a handbook of maintenance fact. This year's issue will contain the greatest gathering of vital

information under one cover on this important subject ever published.

The editorial pages will focus attention on the most modern practices in shop construction and operation, on the most effective policies of track construction and on the most reliable methods of line maintenance.

The advertising pages will focus attention on the leading devices, tools, machines and equipment needed in modern maintenance work.

An entire industry needs and wants manufacturers' assistance. Tell them through an issue that reaches the industry when plans are being considered.

Last forms close March 14

Wire your reservation

**ANNUAL
MAINTENANCE NUMBER**

March 19, 1927

ELECTRIC RAILWAY JOURNAL

**30,000 Estimated for Equipment
and Supplies in 1927**

ntiality of the Electric Railways Indicated in Forecast of Purchases
Maintenance and New Equipment for Coming Year—An Increase of
Per Cent Over 1926 Is Based on Extensive Survey—New Cars and
Are Featured, While Bus Expansion Is on Slightly Lower Scale

Whatever your requirements

specify

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Brushes

They talk for themselves

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Chicago Office: 1657 Monadnock Block
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Canadian Distributors: Lyman Tube & Supply Co., Ltd.
Montreal and Toronto



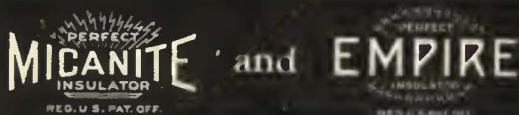
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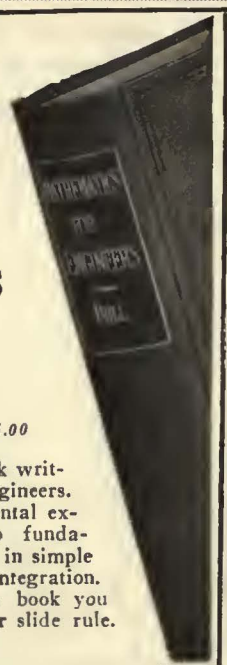
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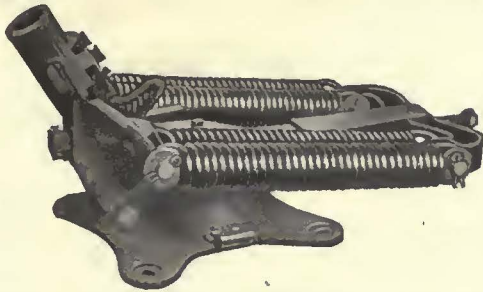
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You doubtless could if you knew what grade of metal to put in the foot, the swivel, the pole socket, etc.—if you knew where they had to be reinforced to withstand strains and where they had to be lightened to keep down weight; if you knew a reliable foundry that could furnish suitable castings; if you had \$60,000 worth of special machinery, tools, jigs, reamers, drills, etc., but even so, if you didn't have 35 years of experience and a crew of skilled mechanics you couldn't equal a Nuttall Trolley. So why should you think anyone else could?

Why should you buy just trolley poles, trolley harps, trolley wheels? If they cost less than Nuttall's its poor economy anyhow because they are worth less. And it is worth something more to get with your purchase the feeling of confidence inspired by a product you know is right.

Buy genuine Nuttall Trolley parts, poles, wheels, harps, from Nuttall.

R.D. NUTTALL COMPANY
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Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

- No-wear Check Pawl
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—are no longer operating problems. We can show you how to take care of both with one equipment. The Peter Smith Forced Ventilation Hot Air Heater will save, in addition, 40% to 60% of the cost of any other car heating and ventilating system. Write for details.

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Genuine Barrett Jacks for every purpose
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There is no substitute for Pantasote

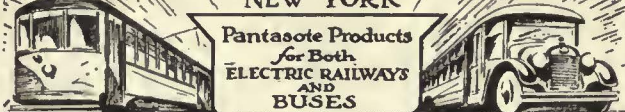
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The only homogeneous panel board

*standard
for electric railway cars
and motor buses*

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At 46th, 250 Park Avenue Street
NEW YORK



People's Gas Bldg., Chicago, Ill.



R 11 Double Register

Both our latest single and double registers are now equipped for electric as well as mechanical hand or foot operation.

Full Electric Operation of Fare Registers

A completely satisfactory fare registration system is one that has the confidence of the public, the conductor and the accounting department. The simplicity and accuracy of International Registers maintained for more than thirty years, is combined in the later types with the extra speed and convenience of electric operation.

The International Register Co.
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Tribloc Chain Hoists equipped with our "Ezejoin" Shackle



This improvement ends the possibility of poor welds when renewing the load chains in Ford Triblocs.

Any handy man can take out the old load chain and replace it with a new one in a few minutes.

The Tribloc Hoist has spur gears; the highest efficiency, which is 80%. Made of malleable iron and drop-forged steel parts throughout.

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Lowest Cost
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Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.
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Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.
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CORPORATION, manufacturing trucks, buses, desires services capable men engineering, sales, service. State age, education, previous employment, experience, also furnish references. P-978, Electric Railway Journal, Tenth Ave. at 36th St., New York.

ROAD MASTER wanted on Middlewest street railway property; young man with track experience; engineer preferred, to handle division one hundred miles of city track. In answer please give full experience and salary expected. P-971, Electric Railway Journal, Bell Tel. Bldg., St. Louis, Mo.

TRACK foreman, experienced in street railway track and paving work. One who can take full charge of track department for small company. Give age, experience, references and salary expected in first letter. P-975, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

POSITIONS WANTED

EQUIPMENT engineer and maintenance executive, six years' factory engineering experience and seven years' maintenance work with large railway company, desires change. College graduate with A-I references. PW-967, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

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MASTER mechanic with 15 years' experience city and interurban cars, buses, automobiles and building maintenance. Electrical engineering graduate. PW-974, Electric Railway Journal, Tenth Ave. at 36th St., New York.

OPERATING official available. Broad experience, fine record of achievements, city and interurban properties, East and Central West. Recognized ability, successful in handling labor, public relations, selling transportation, increasing revenues, accident prevention, solving traffic problems. Progressive, efficient and a worker for results. Fine references. Correspondence and appointments for personal interview invited. PW-977, Electric Railway Journal, Guardian Bldg., Cleveland, Ohio.

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**Economy—Service
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If there is anything you want—

or something you don't want that *other* readers of this paper can supply—
or use—advertise in the



Somebody is always looking for something to meet certain business needs. Some men in charge of plant operations may be in the market for good used equipment—others may have just what they want, to sell. Some may require a man of unusual quali-

- Agencies Wanted
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fications for a particular position—that man may be another reader of this paper!

Put the Searchlight Section to work for you under any of the following classifications—to fill your business needs.

- Miscellaneous Wants
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- Partners Wanted
- Patents For Sale
- Patent Attorneys
- Plants For Sale
- Positions Vacant

- Positions Wanted
- Property For Sale
- Receivers' Sales
- Representatives Wanted
- Salesmen Wanted
- Work Wanted
- Etc., Etc., Etc.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Westinghouse Air Brake Co.

Anchors, Gny
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Armature Shop Tools
Columbia Machine Works
Elec. Service Supplies Co.

Anatomic Return Switch
Standa
Ramapo Ajax Corp.

Automatic Safety Switch
Standa
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Cincinnati Car Co.
Illinois Steel Co.
Standard Steel Works Co.
Westinghouse E. & M. Co.

Axles (Front and Rear)
Motor Truck and Passenger Car
Timken-Detroit Axle Co., The

Axles, Steel
Carnegie Steel Co.

Axle, Trailer & Motor Bus
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Bearings and Bearing Metals
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Works
General Electric Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller
Side
Columbia Machine Works
Stucki Co., A.

Bearings, Roller
Timken Roller Bearing Co.

Bells and Buzzers
Consolidated Car Heating Co.

Bells and Gongs
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Cincinnati Car Co.
Columbia Machine Works
Elec. Service Supplies Co.

Benders, Ball
Railway Track-work Co.

Bodies, Bus
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Cummings Car & Coach Co.
Graham Brothers

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Haskellite Mfg. Corp.

Boilers
Babcock & Wilcox Co.

Boiler Tubes
National Tube Co.

Bolts and Nuts, Track
Illinois Steel Co.

Bond Testers
American Steel & Wire Co.
Electric Service Supplies Co.

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Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Bonds, Rail
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Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co., Inc.

Braces, Timber
Duff Mfg. Co.

Braces, Trench
Duff Mfg. Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)
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Columbia Machine Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Cincinnati Car Co.

National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

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American Brake Shoe & Foundry Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
Cincinnati Car Co.
Columbia Machine Co.
General Electric Co.
National Brake Co.
Westinghouse Tr. Br. Co.

Brakes, Magnetic Rail
Cincinnati Car Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbons Co.
Morganite Brush Co.
Westinghouse E. & M. Co.

Brushes, Graphite
Morganite Brush Co.

Brushholders
Columbia Machine Works

Buildings Steel
American Bridge Co.

Bulkheads
Haskellite Mfg. Corp.

Bankers, Coal
American Bridge Co.

Buses
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Cummings Car Coach Co.
Graham Brothers
International Motor Corp.
Mack Truck, Inc.
Studebaker Corp. of Amer.
Yellow Truck & Coach Co.

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Brill Co., The J. G.
Bemis Car Truck Co.
Cincinnati Car Co.
Columbia Machine Works

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Irvington Varnish & Ins. Co.

Cambric Yellow and Black Varnish
Mica Insulator Co.

Carbon Brushes (See Brushes, Carbon)

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Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Steps, Safety
Cincinnati Car Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co., Inc.

Cars, Gas-Electric
Brill Co., The J. G.
General Electric Co.
Westinghouse E. & M. Co.

Cars, Gas, Rail
Brill Co., The J. G.

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Brill Co., The J. G.
Cincinnati Car Co.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
Wason Mfg. Co.

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Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Brass Composition or Copper
Cincinnati Car Co.
Columbia Machine Works

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
Bemis Car Truck Co.
Columbia Machine Works
Standard Steel Works Co.

Castings, Malleable & Brass
Bemis Car Truck Co.
Columbia Machine Works

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Earl, C. I.
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Ohio Brass Co.
Wood Co., Chas. N.

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Archbold-Brady Co.

Celling Car
Haskellite Mfg. Corp.
Pantaso Co., Inc.

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Haskellite Mfg. Corp.

Cement
N. Amer. Cement Corp.

Cement Accelerator
N. Amer. Cement Corp.

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Heywood-Wakefield Co.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.
Illinois Motive Equipment Co.

Changas Trays
Cincinnati Car Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & M. Co.

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Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Cincinnati Car Co.
Ohio Brass Co.

Clusters and Sockets
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Clinches
Long Mfg. Co.

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Elec. Service Supplies Co.
Westinghouse Elec. & M. Co.

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Columbia Machine Works
Economy Electric Devices Co.
General Electric Co.
Westinghouse E. & M. Co.

Colls, Choke and Kicking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.

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Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

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Westinghouse E. & M. Co.
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General Electric Co.
Westinghouse E. & M. Co.

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General Electric Co.
Westinghouse Tr. Br. Co.

Condensers
General Electric Co.
Westinghouse E. & M. Co.

Condenser Papers
Irvington Varnish & Ins. Co.

Connectors, Solderless
Westinghouse E. & M. Co.

Connectors, Trailer Car
Columbia Machine Works
Consolidated Car Heat. Co.
Elec. Service Supplies Co.
Ohio Brass Co.

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General Electric Co.
Westinghouse E. & M. Co.

Controller Regulators
Elec. Service Supplies Co.

Controlling Systems
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Westinghouse E. & M. Co.

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American Steel & Wire Co.
Anaconda Copper Mining Co.

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American Brass Co., The
American Steel & Wire Co.
Anaconda Copper Mining Co.

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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.
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American Steel Foundries
Brill Co., The J. G.
Cincinnati Car Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Crawls, Hoists & Lifts
Buda Co., The
Electric Service Supplies Co.

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Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Foundations
International Steel Tia Co.

Crossings, Frog and Switch
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Signals. (See Signal Systems, Highway Crossing)

Crossings, Track (See Track, Special Work)

Crossings, Trolley
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Westinghouse E. & M. Co.

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Pantaso Co., Inc.

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Elec. Equipment Co.
Hyman-Michaels Co.
Van Loan Corp., Irving S.

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Ramapo Ajax Corp.

Destination Signs
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Elec. Service Supplies Co.

Detective Service
Wish Service, Edward P.

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Cincinnati Car Co.
Consolidated Car Heat. Co.
National Pneumatic Co.

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Cincinnati Car Co.
General Electric Co.
Hale-Kilburn Co.

Doors, Folding Vestibule
National Pneumatic Co.

Drills, Track
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Dryers, Sand
Elec. Service Supplies Co.

Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

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Columbia Machine Works
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

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Railway Track-work Co.

Electric Rivet Heaters
American Car & Foundry Co.

Electric Transmission Towers
American Bridge Co.

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Amer. Steel & Wire Co.
John A. Roebbling's Sons Co.

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Railway Track-work Co.
Una Welding & Bonding Co.

Electrodes, Steel
Railway Track-work Co.
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Duce, E. I. Du Pont de Nemours Co.

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Bylesby & Co., H. M.
Day & Zimmermann, Inc.
A. L. Drum & Co.
Ford, Bacon & Davis
Hemphill & Wells
Heist, Engelhardt W.
Jackson, Walter
Kelser & DeLew
Lion & Marshall Co.
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood
Stone & Webster
White Eng. Corp., The J. G.

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Westinghouse E. & M. Co.

Engines, Gasoline
Continental Motors Co.

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Economy Electric Devices Co.
Illinois Motive Equipment Co.
Ohmer Fare Register Co.
Perey Mfg. Co.

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Elec. Service Supplies Co.
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Consolidated Car Fender Co.
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Wood Co., Chas. N.

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Elec. Service Supplies Co.

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Floors
Haskellite Mfg. Corp.

Forgings
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Cincinnati Car Co.
Duff Mfg. Co.
Standard Steel Works Co.

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Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Frogs, Track (See Track Work)

Frogs, Trolley
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American Bridge Co.

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General Electric Co.
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General Electric Co.

(Continued on page 64)

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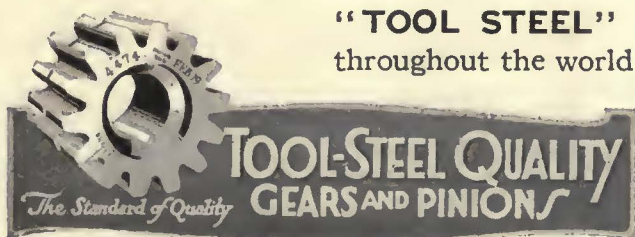
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Railway Track-work Co.
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- Jacks, Pipe Forcing**
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Dixon Crucible Co., Joseph
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Irvington Varnish & Ins. Co.
- Paints and Varnishes, Railway**
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- Paving Guards, Steel**
Godwin Co., Inc., W. S.
- Pickups, Trolley Wire**
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Ohio Brass Co.
- Pinion Pullers**
Duff Mfg. Co.
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General Electric Co.
Wood Co., Chas. N.
- Pinions (See Gears)**
- Pine, Case Hardened, Wood and Iron**
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Ohio Brass Co.
Westinghouse Tr. Brake Co.
- Pipe**
National Tube Co.
- Pipe Fittings**
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Westinghouse Tr. Brake Co.
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Ohio Brass Co.
- Pole Reinforcing**
Hubbard & Co.
- Poles, Metal Street**
Elec. Ry. Equipment Co.
Hubbard & Co.
- Poles, Ties, Posts, Piling & Lumber**
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Naughte Pole & Tie Co.
- Poles, Trolley**
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Nuttall Co., R. D.
- Poles, Tubular Steel**
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
National Tube Co.
- Portable Grinders**
Buda Co., The
- Potheads**
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Okonite-Callender Cable Co. Inc.
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American Bridge Co.
- Power Saving Devices**
Economy Electric Devices Co.
- Power National Ry. Appliance Co.**
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Cincinnati Car Co.
- Pressure Regulators**
General Electric Co.
Ohio Brass Co.
- Westinghouse E. & M. Co.**
Westinghouse Tr. Brake Co.
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International Register Co.
Wood Co., Chas. N.
- Pyroxylin**
Duco, E. I. Du Pont de Nemours Co.
- Radiators**
Long Mfg. Co.
- Rail Braces & Fastenings**
Ramapo Ajax Corp.
- Rail Filler**
Carey Co., Philip
- Rail Grinders (See Grinders)**
- Rail Joints**
Carnegie Steel Co.
Illinois Steel Co.
- Rail Joints, Welded**
Lorain Steel Co.
Metal & Thermit Corp.
- Rail Welding**
Metal & Thermit Corp.
Railway Track-work Co.
Una Welding & Bonding Co.
- Rails, Steel**
Carnegie Steel Co.
Electric Equipment Co.
Illinois Steel Co.
- Railway Safety Switches**
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.
- Railway Welding (See Welding Processes)**
- Rattan**
Brill Co., The J. G.
Cummings Car & Coach Co.
Elec. Service Supplies Co.
Hale-Kilburn Co.
- Rattan Car Seat Webbing**
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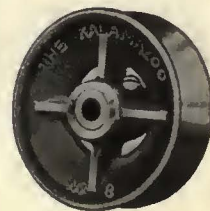
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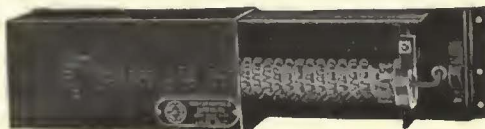
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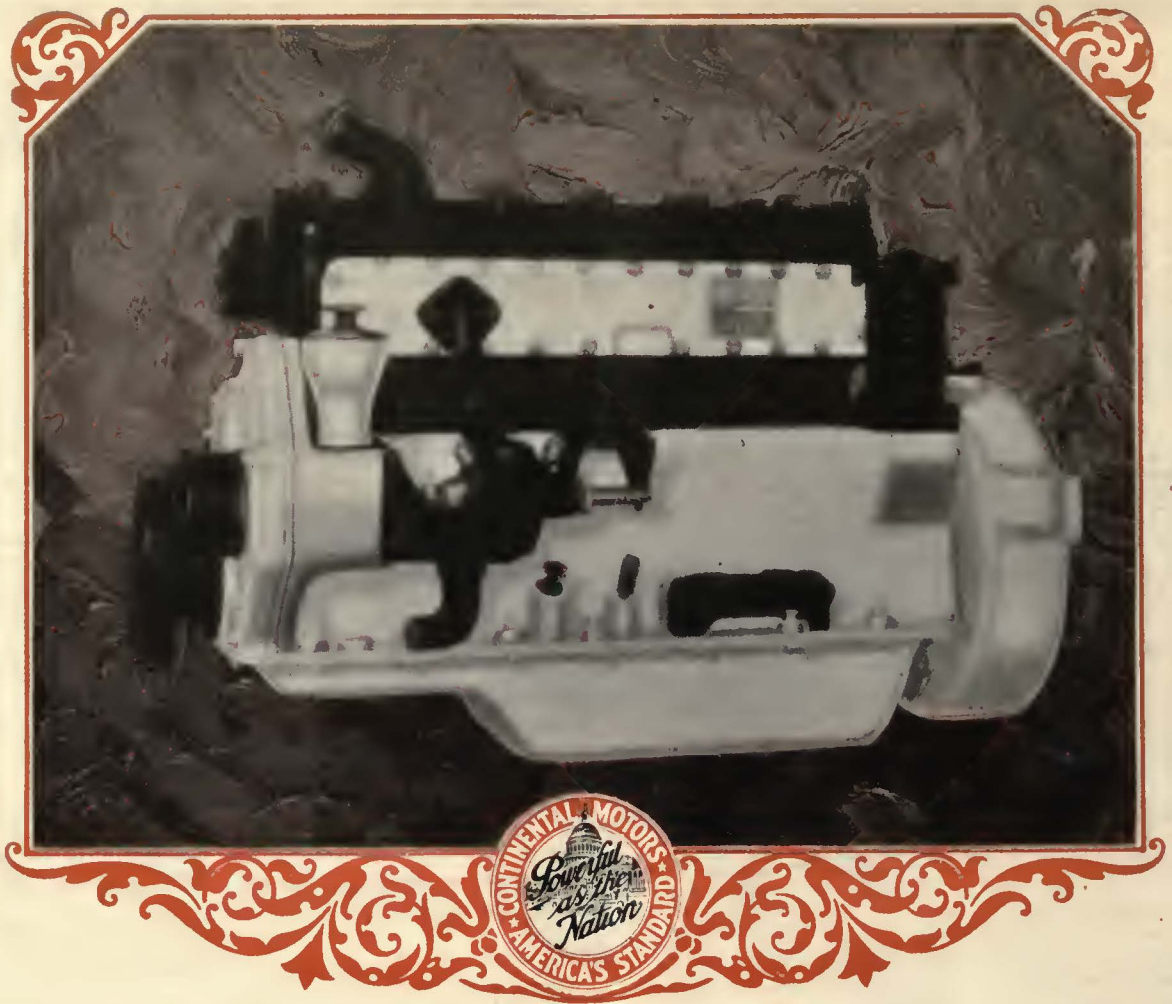
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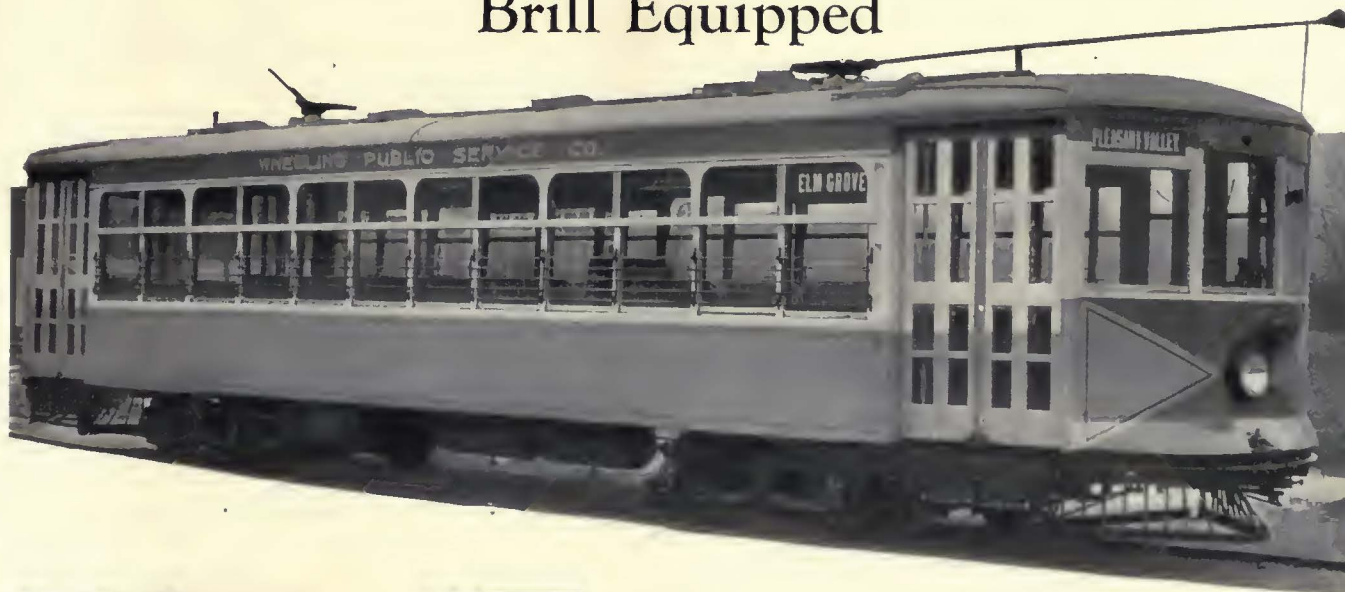
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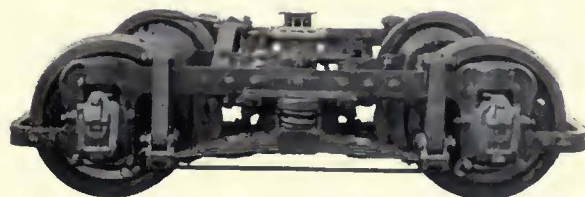
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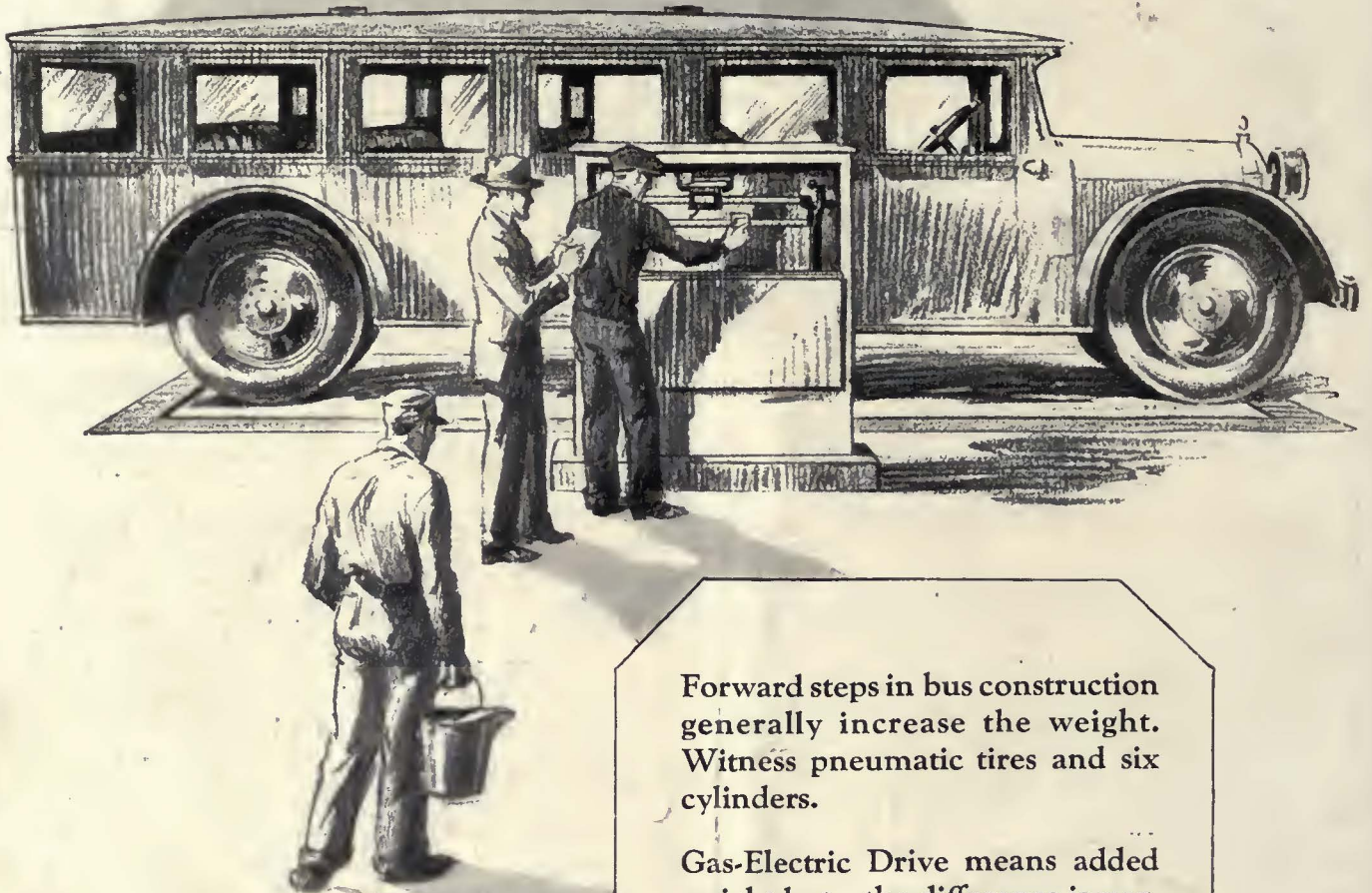
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