Annual Statistical Number

ELECTRIC RAILWAY JOURNAL

McGraw-Hill Company, Inc. January 3, 1925 Twenty Cents Per Copy

Contributions to Electrification
During 1924

Norfolk & Western Railway.

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Pennsylvania Railroad

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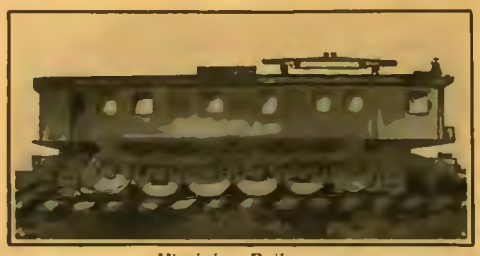
New York, New Haven & Hartford R. R.

179-ton, 2508 hp., A-C. Passenger Locomotive. To maintain 100% electric service, between New York and New Haven, the N. Y., N. H. & H. R. R. received during 1924 twelve high-speed passenger locomotives. Further extensions to their electrified zone are under way.

Long Island Railroad

54.5-ton, 430 hp., Multiple-Unit Cars. In order to more efficiently handle New York's heavy suburban traffic, The Long Island R. R. is extending its electrification to Babylon, L. I., a distance of approximately twenty miles. Forty additional multiple-unit equipments are on order.



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

Westinghouse

X 78474

Vol. 65, *No.* 1 New York, January 3, 1925 *Pages* 1 *to* 48

ELECTRIC RAILWAY JOURNAL

CONTENTS

JANUARY 3, 1925

McGraw-Hill Company, Inc., Tenth Ave. at 36th St., New York

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Number of Copies Printed, 6,600. Advertising Index—Alphabetical, 130; Classified, 124, 126, 128; Searchlight Section, 123

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HARRY L. BROWN, *Editor*

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Modernizing and Merchandizing

With Westinghouse Modernized Equipment

In Cleveland

In Brooklyn

In Pittsburgh

Designed For a Service

The tendency of the times is to modernize with equipment designed for a specific service. Heavy urban mass transportation, moderate city transportation, high speed interurban transportation and freight haulage all require characteristics which must be ***built in the equipment.***

Westinghouse Engineers have made a study of the requirements of various types of service and are prepared to furnish ***equipment for every transportation need.***

In Wheeling

In Baltimore

In Los Angeles

In Los Angeles

In Houston

In Presque Isle, Me.

In Boston

In Springfield, Vt.

In New Orleans

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

Westinghouse

X 78701

More Statistics:

During 1924 the Coffin Medal was won by a road that attributes part of its success to effective rail welding and track grinding with equipment shown here.

The most successful roads everywhere relied on this equipment.

The "Ajax" Arc Welder definitely maintained its superiority.

The "Vulcan" Rail Grinder made its appearance.

The "Imperia" Track Grinder was introduced.

The "Reciprocating" Grinder added new laurels for removing corrugations.

The "Midget" Rail Grinder joined our family.

The Railway Track-work line became broad enough to cover every track grinding and welding requirement.

Railway Track-work Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:
Chester F. Gallor, 30 Church St., New York
Chas. N. Wood Co., Boston
Electrical Engineering & Mfg. Co., Pittsburgh
Atlas Railway Supply Co., Chicago
Equipment & Engineering Co., London

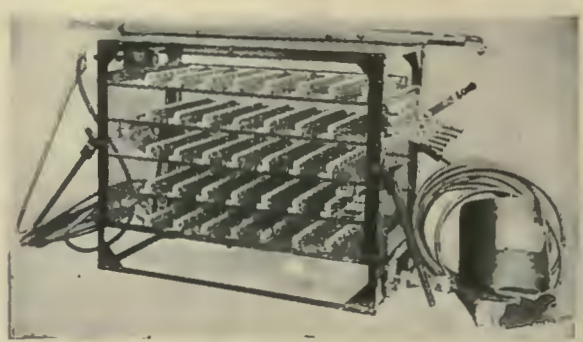
(365)

"Reciprocating" Track Grinder

"Vulcan" Rail Joint Grinder

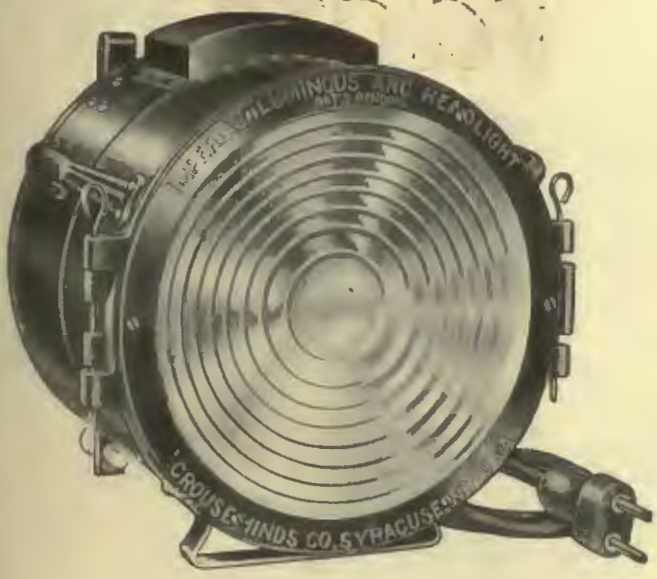
"Atlas" Rail Grinder

"Imperia" Swing Frame Rail Grinder



"Ajax" Electric Arc Welder

Imperial Headlights



Luminous Arc for Interurbans

Type LAA

Incandescent for Interurbans

Type DCP

These two Imperial Headlights offer the maximum in track illumination — one from the luminous arc, the other from the incandescent bulb. For high speed interurban service they are ideal.

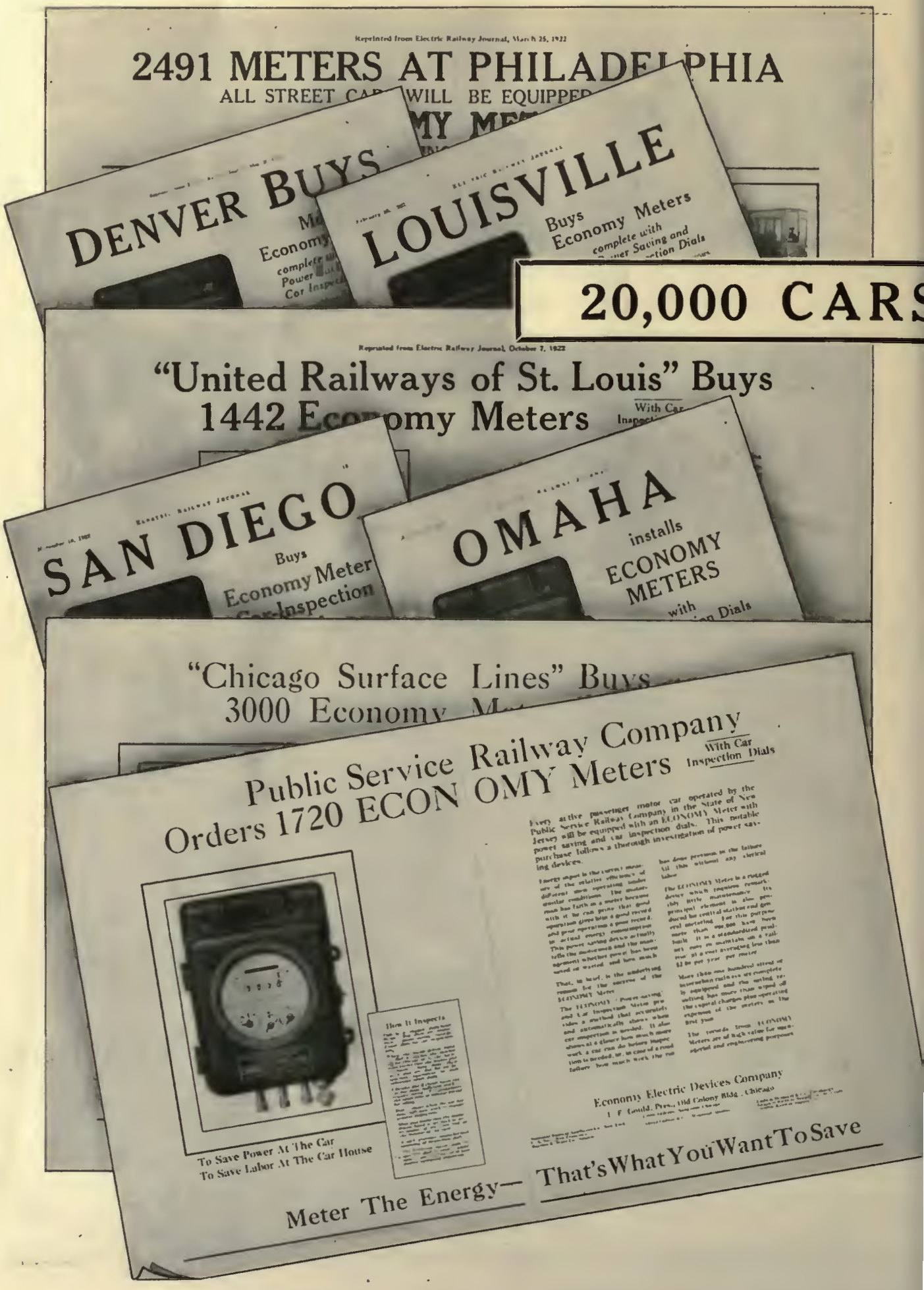
The Ohio Brass Co.
Mansfield, Ohio

B PRODUCTS

The INTERNATIONAL STEEL TIE COMPANY
CLEVELAND

Steel Twin Tie Track

Renewable Track · · Permanent Foundation


Reprinted from Electric Railway Journal, March 25, 1922
2491 METERS AT PHILADELPHIA
ALL STREET CAR WILL BE EQUIPPED
DENVER BUYS
LOUISVILLE
Buys
Economy Meters
20,000 CARS
Reprinted from Electric Railway Journal, October 7, 1922
"United Railways of St. Louis" Buys
1442 Economy Meters
With Car
SAN DIEGO
Buys
Economy Meter
OMAHA
installs
ECONOMY
METERS
"Chicago Surface Lines" Buys
3000 Economy
Public Service Railway Company
Orders 1720 ECONOMY Meters
With Car
Inspection Dials
To Save Power At The Car
To Save Labor At The Car House
Economy Electric Devices Company
Meter The Energy— That's What You Want To Save

ransfer point —

buses build up goodwill as well as revenue!

Children hurrying home from school;—tired men and women on their way from business!

It isn't hard to figure the goodwill value of Mack Bus service that will give them the convenience of quick easy transfer at junction points or at the end of the line.

Electric railways have already proved the value of the Mack Bus as a feeder and extension service to existing car lines. They have found the necessary combination of attractive appearance, comfort and practical roadworthiness in Mack Bus design,—all bus from bumper to tail light.

And they have found the vital factors of dependability, low maintenance and low depreciation in these exclusive Mack features—

The sturdy long-life Mack engine.

A specially designed low bus chassis.

Wide tread, assuring safety and permitting a short turning radius.

The Mack dual reduction drive axle especially designed to give maximum road and under-body clearance.

The Mack transmission with ground gears.

Dual system of brakes on wheels and drive shaft.

Mack Shock Insulator. (All spring ends are embedded in rubber shock insulator cushions, eliminating metallic contact between springs and frame, absorbing vibrations, affording yielding support to springs and banishing shackle wear and lubrication.)

MACK TRUCKS, INC.
INTERNATIONAL MOTOR COMPANY
25 BROADWAY NEW YORK CITY

Eighty-three direct MACK factory branches operate under the titles of: "MACK MOTOR TRUCK COMPANY" and "MACK-INTERNATIONAL MOTOR TRUCK CORPORATION."

The Mack Bus

25 Passenger, City Type

Performance counts!

New light on the wire wear question

Taking as a basis the standard practice in trolley wire removal, of one of the largest electric railway companies, the accompanying tabulation gives the results of a study of the relation between wear and renewal point for hard drawn copper and Phono-Electric Trolley Wire.

Note that high tensile Phono-Electric, apart from its proved ability to outlast hard drawn copper three to four times, can safely be used until its area has been reduced 15% below the limit for copper—meaning a further additional 45% wear.

Alternatively the greater tensile strength of Phono-Electric can be used for increased span between supports at a consequent saving in line installation.

Either way Phono-Electric economies are tangible

Relation between breaking strength and wear for 2/0 Phono-Electric and 2/0 Hard Drawn Copper

	COPPER		PHONO-ELECTRIC	
	B.S. lb.	Condition	B.S. lb.	Condition
V.D.—364.8 mils Area—.1046 sq.in.	5520	New	8200	New
V.D.—300 mils Area—.08108	4280	Good	6360	Above new copper
V.D.—275 mils Area—.07214	3810	Fair	5650	Still above new copper
V.D.—250 mils Area—.0633	3340	Dangerous	4960	Above good for copper
V.D.—200 mils Area—.0466	2460	must come down	3650	Dangerous
V.D.—.150 Area—.0311	1640	Down	2435	Must come down

"Bridgeport" Brass Trade Mark Co.
Phono-Electric
Members of the Copper and Brass Research Association.

Bridgeport Brass Company
Bridgeport Connecticut

It's 1925—the time to standardize your bus equipment!

WHILE others experiment—test out—and feel their way along with changing models and different styles of buses, you can standardize at once.

The Fifth Avenue Type L Bus is essentially the same design and construction now as the first one was four years ago. Improvements? Yes, of course! But no radical changes are made, no altered models are developed from year to year to create an artificial stimulation for sales.

One standard type of bus, one standard stock of interchangeable unit parts from engine to rear end, one single standard method of maintenance—these are the long-established qualifications of Fifth Avenue Buses, which appeal most strongly to electric railway managements. Our own bus operating experience of fifteen years has dictated this policy.

NEW YORK TRANSPORTATION CO.
New York, N.Y.

Type L
FIFTH AVENUE BUSES

Capacity:
Seats 55 passengers in comfort, twice the load of the ordinary single-deck bus.

All-weather tops:
A practical feature which makes the upper deck an open-air rider's paradise, in summer, and a comfortable, sheltered car in winter.

Overall-height:
Less than 14-feet clearance required with top in place.

Interurban train on the Ephrata Lebanon

Interurbans—

Pacific-Northwest Traction Co.

Dozens of fine high-speed roads have been using Miller Trolley Shoes for many years

Over eight years ago, the pioneer Miller Trolley Shoe installation was the Portland-Lewiston Interurban, still a firm believer in this sliding contact equipment. Their records of wire wear over this long period conclusively demonstrate the superior economy of sliding contact.

The Interstate Public Service, the Hudson Valley, Pacific Northwest Traction, Waterloo Cedar Falls Northern—these are but a few of the other leading long-time users.

On this class of railway—ability to cling to the wire at high speeds with less trolley tension, is the outstanding advantage which leads to the choice of Miller Trolley Shoes.

Your New Year Resolution

Miller Trolley Sho

Street Scene in the City of Fort Worth, Texas

and city cars!

Now city roads, including the 1924 Coffin Medal Winner, find them most satisfactory

For the second consecutive time, the Coffin Medal Prize went to a Miller Shoe equipped road last year. And this road, the Northern Texas Traction Co., uses Shoes on all its cars—city cars—interurbans. By exclusive use of Trolley Shoes throughout, thus avoiding intermingling of shoes and wheels on the same line, they have cut trolley troubles and trolley costs immensely.

Where one-man cars are generally used, a trolley which stays on the wire at curves and busy intersections, and on railroad crossings also, is a tremendous advantage.

One-man Safety Car of Northern Texas Traction Co.

More mileage — better contact — less cost

"Modernize Trolley Contact"

MILLER TROLLEY SHOES
(Patented)

"Less Wire Wear"

o.-Boston-21, Mass.

734,212 Mile

A good pinion kept "good" by proper lubrication!

WHEN this veteran pinion came back to the New York, Westchester & Boston Railway Company, after being exhibited at Atlantic City, the store-room employees had difficulty in distinguishing it from a new one.

That's how little wear it showed!

And now it's going back on *one of the new cars,* ready for many years more of useful life.

Throughout twelve long years of high-speed, high acceleration service, express and local, on this road, Galena Lubricants have been the bulwark of defence against wear. And that's the record Galena Lubricants have written throughout the steam and electric railway maintenance field.

The reason is well-known to the majority of railway master mechanics. They know that Galena means "prime lubricants," not by-products, and they know that Galena also means a bona-fide mechanical and lubrication *service* which is measured by results like the example illustrated above. Such results show chiefly in the reduced maintenance account.

Galena-Signal Oil Company

New York - Franklin, Pa. - Chicago

and offices in principal cities

Since 1912 and Good as New Today

Here's the Equipment Data!

1. Nuttall B. P. Pinion No. 237.
2. N. Y., Westchester & Boston Ry.
3. In Service About 12 Years.
4. Total Mileage 734,212.
5. 2—West, No. 409 B (175 hp.) Motors.
6. Speed—55 m.p.h.
7. Acceleration 1½ m.p.h.p.s.
8. Braking 2½ m.p.h.p.

1924-ENGINEERING

THERE is romance in the continual progress of the electrical industry. To laymen it is a fascinating story. To men in the industry it is an intensely interesting subject of study—and a profitable one. Careful study of recent developments reveals not only the progress made during the year but its vast promise for the future.

This Annual Statistical Number of the *Electric Railway Journal* is a constructive review of 1924 activities in the electric railway business, and an inspiring survey of the possibilities for progress during 1925—a valuable source of information for everyone connected with the industry.

For those especially interested in this subject, *"Engineering Developments in 1924"*, an intimate report of General Electric progress in the manufacture and application of electrical products is published in the January issue of *The General Electric Review*. It is thorough and comprehensive, but too long for republication here. A digest of it is given on the opposite page. Turn to your copy of the *Review* for the article in full, or if you haven't one at hand, write today for a copy of this issue, addressing *The General Electric Review*, Schenectady, N. Y.

DEVELOPMENTS-1924

Progress in the manufacture of these products and their application to industry is described in *Engineering Developments in 1924*, in the January *General Electric Review*.

Generation

Turbines—First unit for operation with 1200 lb. steam pressure installed; large high speed turbines constructed.

Waterwheel Generators—Second 65,000-kv-a. unit installed at Niagara Falls; many other large size generators constructed.

Automatic Stations—Standardization carried out; increased use for hydro-electric generators in mining and industrial service; supervisory control systems developed.

Distribution

Frequency Converters—Exceptionally large size converters used to regulate power transferred between systems of different frequencies; automatic control used.

Switching Apparatus—Standardization continued in 66,000-volt equipments for outdoor stations; new industrial substation provides for switching of 13,200-volt incoming line and stepping down to 440-volt and 110/220-volt; high interrupting oil circuit breakers improved; new top-connected moderate interrupting capacity breakers produced; high capacity direct-current air circuit breaker developed.

Mercury Connectors—Glass enclosed connectors filled with mercury and inert gas developed for switching service where usual copper or carbon contacts are unsatisfactory.

Transformers—Largest self-cooled transformers, 15,000 kv-a., largest water-cooled units, 20,000 kv-a., and largest air blast units, 18,500 kv-a., installed during 1924; marked improvements made in methods of changing transformer voltage under load; new load indicator for distribution transformers produced.

Subway Primary Cutout—Fusible primary cutout, operating on new principle, provides economical protection for all apparatus.

High Voltage Bushings—Oil-filled bushings, standard for operating voltages above 73,000 developed for voltages between 50,000 and 73,000; oil-filled terminals for high voltage underground cables produced and standardized.

Conductor Cable—Progress in developing insulated underground high tension cables included trial of single conductor paper insulated cable for 110-kv. circuit no larger in size than 66,000-volt circuit cable now in use.

Cable Testing Sets—Increased use of kenotron testing sets; research in determination of fault reduction continued with new 200,000-volt outfit.

Industrial

Industrial Motors—Single-phase motor development continued; new synchronous motors constructed for compressor drive; high-speed drawn-shell motor produced for "built in" operation of small machines.

Industrial Motor Control—Enclosure of motor starters and speed controllers completed; fractional horse-power motor controls improved; new control devices developed.

Motor Applications—New motors used to drive boiler stokers and fans, newspaper presses, textile finishing machinery, tower hoists, conveyors, and woodworking machinery.

Mining—Largest automatic mine hoists yet installed are equipped with current limit of retardation and rope speed limit when handling men.

Steel Mills—A 14-in. continuous merchant mill equipped with electric drive rolls large tonnage of diversified products; individual drives with wide speed range enable it to do work of two or three less flexible mills.

Elevators—Improved speed regulation of high speed elevators provides accurate landing and regular speeds at all loads.

Industrial Heating—Increased use of electric furnaces for heat treating and vitreous enameling.

Electric Welding—New type direct-current arc-welding generator produced; increased use of automatic arc welders; welding of galvanized iron with suitable electrode proved feasible.

Transportation

Electric Ship Propulsion—More ships equipped with Diesel-electric drive; new electric mooring winch first used.

Steam Railroad Electrification—Sixty-ton oil-electric switching locomotive built; unusual freight locomotives built for N.Y., N.H.&H. Railroad convert trolley alternating-current to direct-current for driving motors.

Electric Railways—Many lighter weight cars installed; extensive rehabilitation of rolling stock and supply equipment; increased use of automatic substations.

Mine and Industrial Haulage—Seventy-five-ton storage battery locomotive, largest of type, placed in service; standard arrangement of control adopted for all locomotives provides for either drum or contactor control.

Scientific

Lightning Generator—Continued research in the effects of lightning on transmission lines demonstrated that grounded wires near line contactors reduce lightning voltages and provide excellent protection against direct strokes.

X-Ray Tubes—250,000-volt, 50-milliampere tubes placed in commercial production for first time; very small tubes, recently developed, make possible a complete self-contained portable X-ray outfit.

Fused Quartz—Production of clear fused quartz commercialized; opaque fused quartz used for insulations for high tension experimental work.

Miscellaneous

Totalizing Recording Wattmeters—New totalizing recording wattmeters make possible direct, automatic control of indicating apparatus, control apparatus, signal systems, and anything dependent upon magnitude of station load.

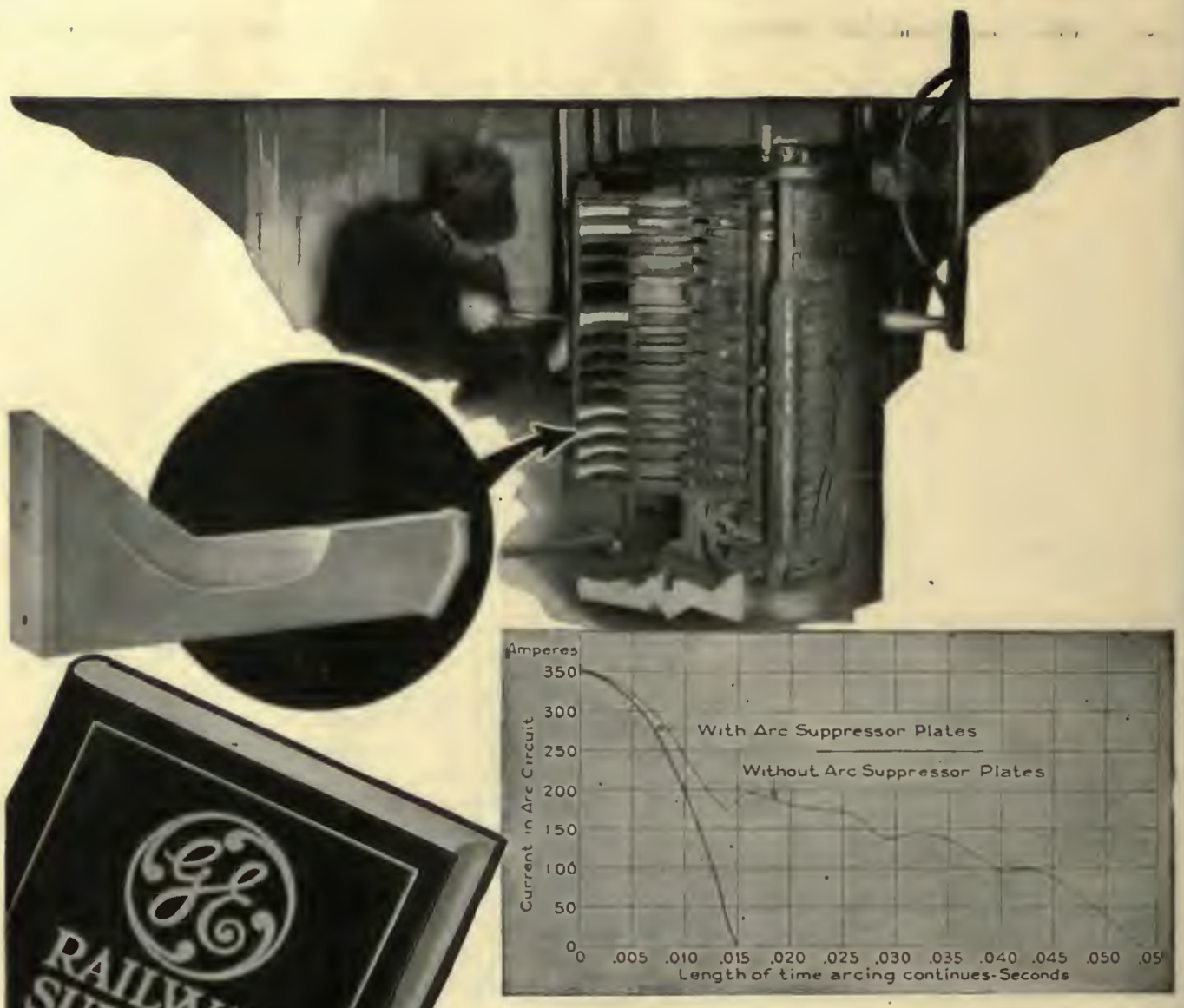
Electrically Operated Flow Meters—Vacuum gauges and a water level indicator produced which utilize the principle of the electrically operated flow meter, permitting indicating instruments to be located at any distance from apparatus.

Radio—Quality of radio transmission improved; low power tube transmitters installed on destroyers; equipment developed to convert ship's spark transmitters to continuous wave.

Carrier Current—New standard multi-power set embodies inter-phase operation, single-frequency duplex, and selective ringing; practical portable set manufactured for central station use.

Lighting—Use of incandescent lamps showed marked increase; new dust-proof lighting units for industrial plants produced; lighting beacons installed on U.S. Air Mail fields; radio transmission of photographs made possible by use of small high speed MAZDA lamp; research made in use of light to show strains in structural material; complete line of traffic signalling apparatus designed; floodlighting units developed for railway yard use; more intensive street illumination ordered by many cities; standardization of street lighting classifies streets and proper lighting intensities for each class.

Supercharger—New, lighter type supercharger, with superior cooling, developed.



Notice the Difference

These curves show the difference in time required to disrupt the arc in a K-35 Controller when equipped with G-E Arc Suppressor Plates. They are plotted from actual oscillograph test data.

G-E Arc Suppressor Plates reduce carbonization and eliminate much trouble from pitting of contacts. All new Controllers with individual finger blowouts are equipped with them.

It will pay you to put them in your old Controllers. The plates are inexpensive, and easy to install. Try them.

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Electric Railways Are Forging Ahead

ELECTRIC railways of the United States and Canada purchased 4,092 new cars and locomotives during the year 1924. This is more than in any year since 1913. They also increased their facilities for handling the public by purchase of 963 new motor buses. They junked 1,853 old cars—more than in any year of which this paper has record. They built 312 miles of track extensions, which is the most in any year since 1918. They reconstructed 764 miles, exceeded only by the high figure of 1923, namely 854 miles. The total of track built and rebuilt and new electrification amounts to 1,160 miles—greater than in any year since 1915.

During the year 1924 the electric street and interurban railways of the United States expended $262,700,000 in the purchase of materials, supplies and equipment for new plant and for maintenance purposes. In 1925 they plan to spend for the same items $342,000,000. This is more than in any recent year and it gives the prospect of increasing activity along the line of improvements and expansions during the new year. In other words, the program of modernization is to go forward with even greater intensity.

During the year just past more new financing for electric railways was done than in any recent year. The total of items exceeding $200,000 was $85,085,000, which was over four times the amount sold in 1923. And this was done on better terms than heretofore. Much greater use was made of the car trust plan in financing purchases of new rolling stock. A new feature of the year's financing was the employment of the passenger partnership or customer ownership method to the extent of $9,750,000 by 10 strictly electric railway properties. Maturities of large bonded obligations during 1925 will amount to $28,224,000, which is only about one-third of the similar obligations that had to be met in 1924.

The number of new receiverships during the year was 12, the same as last year. Companies coming out of receivership numbered 18. The total capital involved in all roads remaining in receivership at the end of 1924 is $117,000,000 less than the total at the end of 1923, and the mileage is 338 less.

The use of buses by electric railways is rapidly extending. The number of companies operating buses increased during 1924 from 121 to 156. The number of buses owned increased from 1,207 to 2,462. Further large additions to the bus equipment of the electric railways is known to be imminent.

In a few words, then, this is the picture of the progress of the industry during 1924 as shown by the statistics compiled by the JOURNAL editors and presented in this number. It is indeed impressive. Far from going backwards, the industry is forging ahead. It is improving its condition in every respect. It is getting rid of old cars and putting new ones in service to secure more economical operation and make the service more attractive. It is supplementing the rail service with bus lines. The fear of buses has given way to a pretty definite idea of where and how to capitalize upon this new transportation tool. Public relations are much improved. Fares are adjustable and are up about where they ought to be. Labor is more stable. Financing is easier. The American Electric Railway Association is functioning better than ever. Truly, the electric railways have risen to a new plane of stability and security.

Car Design as Reflected by Purchases in 1924

THE number of new cars ordered during 1924 continued at the high level reached in 1923. This is very encouraging as the total volume of electric railway business follows closely the amount of rolling stock purchases and indicates a promising future with more passengers, better service and increased earnings. The 4,000 mark in number of cars ordered, considered as a high average, has again been exceeded this year with a total of 4,092 new cars and electric locomotives. Compared with other years this is the highest since 1913. The years of 1917, 1918 and 1919 were lean ones with the average number of new cars running about 2,400. The low point for rolling stock purchases was in 1921 with but 1,276 cars and electric locomotives. The number purchased in 1922 was 3,538 and in 1923 there were 4,029.

The greatest percentage increase in cars ordered is for interurban service. There is a 26 per cent increase in interurban passenger cars over last year and the total of 538 is the largest for any year since 1913. It is evident that the financial condition of the interurbans is improved. Their traffic and their purchasing power should increase as modernization goes on.

It is interesting to follow the trends in car design as reflected in the statistics year by year. Previous to 1916 cars were heavy, the principal thought being to reduce maintenance through substantial construction. The vestibuling of platforms was an improvement of that period, which was followed by many center-entrance type cars without platforms. In 1916 light-weight construction was a principal feature and with it came the one-man, single-truck car. From 1916 through 1919 the one-man, single-truck car increased in popularity, so that in 1919 this type of car constituted 69 per cent of the total motor-passenger cars purchased for city service. That was the peak for small one-man cars. Since then larger cars have been increasingly favored for one-man operation.

In 1922 cars arranged for operation by either one or two men made their appearance. During 1924 this has been the most common type of car purchased. Thus, the total number of new cars for city service of one-man, two-man type was 1,224, which is 62 per cent of the total number of motor-passenger cars purchased for city service.

An outstanding feature in the development of car design last year was the increased attention given to large articulated units. The Department of Street Railways for the City of Detroit placed a triplex car in service last March and the Brooklyn-Manhattan Transit Corporation has ordered four triplex cars which will be placed in rapid transit service soon. In addition to these orders from car builders, the United Railways & Electric Company of Baltimore remodeled two cars to form a duplex articulated car, which is now being tried out. The Brooklyn-Manhattan Transit Corporation placed a similar type of articulated unit in service last February and the Milwaukee Electric Railway & Light Company is now rebuilding 384 bodies to form 192 duplex articulated units.

The advantages of these types of car include reductions in weight, noise, first cost and operating cost together with possible increase in comfort and convenience for passengers. The particular field of usefulness for articulated cars is in service where train operation is needed. This applies particularly to interurban and rapid-transit service, since there are few cities where surface traffic is so heavy that such units can be used to their fullest advantage.

Although the statistics for 1924 show that large cars are being purchased most, light weight has been a particular feature of new car design. Previous to 1924 weight reduction for city cars was stressed most, but last year's statistics show that this evolution is strongly penetrating the interurban field. The average weight for the double-truck interurban cars purchased last year was 19 tons for a car 44 ft. long.

Eight outstanding facts are shown by the 1924 statistics of electric cars ordered. First, the total number of new cars and electric locomotives is the highest of any year since 1913. Second, the number of passenger cars purchased for city service decreased 32 per cent from the 1923 figures. Third, the number of passenger cars purchased for interurban service increased 26 per cent over 1923 and the number is the largest for any year since 1913. Fourth, the number of electric locomotives bought in 1924 is but one-third as many as in 1923. Fifth, cars built for operation by one man or two men constitute over 62 per cent of the total motor-passenger cars ordered for city service. Sixth, multiple bodied articulated cars are receiving particular consideration. Seventh, light-weight car construction has been given increased attention. Eighth, four-motor equipments are used for the majority of double-truck cars.

Bus Operation by Electric Railways Shows Satisfactory Progress

NOTHING could promise better for the continued success of bus operation by electric railways than the gratifying progress that has been made during the past year. The number of buses has more than doubled while the number of railway companies engaging in bus operation is nearly a third larger than a year ago.

This growth is a healthy sign. It has been rapid enough to indicate that the railways are thoroughly alive to the opportunities which the bus has created, but it has not been too fast. That is to say, railways have not rushed into the use of buses without careful analysis of transportation needs and the ability of buses to fill them.

Particular significance attaches to the fact that the increase in the number of buses has been proportionately much greater than the increase in the number of railway companies operating them. In other words, the primary reason for the great development during the year is that many railways have found buses useful and have added to the number which they were operating a year ago.

This seems to indicate that the experience of those who have tried bus operation has for the most part been satisfactory. In fact, according to the reports which the JOURNAL has received, only one important railway which operated buses a year has abandoned this type of service. In this instance a street railway line was built into the district formerly served by the buses, and with the inauguration of car operation there was no longer any need for the buses.

Another reason for the increase in the number of buses is, of course, the constantly growing number of railway companies which have undertaken this form of transportation service. Since the publication of a list

of electric railway bus operators in the 1924 Statistical Number of this paper, a net addition of 35 companies has been made to the list. A majority of the newcomers in the bus business have been among the smaller railways, and the number of buses which they operate is not large. Nevertheless, this expansion is an interesting indication of the widening understanding of the field of usefulness of the bus.

Buses ordered during the year by electric railways total nearly 1,000. This figure is much larger than that for any previous year. Indications are that it will be greatly exceeded in 1925. That the number of buses ordered is 963 while the number shown as added to the equipment of electric railways is 1,255 may be accounted for in large measure by the acquisition of many independent bus lines, together with much second-hand equipment.

These record-breaking figures for buses owned and ordered by electric railways during the past year carry all the more weight because of the care exercised in obtaining the information. In nearly every case this was secured directly from an official of the company concerned. Because bus operation is carried on in certain instances by a subsidiary under another name, however, it is possible that a few railways have been omitted from the list. Such omissions, if they exist, do not greatly affect the figures, and their inclusion would serve only to augment a total which is already impressive.

More New Track Built than in Any Other Recent Year

THAT a greater mileage of new electric railway track was built in 1924 than in any other year since 1917 is particularly significant because this occurred during a period when the number of buses operated by railway companies was more than doubled. Thus it seems that the industry is expanding simultaneously in two directions. On the one hand the railways each year are furnishing more and better bus service, while on the other hand they are increasing their trackage to provide additional car service.

A study of the details of track extensions made during the past year by 112 different companies shows that the increase was due to many small additions rather than to a few very large ones. A majority of the railways reporting extensions constructed less than 4 miles apiece. Thirteen railways added 5 miles or more to their trackage. In California the San Diego Electric Railway built 19 miles of interurban line and 3 miles of city track. Other large extensions include those of the Philadelphia Rapid Transit Company and the Detroit United Railway with about 11 miles each, and the Cincinnati Traction Company, Pacific Electric Railway and Toronto Transportation Commission with more than 10 miles each.

From the figures of track rebuilt the impression is derived that the industry has nearly caught up with its deferred reconstruction. The total for 1924 was just over 764 miles, which is slightly less than for the preceding year. It is larger, however, than for 1922 or for any other post-war year, except 1923.

Electrification of steam railroad lines continued at a rate considerably in excess of that of the preceding year or any year since 1919. A total of more than 80 miles was electrified during 1924. The combined total of electrifications and electric railway track built and rebuilt exceeds the corresponding figures for 1923, and is the greatest for 7 years.

Electric Railway Costs Becoming Stabilized

IN LAST year's Annual Statistical Number the prediction was made that electric railway operating costs were becoming stabilized and that little change should be anticipated during the year. That this forecast was justified may be seen by reference to the article in this week's issue by Professor Richey, in which he presents the trend of costs and fares during 1924. In wholesale prices the changes from month to month were fractional, the index for November, 1924, being 153 as compared with 152 for the corresponding month of 1923. Construction costs showed a small but steady downward trend during the year, falling 11.7 points to 203.6 for December. Electric railway operating materials showed a smaller drop, from 158 to 149. Wages, on the contrary, went up from 216.4 to 220.8, but this was about balanced by an increase in fares from 142.4 to 148.1.

All of these figures show a notable stabilization in costs as compared with the violent fluctuations of the years before. It means that managers can now proceed with more confidence in making estimates for expenditures, and can plan for the future with the assurance that their calculations will not be upset overnight.

With conservatives in control at Washington, and a continuing constructive national policy, it seems fair to assume that in the year just beginning the stabilization of last year will be continued. This points clearly to prosperity for the country as a whole and a continuation of satisfactory conditions for the majority of the electric railways. While it is too early to be certain, the probabilities seem to point in the direction that these conditions will prevail all through the Coolidge administration.

Are Your Job Seekers Treated This Way?

HE STEPPED into the anteroom of the office of B. J. Fallon, general manager Chicago Rapid Transit Company, with the timid, apologetic air so often observed on the face of the job seeker. In half-whispered tones he asked the man at the information desk if this was where he could apply for work. He was put at his ease in a moment. The good-natured information man was not content merely to direct him to Room So and So on another floor, but first wrote down the number on a slip and then called upon a boy to escort the applicant to the correct room. The courtesy of the transaction could not have been exceeded if the visitor had been a wealthy man come to confer a favor.

It is not known whether the applicant was the right man for any railway job, if such job was available. It is certain, however, that he must have left the building with the feeling that this particular railway was not a heartless institution, but a rather human affair after all. If he and a railway job did come together, his reception in the anteroom was the right beginning. Whenever a courtesy bulletin comes down from above, he will not forget his first contact as proof that the management practices what it preaches.

$342,000,000 of Purchases Planned in 1925

Largest Expenditures in Many Years in Prospect by Electric Railways of U. S. This Year—"Journal's" Estimate of Industry Budget for New Year Shows 30 per Cent Increase Over Purchases of 1924

ELECTRIC railways of the United States will spend in 1925 the sum of $211,500,000 for new plant and equipment. This is $73,500,000, or 59 per cent, more than the actual expenditure for new plant and equipment during 1924. They will spend $130,500,000 additional for maintenance materials and supplies. This is about the same amount as last year.

The total expenditures planned in the tentative budgets of the electric railways for 1925, exclusive of all labor costs, is thus somewhere in the neighborhood of $342,000,000. This compares with an actual expenditure in 1924 of $262,700,000—an expected increase for 1925 of 30 per cent.

In compiling these estimates of expenditures, information was requested as to what the railways plan to buy during the coming year and what they did buy during the past year. Under the classification of expenditures "for new plant and equipment" was to be included such items as new cars and car equipment, track tools and materials, paving materials, shop machinery and tools, power equipment, buildings and structures, and any other items which will be a permanent part of the railway plant. Under the classification of expenditures "for maintenance materials and supplies" was to be included all items purchased for the regular repair and maintenance work in all departments and the supplies and materials consumed in operation. This includes the numerous detail supplies such as motor brushes, waste, oil, brake shoes, metal stock, wheels, miscellaneous small tools, trolley wire and other line materials for replacements, etc. In both classifications the figures were requested for expenditures exclusive of labor. The sums here presented are thus of course only a part of the enormous outlay of moneys by the electric railways to cover all operating expenses and the charges to capital account.

The figures are tabulated herewith to show a comparison of the probable expenditures during 1925 with the estimates of actual expenditures during the years 1922, 1923 and 1924. From this it will be seen that the new year holds forth the prospect of larger expenditures than in any previous year since the JOURNAL started this estimate of the industry's budget. Looking at the figures by major accounts, all items show an increase over former years except one. The purchases for maintenance of equipment show a decrease of about $2,000,000.

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

	1922	1923	1924	1925
New Plant and Equipment				
Way and structures	$85,000,000	$74,000,000	$56,000,000	$75,700,000
Equipment	38,000,000	78,000,000	60,200,000	103,400,000
Power	28,000,000	28,000,000	17,000,000	32,400,000
Total	$151,000,000	$180,000,000	$133,200,000	$211,500,000
Maintenance Materials and Supplies				
Way and structures	$42,000,000	$57,500,000	$58,200,000	
Equipment	44,000,000	54,000,000	52,100,000	
Power	16,000,000	18,000,000	20,200,000	
Total	$102,000,000	$129,500,000	$130,500,000	
Total of New Plant and Maintenance Materials				
Way and structures	$116,000,000	$113,500,000	$133,900,000	
Equipment	122,000,000	114,200,000	155,500,000	
Power	44,000,000	35,000,000	52,600,000	
Grand total	$282,000,000	$262,700,000	$342,000,000	

The largest increases in comparison with last year are for new equipment and new power facilities. For the latter there is an indicated increase in expenditures of 90 per cent; for new equipment, an increase of 71 per cent. But there is also to be a large expansion of trackwork, this indicated increase being 35 per cent.

The method employed this year in compiling this estimate of the budget of the electric railway industry is the same as that followed last year and the year before and explained in detail on page 30, issue of Jan. 6, 1923, and again on page 4, issue of Jan. 5, 1924. This year budget figures were received from 51 companies, from which the estimate of the whole industry was calculated, using as heretofore both track mileage and cars operated as bases of spreading the known budget units. The average of the two methods was used for the final figures, since neither alone is a proper measure of the buying power of the industry.

By requesting not only the estimate of expenditures planned for the new year but also the actual expenditures made during the year just past, the JOURNAL obtains a check upon its previous year's estimate of the future purchases. The actual figures this year are in close agreement with the amounts estimated last January, as follows:

	Estimated in Issue of Jan. 5, 1924	Actual Disclosed This Issue
New Plant and Equipment		
Way and structures	$53,000,000	$56,000,000
Equipment	70,000,000	60,200,000
Power	27,000,000	17,000,000
Total	$150,000,000	$133,200,000
Maintenance Materials and Supplies		
Way and structures	$44,000,000	$57,500,000
Equipment	53,000,000	54,000,000
Power	15,000,000	18,000,000
Total	$112,000,000	$129,500,000
Total for New Plant and Maintenance Materials		
Way and structures	$97,000,000	$113,500,000
Equipment	123,000,000	114,200,000
Power	42,000,000	35,000,000
Grand total	$262,000,000	$262,700,000

This comparison is of course not a measure of the accuracy of the JOURNAL'S work, but rather a statement of the extent to which budget plans were actually carried out and expenditures made within the year in which they were anticipated.

Bus Operation by Electric Railways Doubled During 1924

The Number of Railway Companies Furnishing Bus Service Has Increased from 121 to 156 and Many Others Have Extended the Scope of Their Operations—Buses Now Operated by Railways Total 2,462—A Larger Number Were Ordered During 1924 than in Any Previous Year

AT THE end of 1924 the number of buses operated by electric railways in the United States and Canada was approximately twice the number in operation a year ago, as shown in a survey conducted by this paper. This big increase occurred in large measure because many railways which were operating buses in 1923 added more during the year just past. At the same time there was also a marked increase in the number of companies engaged in these undertakings. Figures given in the accompanying tables are based on replies received directly from the companies named and may be taken to represent an irreducible minimum. Because bus operation is carried on in some instances in the name of a subsidiary company, it is possible that a few smaller railways have been omitted from the list. Their inclusion, however, would not greatly affect the total figures.

The expansion was confined to no one section of the country. The largest increase in the number of buses was made by a railway on the Atlantic seaboard, while a company in Ohio was second, and another in California added the third largest number. Substantial increases were made in nearly every state and also in Canada.

During the year the largest single addition to the number of buses operated was made by Public Service Railway, Newark, N. J., which added more than 500 buses to its equipment. This was done as part of an extensive plan to buy out competitive buses and co-ordinate the transportation service throughout the area where the railway operates. Already great progress has been made toward this end. There remain, however, a considerable number of buses which are still running in competition with the railway. This competition will have to be eliminated before the transportation system can be entirely co-ordinated. All of the buses thus bought by the railway were second-hand machines. Many of them, however, have since been retired from service and their places taken by new vehicles. For that purpose, Public Service Railway has bought a large number of Yellow Coaches, White, Fageol and Mack buses. More buses of the first two types are on order at the present time and delivery is expected in the near future. As a result of this great expansion, this

List of Electric Railways Operating Buses

Railway	Subsidiary	No. Buses
Connecticut		
Danbury & Bethel St. Ry., Danbury		4
Connecticut Co., New Haven		60
Groton & Stonington St. Ry., Norwich		5
Hartford & Springfield St. Ry., Warehouse Point		7
Waterbury & Milldale Tramway, Waterbury		1
Maine		
York Utilities Co., Sanford		5
Massachusetts		
Attleboro Branch RR., Attleboro		2
Eastern Massachusetts St. Ry., Boston		43
Boston Elevated Ry., Boston		66
Connecticut Valley St. Ry., Greenfield		3
Northern Massachusetts St. Ry., Greenfield		1
Holyoke St. Ry., Holyoke		2
Union St. Ry., New Bedford		3
Middlesex & Boston St. Ry., Newtonville		12
Plymouth & Brockton St. Ry., Plymouth		2
Springfield St. Ry., Springfield		9
Rhode Island		
Newport Elec. Corp.		7
United Electric Rys., Providence		48
Vermont		
Twin State Gas & Electric Co., Brattleboro		3
Delaware		
Tide water Power Co., Wilmington		3
District of Columbia		
Capital Traction Co.		11
Washington Ry. & Electric Co.		23
Washington & Virginia Ry.		2
Maryland		
United Rys. & Electric Co., Baltimore	Baltimore Transit Co	44
Potomac Edison Co., Cumberland		2
Potomac Public Service Co., Frederick		15
New Jersey		
Millville Traction Co., Millville		7
Coast Cities Ry., Asbury Park		20
Public Service Ry., Newark	Public Service Trans. Co.	593
Morris County Traction Co.		1
Trenton & Mercer County Trac. Co., Trenton	Central Transportation Co.	19
New York		
International Ry., Buffalo	International Bus Corp.	34
Binghamton Ry., Binghamton		1
Jamestown St. Ry., Jamestown		11
United Traction Co., Albany	Capitol District Trans. Co.	2
Newburgh Public Service Corp., Newburgh		32
Brooklyn-Manhattan Transit Corp., N. Y.		10
Niagara Gorge Ry., Niagara Falls	Niagara Gray Bus Line	5
New York State Rys., Rochester	East Ave. Bus Co. & Roch. Ry. Co-ord. Bus Line	17
New York State Rys., Syracuse	Syracuse Ry. Co-ordinated Bus Line	7
New York State Rys., Utica	Utica Ry. Co-ordinated Bus Line	2
Pennsylvania		
Altoona & Logan Valley Elec. Ry., Altoona	Logan Valley Bus Co.	11
Schuylkill Ry., Girardville		6
Johnstown Traction Co., Johnstown	Traction Bus Co.	5
Conestoga Traction Co., Lancaster	Conestoga Trans. Co.	2
Lewistown & Reedsville Elec. Ry., Lewistown	Lewistown Trans. Co.	2
Beaver Valley Traction Co., New Brighton		6
Citizens Traction Co., Oil City	Citizens Transit Co.	4
Philadelphia Rapid Transit Co., Philadelphia	Phila. Rural Transit Co.	17
Westmoreland County Railway, Pittsburgh		2
Pittsburgh, Harmony & Butler & New Castle Ry., Harmony		5
Jefferson Traction Co., Punxsutawney		2
Reading Transit & Light Co., Reading		3
Scranton Ry., Scranton	Scranton Bus Co.	2
Northumberland County Ry. Sunbury	Sunbury Transit Co.	2
Philadelphia & West Chester Traction Co., Upper Darby		3
West Chester St. Ry., West Chester	Peoples Transportation Co.	21
Williamsport Pass. Ry., Williamsport	Williamsport Transp. Co.	3
York Rys., York	York Transit Co.	5
Virginia		
Newport News & Hampton Ry., Gas & Electric Co., Hampton		5
West Virginia		
Wheeling Public Service Co., Wheeling		4
Monongahela Power & Ry., Fairmont	Pioneer Transport Co.	3
Princeton Power Co., Princeton		1

List of Electric Railways Operating Buses (Concluded)

Railway	Subsidiary	No. Buses
Illinois		
Centralia Traction Co.		1
Chicago & West Town Ry., Oak Park		7
Chicago, North Shore & Milwaukee, Highwood		43
Evanston Ry., Evanston	Evanston Bus Co.	5
East St. Louis & Suburban Ry., East St. Louis		6
Chicago & Joliet Electric Ry., Joliet	Chicago & Joliet Trans. Co.	2
Illinois Power & Light Corp., Decatur		15
Illinois Power & Light Corpn., Galesburg		4
Illinois Power & Light Corp., Peoria		6
Bloomington, Pontiac & Joliet Ry., Pontiac		1
Rockford & Interurban Ry., Rockford		6
Tri-City Ry., Rock Island		2
Indiana		
Union Traction Co. of Indiana, Anderson		1
Evansville & Ohio Valley Ry., Evansville		1
Gary St. Ry., Gary		16
Interstate Public Service Co., Indianapolis		11
Chicago South Bend & Northern Indiana Ry., South Bend		13
Iowa		
Des Moines City Ry., Des Moines		3
Mississippi Valley Elec. Co., Iowa City		5
Dubuque Electric Co., Dubuque		3
Waterloo, Cedar Falls & Northern Ry., Waterloo	Cedar Valley Road	7
Kentucky		
Louisville Ry., Louisville	Kentucky Carriers Inc.	12
Michigan		
City of Detroit Dept. of St. Rys., Detroit		25
Grand Rapids Ry., Grand Rapids		6
Michigan Electric Ry., Jackson		19
Muskegon Traction & Lighting Co., Muskegon		2
Saginaw Transit Co., Saginaw		28
Minnesota		
Twin-City Rapid Transit Co., Minneapolis		3
Missouri		
Kansas City, Clay County & St. Joseph Ry., Kansas City		6
United Rys., St. Louis	St. Louis Bus Co.	4
Springfield Traction Co., Springfield		14
Ohio		
Northern Ohio Traction & Light Co., Akron	Northern Transit Co.	75
City of Ashtabula Div. of St. Rys., Ashtabula		3
Columbus, Newark & Zanesville Elec. Ry., Columbus	Columbus & Zanesville Transp. Co.	13
Ohio Service Co., Coshocton		5
Columbus, Urbana & Western Elec. Ry.		2
Steubenville, East Liverpool & Beaver Valley Traction Co., East Liverpool	Valley Motor Trans. Co.	2
Hocking Sunday Creek Trac. Co., Nelsonville		1
Indiana, Columbus & Eastern Traction Co., Springfield		16
Springfield Ry., Springfield		1
Pennsylvania-Ohio Elec. Co., Youngstown	P. O. Coach Lines.	39
Youngstown Munic. Ry., Youngstown		41
Youngstown & Suburban Ry., Youngstown	Y & S Transportation Co.	14
Wisconsin		
Wisconsin Public Service Corp., Green Bay	Riverview Motor Bus Co.	2
Wisconsin Gas & Electric Co., Kenosha		8
Milwaukee Elec. Ry. & Light Co., Milwaukee	Wisconsin Motor Bus Lines	104
Eastern Wisconsin Electric Co., Oshkosh		14
Wisconsin Valley Electric Co., Wausau	Valley Transit Co., Merrill Bus Line	4
Alabama		
Birmingham Electric Co., Birmingham		4
Arkansas		
Inter-City Terminal Ry., North Little Rock		12
Georgia		
Columbus Electric & Power Co., Columbus	Columbus Trans. Co.	3
Louisiana		
New Orleans Public Service, New Orleans		10
Mississippi		
Vicksburg Light & Traction Co., Vicksburg		2
North Carolina		
Carolina Power & Light Co., Raleigh		2
South Carolina		
South Carolina Gas & Elec. Co., Spartanburg		4
Tennessee		
Nashville Interurban Ry., Nashville		1
California		
Bakersfield & Kern Elec. Ry., Bakersfield		5
Los Angeles Ry., Los Angeles	Los Angeles Motor Bus Co.	*112
Pacific Electric Ry., Los Angeles	Pacific Electric Land Co.	154
San Francisco & Sacramento Ry., T. F., Oakland		1
Key System Transit Co., Oakland		13
Pacific Gas & Electric Co., Sacramento		4
San Diego Electric Ry., San Diego		10
Munic. Ry. of San Francisco		10
Peninsular Ry., San Jose		3
Santa Barbara & Suburban Ry., Santa Barbara		6
Stockton Electric Ry., Stockton		3
Kansas		
Salina St. Ry., Salina		1
New Mexico		
City Electric Co., Albuquerque		2
Oklahoma		
Tulsa St. Ry., Tulsa		16
Okmulgee Traction Co., Okmulgee		3
South Dakota		
Sioux Falls Traction System, Sioux Falls		8
Texas		
Abilene Traction Co., Abilene		1
Eastern Texas Electric Co., Beaumont		1
Houston Electric Co., Houston		18
Marshall Traction Co., Marshall		1
San Antonio Public Service Co., San Antonio		16
Utah		
Utah Light & Traction Co., Salt Lake City		1
Washington		
Puget Sound Int. Ry., & Pwr. Co., Everett		17
Puget Sound Elec. Ry. Co., Bellingham		12
Pacific Northwest Traction Co., Seattle	Thompson-Smith Trans. Co.	31
Seattle Munic. St. Ry., Seattle		14
Seattle & Rainier Valley Ry., Seattle		2
Puget Sound Electric Railway, Tacoma		12
Canada		
British Columbia Electric Ry., Vancouver	British Columbia Rapid Transit Co.	11
Brantford Munic. Ry., Brantford		2
Winnipeg Electric Ry., Winnipeg		16
Nova Scotia Tramways & Pwr. Co., Halifax		2
Hydro Electric Rys., Toronto		4
Toronto Transportation Co., Toronto		20
Montreal Tramways, Montreal		4
Ottawa Electric Railway, Ottawa		5
Quebec Railway Light & Power Co., Quebec		4
Total		2,462

*Includes 78 buses in which railway has one-half interest.

company now owns 593 buses, which is more than twice as many as any other railway in this country. Indications are that a year from now the number of buses owned by Public Service will be considerably larger than it is at the present time.

Second in number of buses added during the year is the Northern Ohio Traction & Light Company at Akron, which now owns 75 buses. This increase has come about as the result of the total suspension of railway service from Feb. 1 to 28 of this year, and the subsequent resumption of operations on a new basis, as told in ELECTRIC RAILWAY JOURNAL for March 1.

In California the addition of 52 buses to the equipment of the Pacific Electric Railway, Los Angeles, was the third largest increase during the year. This company has now become the second largest operator of buses in the country, with 154 vehicles. Of this number 39 are operated by the Los Angeles Motorbus Company. In this same territory the Los Angeles Railway owns 34 buses, and has a half interest in 78 others, making a total of 112. Altogether the two railways are engaged in the operation of 266 buses in this part of the state. It appears possible that developments during the coming year may deprive the Pacific Electric Railway of second place in number of buses, as the Philadelphia Rapid Transit Company has recently ordered 200 new gas-electric buses for operation in that city.

Important increases have occurred in the number of buses operated by electric railways in New England. The Boston Elevated Railway during the past year has added 35 buses, the United Electric Railways of Providence 20, the Connecticut Company 13, and the Eastern Massachusetts Street Railway 12. In this same region the Middlesex & Boston Street Railway, with 12 vehicles, has joined the ranks of bus operators

as told in this paper for Dec. 6. Other new companies in this region include the Waterbury & Millvale Tramway, the York Utilities Company in Maine, and the Newport Electric Corporation.

Bus operation in New Jersey has advanced rapidly outside of the territory of Public Service Railway as well as in it. At Asbury Park the Coast Cities Railway now has 20 buses. A number of these are double-deck vehicles for use during the heavy traffic summer months. The Trenton & Mercer County Traction Company has increased the total number of its buses to 14 and the Millville Traction Company has jumped from one bus to seven.

Reports received from electric railways in New York State indicate that the expansion of railway bus operation there has not been as great as elsewhere. During the year there has been much talk of the establishment of an extensive system of buses in New York City. Proposals have been made that these vehicles be operated by different independent companies, and several of the electric railways have offered to undertake to furnish such service. So far, however, nothing definite has been done. Upstate the New York State Railways has added 14 buses. The United Traction Company of Albany and the Binghamton Railway are newcomers in the field of bus operation.

An order for 200 gas-electric buses for the Philadelphia Rapid Transit Company is the outstanding bus development of the year in Pennsylvania. Elsewhere in the state a number of new names appear in the list of electric railways operating buses. Among these are the Northumberland County Railway, Pittsburgh, Harmony, Butler & Newcastle Railway, the Reading Transit & Light Company, Westmoreland County Railway, Philadelphia & West Chester Railway and the Scranton Railway. In the vicinity of Philadelphia, the West Chester Street Railway has developed bus service covering nearly 200 route-miles. This was told in ELECTRIC RAILWAY JOURNAL for Nov. 22.

A marked increase in the number of buses operated by electric railways has occurred in Ohio. At Youngstown the Pennsylvania-Ohio Electric Company has added 13 buses to its already large fleet, the Youngstown & Suburban Railway and the Youngstown Municipal Railway have added 10 each. The Ohio Service Company and the Columbus, Urbana & Western Railway have undertaken bus operation. In Indiana the Interstate Public Service

Buses Ordered by Railways During 1924

Name of Company	Total	No. of Each Type	Type of Chassis	Body Builder	Seating Capacity
Philadelphia Rapid Transit Co.	200	125*	Yellow Coach Z	Yellow Coach	66
		75	Yellow Coach Z	Yellow Coach	29
Public Service Railway	175	50	White 50 A	Bender	29
		75	Yellow Coach Z	Yellow Coach	29
		25	Mack	Mack	25
		25	Fageol	Fageol	29
Northern Ohio Traction & Light Co.	42	14	White	Bender	21
		10	White	Kuhlman	25
		3	Mack	Mack	25
		3	Mack	Kuhlman	25
		6	Mason	Weatherproof	21
		6	Reo	Fitzjohn	21
Boston Elevated Railway	37	17	Mack	Mack	25
		14	White	Brown	25
		4	White	Brown	25
		1	Yellow Coach	Yellow Coach	29
		1	Fageol	Fageol	29
International Ry., Buffalo	28	16*	.....	.....	..
		12	.....	.....	..
City of Detroit Dept. of St. Rys.	26	25	Dodge-Graham	Graham	21
		1	Gottfreson	Gottfreson	..
Milwaukee Electric Ry. & Lt. Co.	26	10	Yellow Coach Z	Yellow Coach	29
		5*	Yellow Coach Z	Yellow Coach	67
		5	White 50 A	Bender	25
		5	Fageol	Fageol	23
		1	Pierce-Arrow	Bender	26
Los Angeles Railway	22	16*	Fageol	Fageol	58
		5*	Moreland	Moreland	59
		1*	Moreland	Moreland	58
Pacific Electric Ry.	22	12	Fageol	Fageol	29
		10*	Fageol	Fageol	66
Houston Electric Co.	18	10	Fageol	American Car Co.	29
		1	Yellow Coach	St. Louis Car Co.	29
		6	Yellow Coach	Yellow Coach	29
		1	Fageol	American Car Co.	29
Chicago N. Shore & Milwaukee R.R.	17	13	Yellow Coach Z	Yellow Coach	29
		4	Fageol	Fageol	22
United Electric Rys., Providence	17	13	White	Brown	29
		2	Pierce-Arrow	Brown	29
		2	Mack	Brown	29
Connecticut Company	16	4	Yellow Coach	Yellow Coach	29
		4	Pierce-Arrow	Pierce-Arrow	29
		2	Mack	Mack	25
		2	Mack	Bender	29
		2	Fageol	Fageol	29
		2	White	Hoover	29
Coast Cities Ry.	16	9*	Yellow Coach	Yellow Coach	67
		7	Yellow Coach	Yellow Coach	29
Trenton & Mercer County Tract. Co.	13	11	Fageol	Fageol	29
		1	Fageol	Kuhlman	29
		1	Six Wheel	Six Wheel	29
Middlesex & Boston Street Ry.	12	12	White 50 A	Bender	25
San Antonio Public Service Co.	12	6	Fageol	Fageol	29
		5	Reo	Reo	21
		1	Yellow Coach	Yellow Coach	29
Interstate Public Service Co.	11	11	White	Bender	25
New York State Rys.	11	6	Brockway	Bender	25
		2	Mack	Lang	22
		2	Brockway	N. Y. S. Rys.	18
		1	Brockway	N. Y. S. Rys.	20
Pennsylvania-Ohio Electric Co.	11	10	White 50 A	Bender	25
		1	White 50 A	Bender	20
Chicago S. Bend. & N. Indiana Ry.	10	5	Mack	Mack	25
		5	Garford	Superior	25
Youngstown Munic. Ry.	10	10	.....	.....	.....
South Carolina Gas & Elec. Co.	10	10	White & Graham	Bender	21
Indiana, Columbus & Eastern Traction Co.	9	9	Fageol	Fageol	22
Eastern Mass. St. Ry.	9	2	Brockway	Patterson	21
		7	Fageol	Fageol	27
Key System Transit Co.	8	7	Fageol	Fageol	29
		1	Ford	Key System Trans. Co.	14
Hartford & Springfield St. Ry.	7	6	Guilder	Patterson & Superior	25
		1	Fageol	Superior	25
Newport Electric Corp.	7	5	Fageol	Fageol	22
		2	Fageol	Fageol	29
Mesaba Ry.	7	7	.....	.....	16
Kansas City, Clay County & St. Joseph Ry.	6	5	Fageol	Fageol	28
		1	Graham	Graham	18
Toronto Transportation Comm.	6	6	White 50 A	Smith Bros. & T.T.C.	29
Eastern Wisconsin Elec. Co.	6	6	.....	.....	..
Chicago & West Towns Ry.	5	5	Mack	Mack	26
New Orleans Public Service, Inc.	5	5	Yellow Coach	Yellow Coach	29
Springfield St. Ry.	5	4	Garford	Superior	25
		1	Yellow Coach	Yellow Coach	29
Twin City Rapid Transit Co.	5	1	White	Eckland Bros.	16
		1	Mack	Lang	30
		1	White	Eckland Bros.	16
		1	Wilcox	Twin City	30
		1	Fageol	Fageol	30
Seattle Munic. St. Ry.	5	5	Garford	S. M. Ry.	29
Youngstown & Suburban Ry.	5	3	Fageol	Fageol	22
		2	Studebaker	Miller	11
Washington Ry. & Electric Co.	5	3	Graham Type F.A.	Hoover	30
		2	Graham Type J.B.	Hoover	20
Gary St. Ry.	4	4	Yellow Coach	Yellow Coach	29
Illinois Power & Light Corp.	4	2	Yellow Coach	Yellow Coach	29
		2	Reo	Reo	21
United Rys. & Elec. Co. Baltimore	4	4*	5 Ave. Type L	Fifth Ave.	51
Mississippi Valley Electric Co.	4	4	Mack	Mack	26

*Denotes double-deck bus.

Buses Ordered by Railways During 1924 (Concluded)

Name of Company	Total	No of Each Type	Type of Chassis	Body Builder	Seating Capacity
United Rys. of St. Louis	4	4	White	Brown	29
Columbus, Newark & Zanesville Electric Ry	4	2	Fageol	Fageol	22
		2	Fageol	Fageol	28
Winnipeg Electric Co	4	4	G. M. C. K-20		24
Altoona & Logan Val. Elec. Ry	4	2	Garford	Garford	25
		2	Garford	Garford	21
Reading Transit & Light Co	4	3	Dodge	Graham	22
		1	White	Bender	25
Waterloo, Cedar Falls & N. Ry	3	3	Mack	Mack	25
East St. Louis & Suburban Ry	3	3	Yellow Coach Z	Yellow Coach	29
Pacific Northwest Traction Co	3	3	Fageol	P. N. T.	45
Tidewater Power Co	3	3	Graham	Hoover	18
Williamsport Passenger Ry	3	3	Reo	Reo	21
Sioux Falls Traction System	3	2	White	Eckland	25
		1	Reo W.	Auto Body Co.	21
Wisconsin Gas & Elec. Co	3	..			..
Capital Traction Co	3	2	White	Bender	25
		1	Fageol	Fageol	29
Columbus Ry. Power & Lt. Co	3	3	Mack	American Car Co.	29
Munic. Ry. of San Francisco	2	2	White 50 A	Brown	25
Springfield Traction Co	2	1	Federal	Local	..
		1	Graham	Graham	..
United Traction Co., Albany	2	2	Pierce-Arrow	Brown	29
Syracuse & Eastern R.R.	2	2	Reo W	Patterson Vehicle Co.	..
Carolina Power & Light Co	2	1	White	Bender	16
		1	White	Bender	21
Scranton Ry.	2	2	Dodge-Graham	Dodge-Graham	20
Westmoreland County Ry	2	2	Fageol	Fageol	29
Wisconsin Valley Electric Co	2	2	G. M. C.	Old body used on new chassis	13
Michigan Electric Railway	2	2			..
Aurora, Elgin & Fox Riv. Elec. Co.	2	2	White	Shaefer	..
San Francisco-Sacramento R.R.	1	1	Fageol	Hall-Scott Co.	29
Asheville Power & Light Co	1	1	White	White	..
Bloomington, Pontiac & Joliet Ry.	1	1	White	White	16
City of Ashtabula	1	1	Mack	Kuhlman	29
Union Traction Co. of Indiana	1	1	Pierce-Arrow	Kuhlman	..
York Railways	1	1	Fageol	Fageol	29
Marshall Traction Co	1	1	Reo	Reo	22
Utah Light & Traction Co	1	1	White	White	12
Abilene Traction Co	1	1	Reo	Reo	21
Dayton, Springfield & Xenia So. Ry.	1	1	Garford	Garford	21
Waterbury & Milldale Tramway	1	1	White	Kuhlman	24
Evansville & Ohio Valley Ry	1	1	Graham	Graham	17
Binghamton Ry	1	1	Mack	Mack	25
Puget Sound Elec. Ry	1	1	White	Christy	22

*Denotes double-deck bus.

Company has bought 11 buses. The Union Traction Company of Indiana and the Evansville & Ohio Railway have also entered the bus game. At Decatur, Galesburg and Peoria the Illinois Power & Light Corporation is now operating buses. Co-ordination of railway and bus service at Decatur was described in this paper on Nov. 29. The North Shore Line has added 16 buses to its equipment during the year and the Chicago, South Bend & Northern Indiana Railway has added 10.

Expansion of bus operations has marked the railway situation in the south as well as in other sections of the country. Among the companies which during the past year have undertaken to furnish bus service are the Newport News & Hampton Railway, Gas & Electric Company, Columbus Electric & Power Company in Georgia, New Orleans Public Service, Inc., Carolina Power & Light Company, Nashville Interurban Railway, Abilene Traction Company in Texas and also the Marshall Traction Company. Moreover, the San Antonio Public Service Company, the South Carolina Gas & Electric Company and a number of others have made important increases in the number of buses operated.

On the Pacific Coast there has been a gain in the number of buses operated in other districts besides Los Angeles. The Pacific Northwest Traction Company has added 18 buses during the year and the Pacific Gas & Electric Company has undertaken bus operation. Elsewhere throughout California and Washington the railways have also added somewhat to their bus equipment.

Electric railways in Canada have made noteworthy progress in bus operation. The greatest increase in the number of vehicles is that of the British Columbia Electric Railway, Vancouver, which has added nine. The Toronto Transportation Commission has also extended the scope of its bus operation. New railways in Canada listed among those operating buses at present are the Brantford Municipal Railway, the Hydro-Electric Railways, the Ottawa Electric Railway, and the Quebec Railway, Light & Power Company.

More Buses Bought than in Any Previous Year

The number of buses ordered during 1924, according to information compiled by ELECTRIC RAILWAY JOURNAL, was 963. This is an increase of 342 over the number ordered during 1923 and is greater than the number ordered in any previous year. An interesting fact in this connection is that 191 of these were double-deck buses. By far the largest single order of double-deck buses was that of the Philadelphia Rapid Transit Company, which purchased 125. Others were bought in Baltimore, Milwaukee and Los Angeles. Altogether upward of 70 electric railways are included in the list of those ordering new buses during the year.

Other automotive equipment ordered during the year was approximately the same as the year before. The number of trackless trolleys bought was somewhat less, totaling only seven. Seventy-three trucks of various sorts were bought by electric railways. Miscellaneous automotive equipment, including tower trucks, snow loaders, automobile welding outfits and fire apparatus, numbered approximately 25.

	Motor Buses Ordered	Trolley Buses Ordered	Other Automotive Equipment Ordered	Total
1922	240	6	112	358
1923	621	15	148	784
1924	1063	7	105	1175
Increase 1924 over 1923	442	8*	43*	391

* Denotes decrease.

In addition to the buses for which orders have actually been placed, the Detroit United Railways has completed arrangements for financing the purchase of 75 such vehicles. It is understood that these will be 25 single-deck, 29-passenger buses, 10 double-deck, 66-passenger buses, both groups to have six-cylinder motors, and 40 more single-deck four-cylinder buses.

Statistics of the Industry

IN EACH of the Annual Statistical Numbers for some years back, tables have been published showing by states the miles of track and cars operated by the electric railway companies in the United States. A corresponding table, made up from reports obtained for the 1925 McGraw Electric Railway Directory will be published in an early issue of this paper.

It is hoped at the same time to publish a table showing a division of the electric motor-passenger cars into the following classes: City and interurban; one-man, two-man and one-man-two-man. Owing to the desire to base these tables on statistics from the 1925 directory, it has been impossible to publish them this week.

Notes on the News of the Year

An Atttempt to Touch Upon Some of the High Spots of the Year's Work—Serious but Not Too Serious—Many of the Important Events of 1924 Originally Reported to the Extent of 2,000 Pages Pressed Now Into Five

By G. J. MacMurray
News Editor ELECTRIC RAILWAY JOURNAL

APROPOS of the present occasion are the lines of Lewis Carroll to the effect that "Time has come, the walrus said, to speak of many things." Most of it, however, is old stuff. The writer of a review of this kind is in much the same position as was Twain's barber. Running his hand over the face of his illustrious customer, the barber remarked: "Shall I go over it again?" "No," said Mark in his drollest tone, "I heard you the first time." He is telling an old story, and is apt to be rebuked by people who think that an event which happened the day before yesterday is ancient history. Most people are inclined to say as did Richard Brinsley Sheridan: "Our retrospection will be all to the future." In giving up news writing for a day each year to prepare this review I always think of the story of the fellow who went down to Arizona for his health. He turned to painting as a profession and was showing one of his attempts to a visitor from back home.

"And did you do this, John," the visitor said.

"Yes," proudly said the tyro in art, "I did."

"Well, then, for heaven's sake, "Go back to drink. You were a success at that."

ALL RECORDS SMASHED

Going back over the pages of the JOURNAL for the two volumes of 1924, many important items of interest are to be noted in the record of the year's news. It is seen that the electric railways smashed all records in 1923. Figures show that more passengers were carried, more cars operated and more car-miles amassed during the year than for any other similar period. Moreover, revenues were the greatest in the history of the industry. The census figures for 1922, made public in February, 1924, showed that 15,331,401,801 passengers were carried in 1922 as opposed to 14,506,914,573 in 1917. Railway operating revenue was up from $925,477,405 as opposed to $650,149,860 in 1917. For 1921 out of 458 electric railways reporting to the Treasury Department 211 paid income taxes of $3,276,532 on net income of $33,843,158.

The JOURNAL estimated in its issue of Jan. 5 last year that $262,000,000 would be spent during the year for new plant and equipment and maintenance materials. As if this were not enough the JOURNAL proved that electric railway costs were approaching a stabilized condition. As the stenographer wrote it receiverships were the slowest in 13 years. Slowest and lowest is right, Gertrude. More cars were ordered during 1923 than in any year since 1913, and track extension and reconstruction were the greatest in 8 years. In April along came W. H. Sawyer, president of the East St. Louis & Suburban Railway, with his optimistic paper before the Wisconsin Public Utilities Association. His remarks were truly constructive. Later on B. C. Cobb, vice-president of Hodenpyl, Hardy & Company, told how growing traffic and ample rates were helping the situation. Mr. Cobb was speaking before the Babson Institute.

James W. Welsh, executive secretary of the American Electric Railway Association, told the members of the Southwestern Public Service Association why car fares differ. He said that the speech of electric railway men was an unknown language to the car rider. Speed, wages, length of haul, density and investment all affect fares. Any one of these factors alone could more than account for existing variations in fare, but combined the wonder is not that fares range only from 5 to 10 cents, but that they do not reach far wider limits. His paper was a very valuable contribution to the subject and it was later used to good advantage in a number of places.

Let anybody who still thinks the electric railways are going to the demnition bow-wows remember that the receiver at St. Louis has piled up $4,000,000 in cash and that in Kansas City an annual deficit of $1,500,000 has been turned into a net of more than half a million. The Louisville Railway is back on a dividend-paying basis and the Brooklyn-Manhattan Transit Corporation began preferred dividend payments less than a year after its reorganization.

These are particularly juicy morsels, but they are fairly typical just the same. The Denver valuation was fixed at $23,514,769 and an 8-cent fare authorized. This is a heartening instance that fair play is assured. The special master's findings were questioned in the Denver case, but the court did not depart far from them. Along the lines of improvement in the industry, substantially better results were reported in New York City. The combined results there for the year ended June 30, 1923, show a surplus for the first time in five years; 2,577,912,855 cash fares were paid. The traffic in the city was 439 rides per capita. Invested in the rapid transit lines of New York is the vast sum of $479,000,000.

Another important development was the one in which the New York commission held that a fare advance was the only answer to the New York & Queens County Railway situation where the company was operating at a 5-cent fare and burdened with a $250,000 paving expense. In this decision the commission recognized the basic fact that, regardless of politics and politicians, the public cannot continue indefinitely to get something for nothing. Permission was granted to charge 6 cents with 1 cent additional for each $100,000 paving assessment against the company.

MUCH FROM LITTLE

It has been very largely a case of *multum in parvo* with the electric railways in recent years. Just how much can be done with little is shown in most of the cases in the competi-

tion for the Coffin prize, won in 1924 by the Northern Texas Traction Company. This award is made to the electric railway which during the year has made the greatest contribution toward increasing the advantages of electric transportation for the convenience and well being of the public and for the benefit of the industry.

P. L. Thomson, publicity manager of the Western Electric Company, is of the opinion that "It's your own fault" if the railways are not better sold to the public. Mr. Thomson said that he could not attempt to set up a figure that would express the ratio the advertising appropriation ought to be to the gross revenue, but that railway men ought to spend enough to do the job. Three hundred street railways spent $2,000,000 last year in public relations activity. It will be more this year. He said that when a railway sets apart as one of the major objectives of its business the building of sound public relations, the executive officer in charge ought to be at least a vice-president and he ought to have competent assistants and an adequate appropriation. Similarly, Bill Strandborg of the Portland Electric Power Company, speaking before the Inland Daily Press Association, said that the way for the utilities to tell their story was to buy more space in the advertising section of the newspaper, not to beg space in the news columns.

H. G. Taylor, president of the National Association of Public Utility Commissioners and a member of the Nebraska State Railway Commission, said that anything is possible when we have to do it. Mr. Taylor said that the working of economic laws, superior efficiency in the use of the streets, intelligent sales efforts, and good use of publicity is bringing the electric railways back into their own.

OTHER CONTRIBUTIONS BY MR. WICKWIRE

One of the best contributions to this subject was the paper "Friendlyizing the Public," read by E. F. Wickwire, vice-president of the Ohio Brass Company, before the Southwest Association in April. This was a typical Wickwire contribution. Mr. Wickwire said that the utilities would be poor picking for pilferers if all directly interested would do their part. In a similarly striking way, Mr. Wickwire drove home the importance of public relations work and showed how to pursue it in addresses before the new Metropolitan Community Section of A.E.R.A., New York, and before the Midwest Electric Railway Association. In April Traction Tom, a new figure in the electric railway industry, was introduced as the outgrowth of the poster series called "The Man Behind the Electric Railways." Traction Tom, speaking for the 500,000 workers in the United States who draw pay directly or indirectly from the electric railways, has given out some homely advice.

Early in the year the Pittsburgh Railways ushered in its commercial and research department, sponsored by Thomas Fitzgerald and headed by W. H. Boyce as commercial manager. New cars have been ordered for Pittsburgh, but immediate action toward bettering public relations was begun by changing fares and improving service conditions. Later Mr. Boyce told what may be accomplished by constructive publicity. As Bill indicated, even if it is street railway publicity, it is in direct competition with the advertising of Rears-Sawbuck, the United States Mail, the Well Belephone Company, jitneys, freight and passenger buses, trucks, about fourteen million autos and Fords and the Shoe leather express. Pittsburgh has put on the Sunday pass with good effect. The "Shop Between Ten and Four" signs distributed through the association have helped to remove some of the terrors of the holiday season. By keeping everlastingly at it, railway men may eventually be able to make meaningless the lines:

The melancholy days have come
The saddest of the year
The Christmas shopping women folks
Begin to reappear.

In New York the Third Avenue Railway has installed its own radio broadcasting station WEBJ. On the air Slaughter Huff, president of the company, had been known to follow Mayor Hylan speaking from WNYC. It is the battle of the air or

From Slaughter Huff to Singhi Breen
From president to singing queen
The Mayor may gulp and at times be rough
But he doesn't bother Slaughter Huff

Or G. M. Dahl for that matter.

Edward Dana of the Boston Elevated has used the radio to good advantage during the year. In Detroit it is being used to call emergency crews.

Traffic is being speeded up in downtown St. Louis by the enforcement of recent ordinances. Signs installed in the cars of the Pittsburgh Railways tell strangers how to reach their destination by railway. The Tri-City Railway put into effect a rerouting scheme.

It's a courtesy desk now on the Chicago Surface Lines, not a complaint desk. The change was suggested by the official who reads the letters received daily from passengers. He found that a constantly increasing number of them began "I wish to commend." The honor system of fare collections has speeded up passenger movement on the Beaver Valley Line and bettered public relations. Freight and passenger cars of the Indiana, Columbus & Eastern Traction Company and the Columbus, Newark & Zanesville Electric Railway have been converted into moving billboards. Cars similarly painted are being run by the Northern Ohio Traction & Light Company. Unusual terminal layout facilities at Salt Lake City on the lines of the Bamberger Electric Railroad and the Salt Lake & Utah Railroad are builders of good will. Passenger comfort is a feature of the new Chicago Rapid Transit Company cars, discussed in detail in the issue of the JOURNAL for Jan. 12. As Britton I. Budd, then president of the American Electric Railway Association and head of the Chicago Elevated, said on "Modernization," in the annual convention number:

"Public good will is the key to successful operation of a utility company. Good service is the basis of public good will."

Many of those who spoke during the year about public relations properly stressed the importance of the attitude of the employee as a point of contact. He needs all the tact of the fellow with the red nose who suggested a way out in a dispute between two ladies over the car window.

"If this window is open," one declared, "I shall catch cold and probably die."

"If the window is shut," said the other, "I shall certainly suffocate."

The two glanced at each other. Then the man with the red nose said:

"First, open the window, conductor. That will kill one. Next, shut it. That will kill the other. Then we can have peace."

Members of the New England Street Railway Club discussed employee relations at the meeting held in Boston in December. The Nashville Railway & Light Com-

pany has scored a reduction of 25 per cent in the number of accidents since its adoption of the plan whereby trainmen profit by accident reduction. In Birmingham bonus awards and distinguished service buttons have resulted in more careful operation and fewer accidents. The Virginia Railway & Power Company was another to adopt an arrangement of this kind last year.

The subject "Modernizing Employment Methods" was discussed by Dr. A. J. Snow, in the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 13. His talk was based on experience on many different lines of industry. He said that general interviews and general examinations do not give any indication of the probable reaction of a man when operating vehicles under traffic conditions. Similarly, with respect to bus operation, R. N. Graham, manager of railways of the Pennsylvania-Ohio Electric Company, said care in selecting drivers is better than education after employment.

Trainmen are not the only employees that need to be coached. W. A. Holden, superintendent of transportation of the San Antonio Public Service Company, speaking before the Southwestern Association in April, said that the supervisory force, particularly inspectors, needed to be trained. They can do more than most anybody else to improve the service. Andrew L. McDonald, member of the Wisconsin Railroad Commission, speaking before the Wisconsin Association, said that trainmen cannot make up for defects in service for which the management is responsible.

S. F. Fannon, director of the department of public service of Sherman Service, Inc., said that maintaining street railway personnel depended on explaining the company's purpose to employees and the relation of the individual to the railway.

The Cleveland men were granted a 12-cent advance by an arbitration award made in June, but the company said that the finding was not fair because of prejudice on the part of one of the members of the board. In December the men voted down an offer made by President Stanley as a means of settling all differences between the company and the union. He wanted a 5-year contract on a 60-63-65 cent basis with the present differentials. There the matter stood on Dec. 31. The Detroit Municipal Railway last May decided not to deal with the union and this matter is still before the courts for adjudication. A three-day strike in Pittsburgh was terminated on May 12 when trainmen accepted the present wage scale for two years. Four hundred miles of I. T. S. Interurban were tied up six days in December. The company accepted the closed shop, but there will be no hourly wage increase. Some of the Buffalo labor dynamiters were sent to the cooler, but the last has not yet been heard about the fate of these miscreants. Arbitrations have favored neither party, as pointed out in the compilation of arbitrations during the last five years.

INTERURBANS ARE MODERNIZING

The Interstate Public Service Company placed sleeping cars in service between Indianapolis and Louisville this fall, and the same company made rider comfort the feature of the new interurban car which it developed for intercity traffic. Similarly, a parlor car and coach built by the Milwaukee Electric Railway & Light Company have many features typical of steam railroad practice. The demand for a de luxe service has also increased in Michigan so that the Detroit United Railway has added chair cars to several of its interurban lines. And the Northern Ohio Traction & Light Company and the I. T. S. have given increased attention to the matter of passenger comfort.

The progress made in handling interurban freight in 1923 was discussed by T. H. Stoffel of the railway department of the Westinghouse Electric & Manufacturing Company early in the year. He said that in three central states material additions had been made to net revenue by handling freight. In those states alone more than 1,000 cars are now in use and loadings approximate 500 carloads. The new Indianapolis freight terminal was opened last fall. This is the largest terminal of its kind in the world. The Indianapolis & Cincinnati Traction line was changed from a.c. to d.c. and generally rehabilitated as a step looking toward extension of the line some 60 miles to reach Cincinnati.

There was "Jolla-fication" at the completion of the San Diego Electric Railway extension and the opening of the 14-mile high-speed line to Ocean Beach last July. The Chicago, North Shore & Milwaukee Railroad reported its best year in 1923. The Toledo & Western Railroad was sold to the Willys-Overland Automobile Company and the Wabash Railroad. This marked the entrance of another motor manufacturer into the field of railroading.

C. W. Snyder, vice-president of the Illinois Power & Light Corporation, appears to have summarized the interurban situation in his paper last November before the Midwest Association. He said that the interurban must introduce new services and new selling. He said that the passing out of some of the smaller and weaker roads had created a false impression about the status of the electric railway. He attributed these failures to the natural reaction from a boom building period in which some roads were built that were not justified by density of population or conditions of competition.

BUS DEVELOPMENT GOING ON APACE

All of which leads to the subject of the bus. J. A. Emery of Ford, Bacon & Davis said early in the year that co-ordinated service between trolley and bus was possible and then proceeded to prove it. Later in the year John A. Beeler contrasted coach and bus operation in New York as conducted by the Fifth Avenue Coach Company and by the buses under municipal supervision. Before the New York Electric Railway Association at Long Beach in June L. H. Palmer, general manager of the United Railways & Electric Company, Baltimore, told about the operation of the bus there as an auxiliary covering more than 5 years. The spheres of motor and railway transport were discussed at the New England conference in December. Among the electric railway men who participated with papers were W. J. Flickinger, assistant to the president the Connecticut Company; Edward Dana, general manager Boston Elevated Railway, and L. S. Storrs, president the Connecticut Company. At that meeting the expression *Cave Canem* was resurrected by Mr. Dana. His translation of this was "Beware of the Dog." He offered this motto for consideration of the bus men as the inscription over the door of the electric railway: "Beware of the bus-mile statistics."

With Mr. Dana it has evidently been a case of:

My auto, 'tis of thee
Short cut to poverty—
Of thee I chant.

But they are all doing it. Earlier in the year F. E. Belleville, auditor of the Louisville Railway, sang a

pæan about the results of bus operation there. As for operating experience with buses, B. Hilburn, general manager of the Tulsa Street Railway, pointed out various sources of trouble in his paper before the Midwest Association in November. The Twin City Rapid Transit Company bought out its motor competitors. The United Railways, St. Louis, likewise took the bull by the horns, as it were, and entered the bus field in competition with the People's Motor Bus Company. The largest bus operator among railways is the Public Service Railway with 593 buses.

The Detroit United bought some rural bus lines. It will also operate to downtown Detroit by bus instead of bringing its interurbans into the city. Similarly the Hartford & Springfield Street Railway turned the bus to advantage. Rochester went in for a trackless trolley, as did Cohoes and one or two other places. But Rochester did even more —it established de luxe bus service on a suburban run. Buses are even being run along the historic Paul Revere route. The Department of Street Railways of Detroit developed a new double-deck bus and is running emergency bus lines as a municipal enterprise. The bus was made an ally in Decatur. In Pennsylvania the Pennsylvania-Ohio Electric Company has paralleled its interurban line with buses as a means of providing de luxe service. As a matter of fact, buses are now carrying one-quarter of the total number of passengers in Youngstown. There bus service supplements the city service by furnishing transportation facilities to the recently developed sections.

Both the Los Angeles Motor Bus Company, subsidiary of the Los Angeles Railway Corporation, and the Pacific Electric Railway ordered more double-deck buses during the year and expanded their bus services. The Michigan Railroad joined with the bus so as to increase freight and passenger facilities. Bus talk was started in Cleveland last March and wound up in the hearing at Columbus in December, at which some harsh words were passed. There has also been a lot of loose bus talk in New York. In fact, there were so many applicants for bus rights in New York at one time that track of them was lost. One count showed 51 applicants. New York's merchants, however, are not impressed with the idle talk on the part of the Mayor of taking the cars off both 42d and 125th Streets and replacing them with buses.

200 Buses for Philadelphia

By far the biggest bus order of the year is the one placed by the Philadelphia Rapid Transit Company for 200 gasoline-electric vehicles. In a lecture under the Cyrus Fogg Bracket Foundation to the students of the Green Engineering School of Princeton University, President Thomas N. McCarter of the Public Service Railway said that the electric railway and bus in co-ordination can furnish the people of this country with local transportation fitted to public needs, and the transportation system of the future will be a combination of cars and buses under the same management, each occupying the field to which it is best suited. A similar plea was made by President Shannahan of the American Electric Railway Association before the National Association of Railway & Utility Commissioners at Phoenix in November. He wants legislation which will set the motor vehicle in its proper place, on its own account and in relation to other means of transportation, as a common carrier, and on a footing with street car transportation in so far as franchises, penalties and restrictions are concerned. Co-ordination was the subject of a series of papers at the convention in Atlantic City.

Jitneys a Poor Stick for Support

In a number of cases the politicians have found the bus to be a convenient plaything. Mayor Hylan has, of course, been spouting the cause of the bus all through the year. Mayor Rybolt of Akron stole a note from the ideas of Mayor Hylan, but with disastrous results. Service was suspended in Akron on Feb. 1. The local cars were withdrawn at the expiration of the franchise following the refusal of city officials to grant a fare increase pending negotiations of the new operating contract. As the JOURNAL said at the time, Akron's ride on rubber was not resilient. The cars went back on Feb. 28. Following the suspension of railway service in Akron, the jitney men promptly appealed to the city for permission to charge a 7-cent fare, saying that they could not make expenses at 5 cents.

The jitneys were defeated at the election held on April 29 in Youngstown, Ohio. At that time the so-called jitney referendum ordinance initiated by the jitney operators was voted down. Jitneys were made a political issue at Springfield, Mass., and counsel for the jitney men ran for Mayor on an avowed platform providing for their return. He was defeated. The jitney was also an issue in the election at Springfield, Ill., on Nov. 2, but there a new railway franchise for 20 years was awarded to the Springfield Power Company under which service will be co-ordinated. There was a five-day service suspension in Port Huron, Mich., by the City Electric Railway, a subsidiary of the Detroit United Railway, in which the residents rode buses at a 10-cent fare while the City Commissioners made up their minds to accept the railway's proposal. At the election on Sept. 9 the voters confirmed the good judgment of the City Commissioners. The choice before them was: Do you prefer one-man car operation at 5 cents or two-man operation at 7 cents? The jitney ordinance of Detroit was declared unconstitutional. In this instance the court made permanent the injunction restraining the city and its officers from enforcing the ordinance. The court opinion stated that the ordinance was unreasonable from the viewpoint of public demand and general welfare in excluding jitneys from the main streets and allowing other forms of transportation to use them, and that it was not a regulation but a prohibition of jitney service which is inconsistent in view of the license granted by the ordinance. The Detroit lines were not required to retire, but out in Oakland "Rosalie" retired. Rosalie was the bus put on by the city of Oakland. She was incarcerated in the police garage to await further developments in Oakland. The retirement of "Rosalie" was forced by the refusal of the city auditor to pay the bill for her.

Expansion of the San Francisco Municipal System put the railway behind $317,929 for the year. Seattle flirted with the 5-cent fare with the result that the net income was $600,000 less than for the previous year. Chairman Jackson of the Board of Public Trustees in charge of the Boston Elevated believes the railway will go from public control to public ownership. Boston's Mayor welcomes this suggestion. The finding of the board of arbitrators, appointed in accordance with the purchase contract between the city of Detroit and the Detroit United Railway, when the city took

over the Detroit United lines, was a most important finding.

Heavy electric traction was the subject of a discussion at the mid-winter convention of the American Institute of Electrical Engineers held in Philadelphia on Feb. 5. It was also a subject at the A. S. M. E. meeting in June. Again at the A. R. A. meeting in July the problems of heavy traction held a prominent place. In June the New Haven Railroad started 100 per cent electric operation between New York and New Haven, the use of steam engines being eliminated in the electrified zone. The Pennsylvania made a decision to equip its Fort Washington branch for single-phase operation. Mr. Ford's locomotives for use on his Detroit & Ironton Railroad are coming on. The Staten Island lines are being electrified.

MUCH DIRT, BUT NO DIGGING

Akin to heavy electric traction is rapid transit operation in cities. At the election in Detroit on Sept. 9 the voters approved a charter amendment providing for a system of rapid transit lines. A combination tube and subway is planned to connect San Francisco and Alameda. Hylan has a subway plan for New York to cost $400,000,000, but in the meantime he has spurned all overtures made by the Transit Commission looking toward even the completion of lines authorized in 1913. Plans have also been advanced during the year by Daniel L. Turner for a New York suburban transit system by which railway trains would run into New York through a union terminal distributing system, to be entirely independent of the city systems. Another Hylan idea is for a four-track trunk line to be built on Sixth Avenue to replace the "L" now there. There has been much dirt but no digging in New York. A wag who wrote to the Transit Commission expressed the situation thus:

For seven long years Hylan's dinned in our ears
What he'd do if he ever got going,
But the subways we'd get are not started yet
In spite of the "dirt" he's been throwing.

At the hearing on Dec. 24 before Judge McAvoy on transit matters Mayor Hylan complained that he was being made defendant instead of prosecuting witness.

The question of rapid transit for Chicago has been reopened by proposals from the railways considered by Mayor Dever, Mr. Blair, Mr. Insull and other officers of the companies there. Super-highways are proposed for Detroit with four-track rapid transit lines underneath them. Hollywood is to be made accessible to Los Angeles through a tunnel to be built at an outlay of $3,800,000 by the Pacific Electric Railway. Perhaps the Pacific Electric Railway will be able to lay out the subway for moving picture purposes. The year 1923 saw "Conductor 1492" in the movies and the subject of a JOURNAL editorial, "Caught Underground," may yet be enacted. John A. Beeler wants Atlanta to put in a moving sidewalk.

Even without rapid transit lines street car traffic is being speeded up. A gain of 1.85 m.p.h. in the downtown district of Detroit has been obtained largely through anti-parking regulations. At the same time accidents have been reduced. Chicago's Loop rerouting was planned so as to increase the capacity for cars 30 per cent. Parking rules were suggested by the New York State Conference of Mayors to fix drastic limits on trolley-traveled streets. Street congestion was one of the topics at the meeting of the Mid-West Association in November. Substitution of the bus for the trolley would add to traffic congestion, said John A. Miller, Jr., associate editor of the JOURNAL, in discussing a paper presented before the A. S. C. E. Along the lines of public safety, rules for pedestrians and changes of car routes were proposed in the traffic report presented in Baltimore. The Mayor's commission there recommended strict anti-parking regulations within the central business district. J. Rowland Bibbins told in the JOURNAL for Feb. 23 how the work of solving the traffic problem was being organized in some cities and gave some of the results. He said that a broader viewpoint of the whole problem was necessary. The greatest need is for leadership and the railway should supply it.

The biggest thing of the year done in the interest of relief of street and highway accidents was the national conference called by Secretary of Commerce Hoover. This conference outlined a comprehensive and constructive set of rules and regulations for guidance of all interested parties.

The doctrine of "Modernize and Merchandise" is certainly bearing fruit. Details of some of the advances that have been made have already been noted. Although, as the JOURNAL pointed out last March, 40 per cent of the machine tools in use in electric railway shops were 20 years old and only 28 per cent of all machine tools now in use have been purchased in the last 10 years, during the year some progress was noted in correcting this condition.

The new Everett shops at Boston have paved the way to maintenance economy. The Interborough has completed a new inspection shed at 180th Street, New York. New buildings are to replace the carhouse destroyed by fire last July at Grand Rapids. Detroit has recently completed new shops for its municipal line. At Toronto there are 5 acres of shop under one roof to care for cars of the municipal railway. This building is the principal one of a group so designed as to involve the minimum movement of equipment, materials and men. The arrangement provides for about 1,800 cars, including all branches of work necessary for overhauling and painting. Fort Wayne has a new carhouse.

FOREIGN OPERATION STUDIED

Forty-seven pages of the issue of the JOURNAL for Sept. 20 were given over to the report of the committee on foreign operation, made up of James W. Welsh, Harley A. Johnson and Harry L. Brown. It was a prodigious task which these men carried out. Their itinerary and the report which they presented prove this. Not only are the results of the study which the members of this committee made available in the JOURNAL, but the findings have been reprinted in pamphlet form. Aside from the elaborate report on foreign practice the JOURNAL covered at length the sessions in Paris in June and in Homburg in September of the two principal European electric railway associations and published most of the papers and reports presented at these meetings. Nearly every week "Foreign News" appeared in the department "The News of the Industry."

Reference to the report of the committee that went abroad and to the convention at Atlantic City and the exhibits was purposely left to the last. In news reporting the big event comes first, but in a review there is little need to draw attention to things that have made such a big impression themselves that they can't possibly escape attention. It is very much like the case of the fellow who was asked if he knew that the 'Steenth National Bank had busted. "Yes," he said, "I heard the report."

Heavy Traction Has Quiet Year

Progress Is Being Made on Projects Already Started, but Little New Work Is Decided On—New Type of Single-Phase Locomotives Planned

CONDITIONS in the field of heavy electric traction have changed comparatively little during the past year. The outstanding event of the year probably was the electrification meeting of the American Institute of Electrical Engineers held at Philadelphia in February. Operating men from the principal steam railroads having electric divisions, and some few from other roads, expressed their views of what is to be expected from electric operation if it is to become interesting to the trunk lines. The discussion brought out that on the electrified division of the Norfolk & Western Railway extremely heavy freight trains are hauled by electric locomotives with an 8 per cent operating saving over steam for doing the same amount of work. Moreover, the electric locomotives can haul trains at twice the speed of the steam engines and are available for service for 85 per cent of the time as compared with 50 per cent of the time for steam engines. There is a fuel saving of 12 per cent over steam, and with favorable conditions it is estimated that the fuel saving should run as high as 25 to 30 per cent.

In connection with the A.I.E.E. meeting, the Pennsylvania Railroad had an interesting exhibit of its heaviest types of motive power, both steam and electric. It is interesting to note that what is said to be the heaviest locomotive in the world for freight service is an electric engine, weighing 250 tons and having a rating of 4,800 hp. This machine operates on the single-phase system at 11,000 volts.

MOTOR-GENERATOR LOCOMOTIVES FOR SINGLE-PHASE LINES A RADICAL DEPARTURE

A somewhat revolutionary announcement during the year was that of the New York, New Haven & Hartford Railroad that it has ordered seven electric locomotives of an entirely new type from the General Electric Company. These locomotives will operate on the railway's 11,000-volt, single-phase system, but, unlike the other locomotives of the New Haven, they will have motor-generator conversion equipment to change the alternating to direct current for use in d.c. traction motors. While the plan is patterned after the Ward-Leonard system brought out 30 years ago, this is one of the first installations where it is employed in actual service on a large scale.

The New Haven announcement followed only a short time after the statement that the electric locomotives for Henry Ford's road, the Detroit & Ironton, will use locomotives of nearly similar electrical characteristics to those ordered for the New Haven, although the contact line will be at 22,000 volts on the Detroit & Ironton. These locomotives will be designed by Mr. Ford's engineers and will represent his ideas. The electrical equipment will be furnished by the Westinghouse Electric & Manufacturing Company. Thus both leading electrical manufacturers are constructing locomotives of a new type different from anything else in America, but which will be quite similar electrically.

The New Haven and Ford announcements indicate that the railroad men and the manufacturers are taking a more liberal attitude than they have for a number of years past. While it will be some time before service records of these new locomotives will be available for comparison, it seems that the situation is now clearing up. Consequently a considerable impetus should be given to the cause of electrification.

During the year the New Haven road inaugurated 100 per cent electric operation of all freight and passenger trains on its main line between New York and New Haven. While this line has been electrically operated for several years, until last year there never was sufficient power to permit full electric operation, and steam was used for certain passenger and freight trains.

CONSTRUCTION WORK ON SEVERAL ELECTRIFICATIONS IS PROGRESSING

The Long Island Railroad began work on its Jamaica-Babylon electrification during the year. This project comprises 28 miles of line and will cost $4,000,000. It will convert one of the largest remaining sections of the system to electric operation. It permits the road to run through passenger trains between Babylon and the Pennsylvania station in New York, or Flatbush Avenue in Brooklyn, thereby eliminating the transfer of passengers at Jamaica.

The Pennsylvania Railroad extended its 11,000-volt, single-phase electrification in the Philadelphia suburban zone by converting the Fort Washington branch to electric service. This is a 6-mile line connecting with the Chestnut Hill branch.

Construction is progressing on the electrification of the Staten Island Rapid Transit lines, with some 40 miles of track. These lines eventually will be connected with the rapid transit system of New York City to give the Borough of Richmond a high-class suburban service.

Work on the electrification of the Virginian Railway has progressed during the year, and it is expected that the road will be opened for electric service during 1925. The Illinois Central suburban electrification at Chicago also is proceeding according to plans announced a year ago.

An electrification of an entirely different kind inaugurated during the year was that of the Missouri-Kansas-Texas Railroad between Dallas and Denton, Tex. This line has been equipped with an overhead trolley and the necessary 600-volt d.c. power supply. It is planned to operate passenger service in the same manner as on light interurban roads, and with light one-man cars. Through passenger and freight service will still be given by steam trains. In this way the advantages of the ordinary interurban will be obtained without the duplication of track and consequent destructive competition.

In Europe greater progress is being made in electric traction than in this country. The Swiss Federal Railways will be completely electrified in the near future. The decision to make the change is based on economic reasons, the price of coal being high while water power is cheap. The Paris-Lyons-Mediterranean Railway in France is following through an extensive electrification program that involves most of its lines in southern France. Here, too, much of the power will be supplied with hydro-electric stations.

The Southern Railway of England, which includes a number of the suburban lines operating out of London, is proceeding with its electrification, having increased the electrified route-miles from 85 to 145 and the track-miles from 248 to 358.

Electric Railway Costs and Fares in 1924

Trend Figures Indicate a Closer Approach to Stabilization—Recession in General Construction Costs and Cost of Railway Operating Materials—Advances in Railway Wages and Fares—Discussion of Trend of Operating Costs

By Albert S. Richey
Electric Railway Engineer, Worcester, Massachusetts

WITH this issue the ELECTRIC RAILWAY JOURNAL again presents a chart and tabulation showing the trends since 1913 of five index numbers which are of some interest to electric railway operators and investors. These five indexes, of wholesale commodity prices, general construction costs, street railway operating material costs, street railway wages and street railway fares, are each on the base of 1913 = 100, and are among the twelve which comprise the Conspectus of Indexes compiled monthly by the writer and published regularly in the Financial and Corporate section of this paper. Similar charts were published in the Annual Statistical Numbers dated Jan. 6, 1923, and Jan. 5, 1924. In the current presentation the indexes have been revised and brought down to date. The average indexes for the years 1913 to 1920 inclusive, are shown in the table, with the monthly indexes from January, 1920, to date. Monthly indexes for the earlier years are included in the table in the 1924 Statistical Issue of the JOURNAL.

The methods of obtaining these indexes were described in the article accompanying the chart in the Jan. 6, 1923, issue, and these methods are still followed with one exception, that of the wage index. As noted on page 787 of the ELECTRIC RAILWAY JOURNAL for Nov. 1, 1924, the wage index has been revised by a change in the weighting used. Formerly, the maximum hourly wages of the platform men on about 100 of the larger roads of the country were weighted according to the number of passenger cars operated by the various companies. The revised index, as shown here, uses for weighting purposes the number of platform men employed, and is thus a more accurate indication of the trend of the average platform man's hourly rate of wage. The difference between the former and the revised index is very slight, owing to the necessarily fairly close relationship between the number of cars and the number of men on roads operating 100 or more cars.

In the JOURNAL'S 1924 Statistical Issue, it was stated that these indexes then indicated that electric railway costs were approaching stabilization, at least to the extent that an end could be seen to the period of rapid and large fluctuations in labor and material prices. Especially as compared with the several years preceding 1923, that statement is borne out with reference to 1924, although the year just past shows a trend which is downward in two of the indexes and slightly upward in two others. Apparently we should not yet risk any very definite prophecies with respect to the future general trend of these costs and prices.

Wholesale prices of all commodities combined, as shown by the Index of the U. S. Bureau of Labor Statistics, fluctuated less during 1924 than in the preceding year, and ended the year at almost the same level as it entered. In 1923 the maximum of this index was 159 and the minimum 150, as against 152.7 and 144.6, respectively, for 1924. These are small fluctuations compared with the rapid drop of more than 100 points from 247, the peak in May, 1920, to 145 a year later in May, 1921, or as compared with the rise of 17 points from the post-war minimum of 138 in January, 1922, to 155, six months later in July of the same year. Within the last 18 months this authoritative index of the general commodity price level has moved less than six points above or below 150, or 50 per cent above the 1913 or pre-war level. Many students of the subject have ventured to call this the stabilization point, and the experience of the year 1924 tends to confirm that opinion.

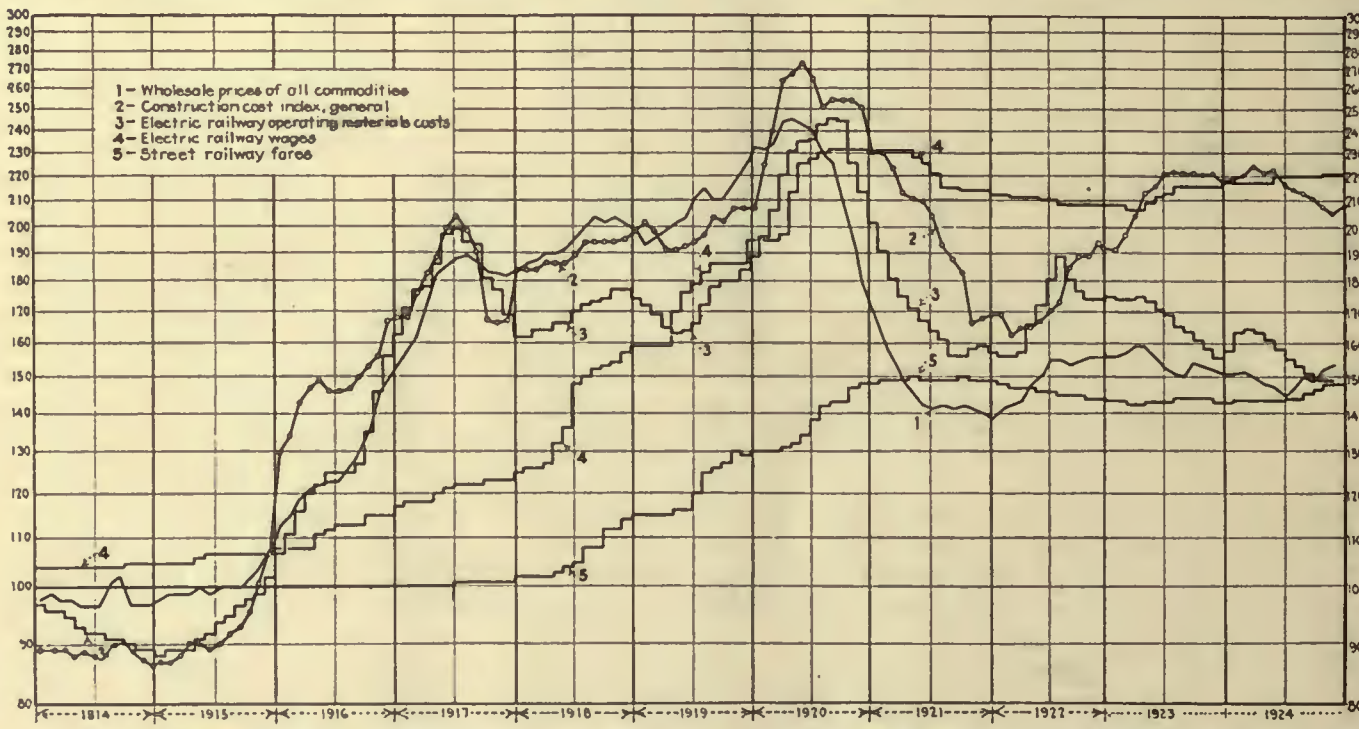
The general Construction Cost Index of the *Engineering News-Record* remained almost stationary near 220 for a year from June, 1923, through May, 1924. This was about the midpoint between the peak maximum of 273.80 in June, 1920, and the post-war minimum of 162.04 in March, 1922. After May, 1924, however, this index showed a continuing drop, reaching a minimum of 205.70 on Nov. 1, but increasing to 208.58 on Dec. 1.

The Street Railway Operating Materials Cost Index, which showed a drop of twenty points, or more than 11 per cent, in 1923, came through 1924 with a total fluctuation of less than sixteen points, or about 10 per cent, and a further net drop of seven points, or less than 5 per cent. It reached its low point since the war, 148.5, in October, standing a little lower than the general commodity price level, where it is possible it may establish itself for some time to come. This index is not one of construction costs, but is intended to apply to materials used in electric railway maintenance and operation. It does not include any labor costs which make up so large a part of the first cost of railway construction. The index does include fuel cost, at a weighting of 40 per cent of the total. While many railways purchase power, most power contracts include a coal clause which varies the price of power with the cost of coal, and it is for this reason that the cost of fuel for power is included in the index, which may therefore be taken as an index of the cost of operating materials including power cost, when the latter is purchased under a coal clause. The remaining 60 per cent of the weighting of the materials index is made up of the costs of metals, metal products, lumber and building materials. The weighting of these individual items was determined upon after a careful study of the cost of materials used by a number of railway companies in various parts of the country over a period of years.

The Index of Street Railway Wages, weighted as described above, has been rising steadily since its post-war low of 206.8 in March, 1923, reaching 216.4 at the end of 1923 and 220.8 at the end of 1924. The gain during 1924 was due in a large measure to wage increases in Massachusetts, Connecticut, Rhode Island, Chicago, Philadelphia and Buffalo. As those companies employ nearly 25 per cent of the trainmen represented

in the weighting of the index, it is not suprising that increases of from 2 to 10 cents per hour in those few companies should cause a rise of 2 per cent in the wage index. With but few exceptions other than those noted above, street railway wage contracts were renewed during 1924 at rates the same as or lower than the 1923 scales.

The Street Railway Fares Index has increased somewhat during the past year, with very few individual fare decreases, and some more or less important increases, including Baltimore, Indianapolis, Cincinnati, Des Moines, Springfield, Mass., Boston and Akron. The net change in the Richey Index was from 142.4 to 148.1, or an increase of about 4 per cent. The multiplying factor between the Richey Fare Index and the average fare in cents being 0.048425, it will be noted that the average city fare increased during the year from 6.89 cents to 7.17 cents. Here again it should be remembered that this index is not a simple average, but that it is weighted in accordance with the population of the various cities included. Those cities include all in the country of 50,000 population or more, except New York City. The fares used are, as nearly as it is possible to determine them, the average in the various cities, including cash and regular ticket or token fares. Ticket or token rates used are those available to all riders at all times of the day; pupils', workmen's or other special forms of tickets are not included. Pass and transfer riders are not included in arriving at the averages, but where a charge is made for a transfer such charge and



	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Construction Costs (*Eng. News-Rec.*)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)
1913	100	100	100	100	100
1914	98	88.6	93	104	100
1915	101	92.6	94	106	100.1
1916	127	147.4	126	112	100.1
1917	177	181.2	182	121	100.5
1918	194	189.2	169	140	106.2
1919	206	198.4	172	174	120.7
1920	226	251.3	225	217	137.2
1920					
January	233	206.6	189	195	129.9
February	232	225.1	196	195	129 9
March	234	240.9	207	195	130.2
April	245	265.2	221	197	131.1
May	247	268.9	232	213	131.9
June	243	273.8	236	226	134.0
July	241	265.7	237	228	138.0
August	231	252.0	243	231	141.5
September	226	255.2	247	232	142.6
October	211	255.2	245	232	143.3
November	196	255.3	227	232	147.0
December	179	251.6	213	232	147.5
1921					
January	170	230.9	202	231.5	148.2
February	160	230.7	191	231.4	148.6
March	155	224.3	181	231.4	148.9
April	148	213.1	175	231.3	149.1
May	145	210.8	171	228.2	149.6
June	142	209.8	167	224.6	148.9
July	141	203.8	164	221.3	149.0
August	142	193.1	161	215.5	148.7
September	141	188.3	156	215.1	148.9
October	142	182.6	156	214.3	149.6
November	141	166.3	158	214.2	148.9
December	140	167.8	159	214.0	148.6

	Wholesale Prices, All Commodities (U. S. Bur. Lab. Stat.)	Construction Costs (*Eng. News-Rec.*)	Elec. Ry. Operating Materials Costs (Richey)	Elec. Railway Wages (Richey)	Street Railway Fares (Richey)
1922					
January	138	168.7	157	212.6	148.6
February	141	168.7	156	212.6	147.8
March	142	162.0	156	211.9	147.4
April	143	164.7	157	211.9	147.4
May	148	164.6	166	211.5	147.4
June	150	166.6	172	210.8	145.5
July	155	169.7	181	210.2	145.5
August	155	173.4	189	208.3	144.9
September	153	185.0	181	207.8	144.8
October	154	188.6	177	207.8	144.6
November	156	188.6	174	207.5	144.1
December	156	192.6	174	207.7	143.7
1923					
January	156	191.7	175	207.1	143.4
February	157	197.4	174	207.1	143.4
March	159	205.3	174	206.8	142.4
April	159	213.5	175	207.0	142.3
May	156	216.7	173	209.0	142.1
June	153	220.7	171	212.6	142.9
July	151	222.1	169	213.5	142.9
August	150	221.5	165	216.2	142.9
September	154	221.5	163	216.4	143.4
October	153	220.3	161	216.4	143.5
November	152	220.9	158	216.4	143.5
December	151	217.3	156	216.4	142.4
1924					
January	151	217.9	158	217.4	142.6
February	152	220.3	163	217.4	143.1
March	150	224.7	164	217.5	143.1
April	148	221.6	163	217.7	143.2
May	147	222.4	161	217.8	143.5
June	145	216.8	158	220.0	143.8
July	147	214.4	155	220.0	144.2
August	150	213.2	153	220.0	144.3
September	149	211.2	151	220.1	146.2
October	152	207.6	149	220.6	147.6
November	153	205.7	149	220.7	148.0
December	..	208.6	...	220.8	148.1

the proportion of original riders paying it are considered in determining the average fare.

TREND OF OPERATING COSTS

In some instances the Richey indexes of operating material costs and of wages have been combined to arrive at a combined index of street railway operating expenses. To do this intelligently, the make-up of the two indexes must be kept in mind. The operating material cost index includes fuel for power; if power be purchased, the item of fuel does not appear in the operating costs as such, but as most power contracts include a coal clause varying the price of power with the cost of coal, the index containing coal costs is applicable to such cases as representing the trend of cost of operating materials plus power. The wage index is based on maximum hourly rates of platform men; if, as is generally the case, other employees' wages vary with those of the platform men, the index is applicable to all wages. A consideration must be made of the trend of that part of the operating expense which is neither wages nor material, such as salaries and other general office expense, advertising, accidents, etc. Sometimes the assumption is made that such "other" expense varies the same as wages and material combined. If a fair present distribution of operating expense is wages 62½ per cent, material 22½ per cent and other expense 15 per cent; if "other" expense varies as wages and material combined, and if the Richey indexes be taken as representative of the trends of wages and material costs, then the 1924 change in average street railway operating costs (exclusive of fixed charges) was as follows:

	Wages	Material	Operating Expense
Index at end of 1923.....	216.4	166.5	200.3
Index at end of 1924.....	220.8	148.7	201.6
Change during 1924.....	*2.0	†4.4	*0.7

*Per cent increase. †Per cent decrease.

Under the assumptions as above, average street railway operating expenses (not including fixed charges) in the United States at the end of 1923 were about double those of 1913; during 1924 they increased 1.3 points, or 0.7 per cent; the 4½ per cent decline in material costs was more than offset by the 2 per cent increase in labor costs.

All of the above is based on average conditions of the country as a whole; in individual sections or cities experience may show somewhat different results. It may be of some value, however, to compare individual experience with nation-wide trends and to determine the causes for such differences as may exist.

Track Extensions in 1924 Show Big Increase Over 1923

New Electric Railway Mileage Added During the Past Twelve Months Is Greater than for Many Years—Totals of Both City and Interurban Extensions Are Larger—Mileage of Track Rebuilt Is Approximately the Same as in Previous Years—Electrification of Steam Lines Has Continued

MORE miles of electric railway extensions than were made in any other one year since 1918 is the outstanding feature of track statistics for 1924. Approximately 312 miles of new electric railway track was built during the year. Of this amount about 75 per cent was city track and 25 per cent was interurban. In addition to this, 83.39 miles of steam railroad lines were electrified, making a total of nearly 400 miles of new electric trackage. The total of city and interurban extensions of electric railways, track rebuilt, and steam railroad lines electrified was greater than in any other of the last seven years.

At the same time, some 765 miles of track was reconstructed, 180 miles of this being on interurban lines and 585 miles in cities. This figure is slightly less than that for the year 1923, but is larger than that for any other past year. Figures showing the extent of track construction and reconstruction which was done by 243 different electric railway companies in the United States and Canada are given in the accompanying table.

A larger amount of new electric railway mileage was added in the Western states than in any other section of the country. In this district there were 39.098 miles of city extensions and 48.814 miles of interurban exten-

COMPARISON OF TRACK CONSTRUCTION BY YEARS

Year	No. of Companies	Extensions: Urban Track	Extensions: Interurban Track	Electrified Steam Lines	Total	Track Rebuilt
1907	(a)	(a)	(a)	.....	1,880.00	(a)
1908	157	1,174.5		84.00	1,258.50	(a)
1909	160	774.7		112.40	887.16	(a)
1910	217	1,204.8		192.40	1,397.20	(a)
1911	223	1,105.0		86.50	1,191.50	(a)
1912	171	869.4		80.80	950.20	(a)
1913	181	974.9		119.00	1,093.90	(a)
1914	163	716.5		229.00	946.40	(a)
1915	136	596.0		448.20	1,044.20	(a)
1916	104	115.40	240.90	388.00	744.30	(a)
1917	121	251.10	125.60	66.00	442.70	375.40
1918	80	216.41	97.41	275.70	589.53	155.43
1919	73	110.90	29.67	287.60	428.17	390.64
1920	87	145.69	30.87	8.92	185.48	361.77
1921	78	108.15	38.95	8.08	155.18	615.21
1922	104	126.27	85.11	12.35	223.73	739.70
1923	272	169.61	63.54	26.16	259.31	854.63
1924	243	218.085	93.988	83.39	395.463	764.323

(a) Information not available

SUMMARY OF TRACK CONSTRUCTION FOR 1924

	New England States	Eastern States	Central States	Southern States	Western States	Canada	Grand Total
Track extensions							
No. of companies..	10	18	33	10	27	14	112
Miles of urban track.....	11.386	30.191	59.526	14.508	39.098	63.376	218.085
Miles of interurban track.....	13.777	11.740	12.780	0.847	48.814	6.030	93.988
Total miles built	25.163	41.931	72.306	15.355	87.192	69.406	312.073
Track reconstruction							
No. of companies..	23	52	70	15	40	18	218
Miles of urban track.....	66.874	161.463	174.207	43.731	113.847	23.384	585.506
Miles of interurban track.....	18.827	16.370	90.662	1.000	37.348	14.610	178.817
Total miles rebuilt.....	85.701	177.833	264.869	44.731	153.195	37.994	764.323

sions, making a total of 87.912 miles. The central states rank second in point of extensions with 72.306 miles. Canada is not far behind, with 69.406 miles of new electric railway tracks. The Eastern, New England and Southern states then follow in the order named.

In extent of track reconstruction the Central states take first place by a wide margin, with 264.869 miles. Of this, 174.207 miles was city track and 90.662 miles interurban. The Eastern states are a close second in the amount of city track rebuilt, with 161.463 miles, but are far behind on interurban. All sections of the country reported extensive track reconstruction work during the year. In Canada, however, activity along the lines was somewhat less, as only 37.994 miles of track was reconstructed.

One of the most interesting track extensions made during 1924 was the construction of the new Mission Beach line by the San Diego Electric Railway, as described in the ELECTRIC RAILWAY JOURNAL, issue of June 14. This involved the addition of nearly 19 miles of track to the system. At the same time about 3 miles of city extensions were made, so that for new track built during 1924 the San Diego Electric Railway stands first among the companies in the country.

In Philadelphia the Philadelphia Rapid Transit Company added about 11 miles of new track to its system and the Detroit United Railways constructed an almost equal amount. Other important additions were those of

ELECTRIFIED STEAM LINES

	Extensions, Miles
Baltimore & Ohio R.R.	40.00
Norfolk & Western Ry.	7.83
Montreal & Southern Counties Ry.	1.30
New York Central R.R.	0.63
New York, New Haven & Hartford R.R.	0.15
Texas Interurban Ry.	33.48
Total	83.39

Track Built and Rebuilt During 1924

Name of Railway	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, Miles City	Rebuilt, Miles Interurban
Connecticut				
Connecticut Company	0.60	0.039	14.59	5.04
Danbury & Bethel St. Ry.	.....	.....	0.25	.....
Maine				
Androscoggin & Kennebec Ry.	.....	.....	6.00	.....
Bangor Ry. & Electric Co.	.....	.....	0.38	.....
Biddeford & Saco R.R.	.....	.....	0.51	.....
Cumberland County Pwr. & Lt. Co.	.....	.....	1.68	.....
Portland-Lewiston Interurban R.R.	.....	0.08	.....	.....
Massachusetts				
Berkshire St. Railway	.....	0.141	1.787	3.527
Boston Elevated Ry.	4.34	.....	17.00	.....
Eastern Mass. Street Ry.	0.61	.....	9.92	1.83
East Taunton St. Ry.	5.00	6.00	.....	.....
Holyoke St. Railway	.....	.....	0.90	.....
Massachusetts Northeastern St.Ry.	.....	.....	0.25	1.00
Middlesex & Boston St. Ry.	.....	.....	3.94	.....
Millford & Uxbridge St. Ry.	.....	.....	.....	5.00
Plymouth & Brockton St. Ry.	.....	.....	1.00	.....
Springfield St. Ry.	.....	0.017	0.19	1.82
Union Street Ry.	.....	.....	2.00	.....
Worcester Consolidated St. Ry.	0.49	.....	0.64	0.11
New Hampshire				
Berlin Street Railway	.....	.....	0.18	.....
Chester & Derry R.R.	.....	7.50	.....	.....
Laconia Street Railway	.....	.....	1.00	.....
Manchester Street Railway	.....	.....	1.10	.....
Rhode Island				
Newport & Providence Railway	.....	.....	1.00	.....
United Electric Railways	0.346	.....	2.494	.....
Vermont				
Springfield Railway	.....	.....	.063	.50
Total	11.386	13.777	66.874	18.827
District of Columbia				
Capital Traction Co.	.....	.....	0.521	.....
			1.50	
Washington Railway & Electric Co.	.....	.....	1.38	2.37
Maryland				
Potomac Edison Co.	.....	.....	0.13	.....
Potomac Public Service Co.	.....	.....	1.67	.....
United Railways & Electric Co.	0.86	.....	17.00	.....
New Jersey				
Coast Cities Ry.	.....	.....	1.00	.....
Five Mile Beach Electric Ry.	.....	.....	4.00	.....
Morris County Traction Co.	.....	.....	.....	0.79
Trenton & Mercer County Traction Corp.	0.55	.....	2.04	.....
New York				
Auburn & Syracuse Elec. R.R.	.....	.....	0.35	.....
Brooklyn City Railroad	.....	.....	6.65	.....
Brooklyn-Manhattan Transit Corp.	8.311	.....	6.479	.....
Empire State Railroad	.....	.....	.....	4.33
Fonda, Johnstown & Gloversville R.R.	.....	.....	0.78	.....
Hamburg Ry.	.....	.....	1.00	.....
Interborough Rapid Transit Co.	3.41	.....	.....	.....
International Railway	.....	.....	5.027	.....
Kingston Consolidated Railway	.....	.....	0.20	.....
Niagara Junction Ry.	0.142	.....	.....	.....
New York & Harlem Railroad	.....	.....	1.40	.....
NewYork & Long Island Traction Co.	.....	.....	0.54	.....
New York & Queens County Ry.	.....	.....	1.138	.....
New York State Rys.	0.48	.....	7.47	.....
New York, Westchester & Boston Ry.	0.044	.....	.....	.....
Poughkeepsie & Wappingers Falls Ry.	.....	.....	1.00	.....
Richmond Lt. & R.R.	0.05	.....	4.10	.....
Rochester, Lockport & Buffalo R.R.	.....	.....	.....	0.40
Rochester & Syracuse R.R.	.....	.....	.....	0.50
Schenectady Railway	.....	.....	2.10	.....
Third Avenue Ry. System	0.145	.....	13.486	.....
United Traction Co.	.....	.....	6.663	.....
Pennsylvania				
Alleghany Valley St. Ry.	.....	.....	0.60	.....
Altoona & Logan Valley Elec. Ry.	0.26	.....	2.09	.....
Bangor-Nazareth Transit Co.	.....	.....	1.00	.....
Chambersburg, Greencastle & Waynesboro St. Ry.	.....	.....	0.30	.....
Erie Railways	.....	.....	0.45	.....
Harrisburg Railways	0.52	.....	3.66	.....
Hershey Transit Co.	.....	.....	15.00	.....
Irwin-Herminie Traction Co.	.....	.....	0.50	.....
Lackawanna & WyomingValley R.R.	0.22	.....	.....	.....
Lehigh Traction Co.	.....	.....	0.75	.....
Philadelphia Rapid Transit Co.	11.412	.....	24.318	.....
Reading Transit & Light Co.	3.10	.....	3.80	1.20
Scranton Railway	.....	.....	2.16	1.10
Shamokin & Mt.Carmel Transit Co.	.....	.....	.....	5.00
Southern Cambria Railway	.....	.....	0.50	.....
Trenton, Bristol & Philadelphia St. Ry.	.....	.....	.....	0.50
West Penn. Rys.	.....	.....	3.01	.....
Wilkes-Barre & Hazleton Ry.	.....	.....	.....	0.18
York Railways	0.43	0.13	1.40	.....
Virginia				
Danville Traction & Pwr. Co.	.....	.....	0.47	.....
Newport News & Hampton Ry.	.....	.....	0.08	.....
Virginia Railway & Pwr. Co.	0.257	.....	2.31	.....
West Virginia				
Monongahela, West Penn. Public Service Co.	.....	0.19	0.56	.....
Princeton Power Co.	.....	.....	2.02	.....
Tygarts Valley Traction Co.	.....	.....	4.00	.....
Tyler Traction Co.	.....	11.42	.....	.....
Total	30.191	11.740	161.463	16.370
Illinois				
Aurora, Elgin & Fox River Elec. Co.	.....	.....	.....	4.17
Chicago & Joliet Electric Ry.	0.32	.....	0.25	2.01
Chicago North Shore & Milwaukee R.R.	.....	5.30	.....	10.00
Chicago Rapid Transit Co.	.....	.....	20.30	.....
Chicago Surface Lines	8.18	.....	11.02	.....
Chicago & West Towns Ry.	.....	.....	1.25	.....
East St. Louis & Suburban Ry.	.....	.....	5.35	.....
Evanston Railway	.....	.....	2.00	.....
Illinois Central Electric Ry.	.....	0.18	.....	0.80
Ill. Power & Light Corp.	.....	.....	0.70	.....
Pekin Municipal Ry.	.....	.....	2.00	.....
Rockford & Interurban Ry.	.....	.....	1.528	0.234
Sterling, Dixon & Eastern Elec. Ry.	.....	0.07	.....	.....
Indiana				
Chicago, South Bend & Northern Ind. Ry.	.....	.....	1.80	.....
Indiana Service Corp.	1.89	.....	6.85	.....
Interstate Public Service Co.	.....	.....	0.60	0.61
Northern Indiana Power Co.	.....	.....	0.80	.....
Southern Indiana Gas & Elec. Co.	0.753	0.07	0.561	.....
Union Trac. Co. of Ind.	.....	0.25	0.46	1.52
Iowa				
Clinton Street Ry.	.....	.....	0.54	.....
Des Moines City Ry.	4.20	.....	1.40	.....
Dubuque Electric Co.	.....	.....	1.00	.....
Keokuk Electric Co.	.....	.....	0.60	.....
Mississippi Valley Electric Co.	.....	.....	0.30	.....
Sioux City Service Co.	0.30	.....	1.00	.....
Tri-City Ry.	0.87	0.34	5.29	.....

Track Built and Rebuilt During 1924 (Concluded)

Name of Railway	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, City	Miles, Interurban
Kentucky				
Cincinnati, Newport & Covington Ry.	.....	.....	1.00	.....
Kentucky Traction & Terminal Co.	0.70	.....	.....	.....
Louisville Ry.	1.556	.....	4.526	0.45
Mayville Street Railroad	.....	.....	0.50	.....
Paducah Railway Co., Inc.	.....	.....	0.30	.....
Michigan				
City of Detroit—Dept. of Street Rys.	7.817	.....	3.066	.....
Detroit United Railway	4.90	6.13	1.82	.....
Grand Rapids Railway	0.815	.....	0.649	.....
Marquette City Railway	.....	.....	0.88	.....
Menominee & Marinette Lt. & Trac. Co.	.....	.....	0.459	.....
Muskegon Traction & Lighting Co.	0.289	.....	0.207	.....
Saginaw Transit Co.	.....	.....	3.70	.....
Minnesota				
Duluth Street Railway	2.03	.....	2.00	.....
Twin-City Rapid Transit Co.	3.60	.....	16.23	.....
Missouri				
Cape Girardeau-Jackson Interurban Ry.	.....	.....	0.50	....
Kansas City, Lawrence & Topeka Elec. R.R.	.....	.....	.....	0.11
Kansas City Railways	2.019	.....	7.197	....
Missouri & Kansas Ry.	.....	.....	1.00	....
Springfield Traction Co.	.....	.....	0.31	....
St. Joseph Ry., Lt., Ht. & Pwr. Co.	0.32	.....	1.23	....
United Railways Company of St. Louis	1.33	0.12	12.34	7.00
Ohio				
Cincinnati & Dayton Traction Co.	.....	.....	.....	6.00
City of Ashtabula	.....	.....	0.18	.....
Cincinnati Traction Co.	10.12	.....	4.00	.....
Cleveland Railway	1.23	.....	11.28	.....
Columbus, Delaware & Marion Elec. Co.	.....	0.32	.....	.....
Columbus, Newark & Zanesville Elec. Ry.	.....	.....	1.00	.....
Community Traction Co.	1.15	.....	1.27	.....
Dayton, Covington & Piqua Traction Co.	.....	.....	.....	1.00
Dayton, Springfield & Xenia Southern Ry.	.....	.....	.....	0.19
Lake Shore Elec. Ry.	.....	.....	.....	0.56
Lancaster Traction & Power Co.	.....	.....	2.27	.....
Lima City Street Railway	.....	.....	1.88	.....
Lima Toledo Railroad	0.34	.....	.....	.....
Northern Ohio Traction & Lt. Co.	.....	.....	4.00	4.00
Ohio Public Service Co.	.....	.....	0.17	50.08
Ohio River Electric Railway	.....	.....	5.00	.....
Pennsylvania-Ohio Electric Co.	0.677	.....	2.24	.....
People's Railway	0.061	.....	1.10	.....
Springfield Ry. Co.	.....	.....	0.449	.....
Springfield & Xenia Railway	.....	.....	.....	1.00
Stark Electric Railroad	.....	.....	0.75	.....
Wisconsin				
Lake Superior District Pwr. Co.	0.50	.....	.....	.....
Madison Railways	0.18	.....	0.38	.....
Milwaukee Elec. Ry. & Lt. Co.	2.679	.....	10.475	0.928
Wisconsin Power & Light Co.	.....	.....	2.46	.....
Wisconsin Public Service Corp.	.....	.....	0.50	.....
Wisconsin Ry., Lt. & Pwr. Co.	0.70	.....	0.78	.....
Wisconsin Valley Elec. Co.	.....	.....	0.51	.....
Totals	59.526	12.780	174.207	90.662
Alabama				
Alabama Power Co.	0.30	.....	0.90	.....
Birmingham Electric Co	1.661	.....	10.979	.....
Mobile Light & Railroad	.....	.....	1.192	.....
Arkansas				
Arkansas Central Power Co.	2.40	.....	1.19	.....
Hot Springs St. Railway	.....	.....	1.22	.....
Florida				
Jacksonville Traction Co.	.....	.....	0.38	.....
Pensacola Elec. Co.	.....	0.66	.....	.....
Georgia				
Georgia Railway & Pwr. Co.	2.583	0.187	6.818	.....
Macon Ry. & Light Co.	.....	.....	0.20	.....
Louisiana				
Baton Rouge Electric Co.	3.26	.....	3.02	.....
New Orleans Public Service, Inc.	2.20	.....	14.20	.....
Shreveport Railways	0.74	.....	0.83	.....
Mississippi				
Laurel Light & Railway Co.	.....	.....	1.00	.....
North Carolina				
Durham Public Service Co.	.....	.....	0.80	.....
Southern Public Utilities Co.	0.75	.....	.....	.....
Tennessee				
Knoxville Power & Light Co.	0.614	.....	1.002	.....
Union Traction Co.	.....	.....	.....	1.00
Totals	14.508	0.847	43.731	1.00

Name of Railway	Extensions, Miles City	Extensions, Miles Interurban	Rebuilt, City	Miles, Interurban
Arizona				
Tucson Rapid Transit Co.	.....	.....	0.51	.....
California				
Key System Transit Co.	1.65	0.66	8.00	.....
Los Angeles Railway	3.56	.....	20.13	.....
Market Street Railway	.....	.....	5.491	.....
Munic. Ry. of San Francisco	4.73	.....	.....	.....
Pacific Electric Ry.	2.15	8.29	3.51	11.85
Pacific Gas & Electric Co.	.....	.....	5.16	.....
Peninsular Ry.	.....	.....	0.61	1.06
Petaluma & Santa Rosa R.R.	.....	0.65	.....	.....
Sacramento & Northern Railroad	.....	0.42	.....	.....
San Diego & Arizona Ry.	.....	.....	.....	0.848
San Diego Electric Railway	3.248	18.891	5.468	2.673
San Francisco, Napa & Calestoga Ry.	.....	.....	0.34	12.00
Santa Barbara & Suburban Railway	.....	.....	0.28	.....
Colorado				
Denver & Intermountain R.R.	.....	2.217	4.047	.....
Denver Tramway	0.698	0.206	8.225	1.747
Grand River Valley Ry.	.....	5.50	.....	.....
Southern Colorado Power Co.	.....	.....	0.917	.....
			0.565	
Kansas				
Kansas Electric Power Co.	.....	.....	1.00	.....
Salina Street Ry.	.....	.....	2.00	.....
Hutchinson Interurban Ry.	.....	.....	1.00	.....
Montana				
Butte Electric Railway	0.06	.....	0.16	.....
Helena Light & Railway Co.	.....	0.42	0.50	0.15
Missoula Street Railway	.....	.....	0.34	.....
Montana Power Co.	1.32	.....	0.48	.....
Nebraska				
Omaha & Council Bluffs St. Ry.	.....	.....	10.00	.....
New Mexico				
City Electric Co.	.....	.....	3.00	.....
North Dakota				
Northern States Power Co.	.....	.....	0.34	.....
Texas				
Abilene Traction Co.	.....	.....	0.50	.....
Bryan-College Traction Co.	.....	0.25	.....	4.00
Dallas Railway	4.65	.....	1.53	.....
El Paso Electric Railway	0.64	.....	0.61	.....
Galveston Electric Co.	.....	.....	1.00	.....
Houston Electric Co.	1.88	.....	5.73	.....
Northern Texas Traction Co.	4.647	.....	4.87	.....
San Antonio Public Service Co.	3.605	.....	0.189	.....
Texas Electric Railway	0.71	.....	2.46	.....
Texas Interurban Railway	.....	4.11	.....	.....
Utah				
Utah Light & Traction Co.	.....	.....	1.13	.....
Washington				
Grays Harbor Ry. & Lt. Co.	0.25	.....	0.50	.....
Pacific Northwest Trac. Co.	4.94	.....	.....	.....
Puget Sound International Ry. & Power Co.	.....	.....	1.619	3.00
Puget Sound Elec. Ry.	.....	.....	0.44	.....
Seattle Munic. St. Ry.	0.34	.....	13.007	.....
Walla Walla Valley Ry.	.....	7.05	.....	.....
Willapas Electric Co.	0.02	.....	0.19	.....
Yakima Valley Transportation Co.	.....	0.15	.....	.....
Totals	39.098	48.814	115.847	37.348
Manitoba				
Winnipeg Elec. Ry.	2.21	1.32	1.12	1.08
New Brunswick				
New Brunswick Power Co.	0.34	.....	1.09	.....
Nova Scotia				
Cape Breton Electric Co.	.....	.....	0.25	.....
Ontario				
Brantford Munic. Railway	35.00	.....	.....	.....
Dominion Power & Transmission Co.	.....	.....	0.30	0.07
Ft. William Electric Ry.	0.50	.....	.....	2.30
Hydro Electric Railways	0.52	0.55	0.25	1.50
International Transit Co.	3.39	.....	.....	.....
Kitchener & Waterloo St. Ry.	0.30	.....	.....	2.25
Ottawa Electric Ry.	1.50	.....	.....	.....
Peterboro Radial Ry.	.....	.....	0.44	.....
Toronto Transportation Commission	10.006	.....	1.994	.....
Windsor, Essex & Lake Shora Rapid Ry.	.....	0.75	.....	1.50
Quebec				
Hull Electric Co.	.....	.....	0.25	2.80
Levis County Railway	.....	.....	0.15	.....
Montreal & Southern Counties Ry.	0.13	1.64	0.26	.....
Montreal Tramways	6.34	1.77	15.11	2.91
Quebec Railway, Light & Power Co.	2.93	.....	0.94	.....
Saskatchewan				
Regina Munic. Railway	.....	.....	0.20	.....
Sherbrooke Ry. & Power Co.	0.21	.....	0.24	.....
Alberta				
Lethbridge Munic. St. Ry.	.....	.....	0.79	.....
Totals	63.376	6.030	23.384	14.610

the Cincinnati Traction Company and the Toronto Transportation Commission. Each of these was approximately 10 miles in extent.

Among the railways which have done extensive reconstruction of city track during the past year are the Twin City Rapid Transit Company, Minneapolis; United Railways, St. Louis; Birmingham Electric Company, New Orleans Public Service, Inc., Seattle Municipal Railway and the Montreal Tramways. Each of these companies rebuilt more than 10 miles of track during the year. Many other railways did smaller amounts of city track reconstruction. Of the total of 764 miles of track rebuilt in 1924, 585 miles, or more than 75 per cent, was on city lines.

Extensive reconstruction of interurban track was done by the Pacific Electric Railway and the San Francisco, Napa & Calistoga Railway. Other companies also did considerable amounts of this work during the year. The total trackage involved, however, amounted to only about 178 miles.

Electric railway trackage partially abandoned in 1924 was slightly larger than in 1923, the total last year being 258 miles as compared with 240 the preceding year. City abandonments increased somewhat, while the mileage of interurban abandonments decreased.

Only one abandonment was of sufficient extent to be of general interest—that of the Middlesex & Boston Street Railway. This company suspended railway service on 27 miles of track and inaugurated bus service to care for the transportation needs of several suburban towns, as told in the ELECTRIC RAILWAY JOURNAL in the issue of Dec. 6.

Abandonments—Partial—1924

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

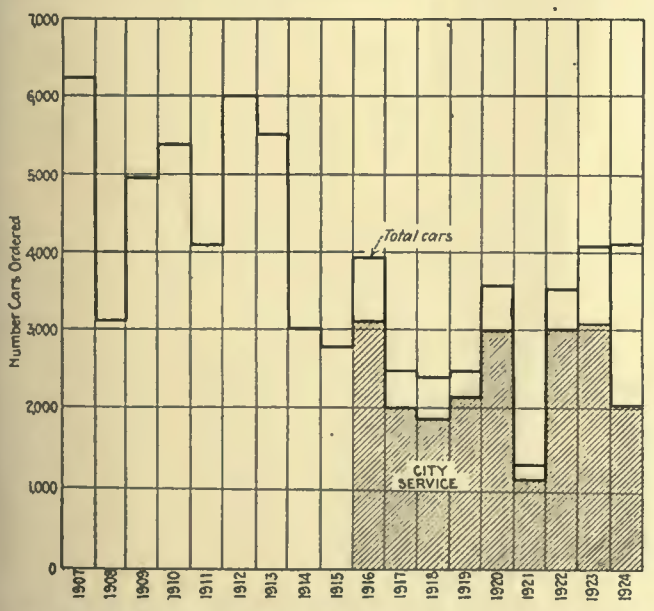
	City	Interurban
Connecticut		
Connecticut Company	3.651	0.384
Hartford & Springfield St. Ry	.....	2.30
Maine		
York Utilities Co	.....	16.02
Massachusetts		
Berkshire St. Railway	.....	9.201
Boston Elevated Railway	8.01	.....
Eastern Mass. St. Ry	4.06	3.63
Massachusetts Northeastern St. Ry	.....	6.22
Middlesex & Boston St. Ry	27.46	.....
New Hampshire		
Portsmouth Electric Railway	1.31	.....
Rhode Island		
United Electric Railways	2.00	.....
Maryland		
United Railways and Electric Co	0.50	.....
New Jersey		
Five Mile Beach Electric Railway	0.09	.....
New York		
Geneva, Seneca Falls & Auburn R.R	0.20	.....
Interborough Rapid Transit Co	1.63	.....
New York & Harlem Railroad	0.04	.....
New York & Long Island Traction Co	2.097	.....
Rochester, Lockport & Buffalo R.R	.....	0.93
Third Ave. Ry. System	7.299	.....
United Traction Co	.....	0.03
New York, New Haven & Hartford R.R	0.015	.....
New York State Railways	0.74	.....
Niagara Junction Ry	0.015	.....
Peekskill Lighting and Railroad Co	3.38	.....
Pennsylvania		
Altoona & Logan Valley Electric Ry	.....	0.24
Jefferson Traction Co	.....	6.00
Northumberland County Ry	2.00	.....
Pennsylvania & Maryland St. Ry	.....	4.00
Philadelphia Rapid Transit Co	1.735	.....
Pittsburg County Ry	0.45	.....
Scranton Railway	3.00	8.20
United Traction St. Railway	.....	0.50
Valley Railways	3.00	.....
West Penn. Railways	0.50	.....
York Railways	0.40	.....
Virginia		
Newport News & Hampton Ry. Gas & Elec. Co	.....	1.90
Virginia Ry. & Power Co	0.88	.....
West Virginia		
Monongahela West Penn. Public Service Co	.....	0.03
Princeton Power Co	0.22	.....
Illinois		
Chicago Surface Lines	0.27	.....
Chicago & Joliet Electric Ry	.....	1.89
East St. Louis & Suburban Ry	3.00	0.02
Ill. Power & Light Corp	1.06	.....
Sterling Dixon & Eastern Elec. Ry	.....	0.02
Indiana		
Indiana, Columbus & Eastern Trac. Co	.....	6.42
Iowa		
Keokuk Electric Co	0.90	.....
Tri-City Railway Company	5.23	.....
Waterloo, Cedar Falls & Nor. Ry	0.20	.....
Michigan		
City of Detroit—Department St. Rys	9.0048	.....
Grand Rapids Railway	0.637	.....
Menominee & Marinette Lt. & Traction Co	0.214	.....
Muskegon Traction & Lighting Company	0.453	.....
Saginaw Transit Co	0.77	5.40
Missouri		
United Railways Co. of St. Louis	0.01	.....
Ohio		
Cincinnati Traction Co	1.45	.....
Cleveland Railway	0.584	.....
Community Traction Co	5.62	.....
Lima City Street Railway	0.30	.....
Pennsylvania-Ohio Electric Co	1.58	.....
Wisconsin		
Milwaukee Elec. Ry. & Lt. Co	0.839	.....
Wisconsin Power & Light Co	.....	8.25
Wisconsin Ry., Lt. & Power Co	0.67	.....
Kentucky		
Louisville Ry	1.959	.....
Alabama		
Alabama Power Company	0.52	.....
Birmingham Elec. Co	7.706	.....
Mobile Light & Railroad	3.69	.....
Arkansas		
Arkansas Central Power Co	0.19	.....
Florida		
Pensacola Electric Co	.....	0.60
Georgia		
Georgia Railway & Power Co	1.718	.....
Louisiana		
New Orleans Public Service, Inc	4.11	.....
Tennessee		
Knoxville Power & Light Co	0.276	.....
California		
Key System Traction Co	1.60	.....
Market Street Railway	0.010	.....
Pacific Electric Railway	3.43	1.20
San Diego Electric Railway	4.736	2.437
San Francisco-Sacramento Railroad	.....	10.50
Colorado		
Denver Tramway	1.592	.001
Southern Colorado Power Co	0.955	.....
Idaho		
Boise Valley Traction Co	2.26	.....
Kansas		
Hutchinson Interurban Ry	.50	.....
Montana		
Helena Light & Railway	0.12	1.21
Texas		
Dallas Ry	0.932	.....
El Paso Electric Railway	0.24	.....
Northern Texas Trac. Co	0.348	.....
San Antonio Public Service Co	4.387	.....
Washington		
Pacific Traction Co	2.57	.....
Puget Sound International Ry. & Power Co	0.327	.....
Seattle Munic. Ry	0.94	.....
Tacoma Ry. & Power Co	1.29	.....
Canada		
Fort William Electric Ry	0.50	.....
Hydro Electric Power Commission	0.16	.....
Lethbridge Munic. St. Railway	0.71	.....
Montreal Tramways	1.06	.....
St. Johns Electric Company	2.1	.....
Toronto Transportation Commission	2.490	.....
Winnipeg Electric Co	.....	0.416
Totals	160.919	97.949

Car Orders Exceed High Level of 1923

Number of Passenger Cars Ordered for Interurban Service Highest Since 1913 — Fewer Passenger Cars Ordered for City Service—One-Man, Two-Man Cars Constitute More than 60 per Cent of Total Cars Ordered for City Service

THE high level of purchases of electric railway rolling stock which began in 1920 was again exceeded during last year. This is shown by the statistics for new cars ordered during 1924 as given in the accompanying tables. While there was a marked recession in orders during 1921, which marked the low level, a large increase in buying began in 1922, and this was exceeded during 1923 and 1924. The total of 4,092 cars and locomotives ordered during 1924 is not only slightly greater than last year but it exceeds any previous year since 1913. The maintaining of this high level shows that stability has again been established in the industry and that confidence has been restored. This augurs well for the future.

The analysis in Table V of various types of cars ordered shows in a very striking manner that the one-man, two-man cars are most popular. A total of 1,262 cars of the one-man, two-man type were purchased during the past year. Of these, 1,224 were for city service and 38 for interurban service. The orders for this type of car for city service are thus seen to constitute more than 60 per cent of the total for this class of service. Purchases of one-man single-truck cars with 28-ft. body were but 103—the lowest since this type of car came into popularity in 1916. The number of one-man cars purchased with bodies larger than 28 ft. included 28 single-truck cars and 68 double-truck cars for city service and 9 single-truck and 52 double-truck for interurban service. The number of cars ordered for straight two-man operation shows a decided decrease, there being but 279 of these for city service and 100 for interurban service. It is evident that development of the one-man, two-man type of car is rapidly causing it to replace the straight two-man car.



New Cars and Locomotives Ordered by Years. The Division Into City and Interurban Cars Is Not Made Prior to 1916

A comparison of the various figures for passenger cars ordered during 1924 with similar ones for 1923 further demonstrates the swing toward cars for one-man, two-man operation. The totals for all other types of cars purchased show a decrease, while the one-man, two-man type has increased from 1,114 to 1,262. The total of all types of one-man cars for 1924 is 260, as compared with 551 for 1923. The number ordered during the past year is thus seen to be less than half of that of the previous year.

A comparison of figures for the length, seating capacity and weight of cars ordered during 1924 shows that they have remained about the same as for 1923. The preponderance of orders is for light-weight, double-

TABLE I—NEW ROLLING STOCK ORDERED SINCE 1907

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

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

TABLE II—SPECIAL COMPARISON OF NEW ROLLING STOCK ORDERS BY YEARS

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

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

truck cars. Nearly all of the cars with double trucks are equipped with four motors. This is in line with the practice established in recent years of using quadruple motor equipments with small diameter wheels.

There were 16 electric railways that ordered 50 or more cars during 1924, the same number as for 1923. Of these, the Brooklyn City Railroad ordered 335 one-man, two-man cars, the Pittsburgh Railways 125 one-man, two-man and 100 two-man cars, the Illinois Central Railroad ordered 130 motor cars and 85 trailers for train operation, the Interborough Rapid Transit Company 150 motor cars for train operation and the Los Angeles Railway 121 one-man, two-man cars. Orders for 100 cars each were placed by the Philadelphia Rapid Transit Company and the Chicago Surface Lines for one-man, two-man types. The Chicago Rapid Transit Company also ordered 100 cars for train operation. In addition to these railways, the Baltimore & Ohio Railroad ordered 80 passenger cars for train operation on the Staten Island Rapid Transit lines,

Table III—Details of Rolling Stock Ordered During 1924

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
New England States											
Connecticut											
New York, New Haven & Hartford R.R.	3	Passenger	Interurban	Motor	Double	Two	71—11	106	87.75	4	.....
	10	Passenger	Interurban	Motor	Double	Two	72— 7½	80	60.00	2	.....
Maine											
Fairfield & Shawmat Ry.	2	Passenger	Interurban	Motor	Single	Two	.....	60	.....	2	.....
Somerset Traction Co.	1	Passenger	Interurban	Motor	Single	One	30—0	32	.....	2	.....
Massachusetts											
Boston Elevated Ry.	56	Passenger	City	Motor	Double	Both	45— 0	44	15.70	4	.....
	8	Passenger	City	Motor	Double	Train	47— 3	48	22.00	4	.....
Eastern Massachusetts St. Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	84 CM
East Taunton St. Ry.	4	Passenger	Interurban	Motor	Double	One	40— 0	36	23.00	4	.....
Massachusetts Northeastern St. Ry.	5	Passenger	City	Motor	Double	Both	41— 4½	44	17.12	4	.....
Worcester Consolidated Street Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
New Hampshire											
Chester & Derry R.R.	1	Sweeper	Interurban	Motor	.....	.....	.....	.....	.....	.....	.....
Nashua St. Ry.	2	Passenger	City	Motor	Single	One	28— 0	33	8.00	2	.....
Rhode Island											
United Electric Railways	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	235 STM
Vermont											
Springfield Terminal Ry. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
Total cars New England States	92										
Eastern States											
District of Columbia											
Washington Railway & Electric Co.	6	Passenger	City	Motor	Double	Two	42— 3	44	20.90	4	.....
	4	Passenger	City	Motor	Double	Two	42— 3	44	19 27	2	.....
Maryland											
Baltimore & Ohio R.R.	80	Passenger	Interurban	Motor	Double	Train	67— 0	71	47.50	2	.....
New Jersey											
Coast Cities Ry. Co.	7	Passenger	City	Motor	Double	Both	40— 0	40	16.00	4	.....
	6	Passenger	City	Motor	Single	One	28— 0½	32	8.20	2	.....
Five Mile Beach Electric Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
Morris County Traction Co.	10	Passenger	Interurban	Motor	Double	One	41—10	48	16.00	4	.....
Trenton & Mercer County Traction Co.	20	Passenger	City	Motor	Double	Both	45— 0	48	17.24	4	.....
New York											
Brooklyn-Manhattan Transit Corp.	4*	Passenger	City	Both	Four	Two	137— 0	160	.....	4	302 CM 3 CT
Buffalo & Erie Railway	14	Passenger	Interurban	Motor	Double	One	44— 2	41	18.50	4	.....
	4	Passenger	City	Motor	Single	One	26— 2	31	8.50	2	.....
Fonda, Johnstown & Gloversville R.R.	1	Passenger	Interurban	Motor	Double	Two	52— 9	57	.....	4	5 CM
Interborough Rapid Transit Co.	125	Passenger	City	Motor	Double	Train	51— 0½	46	39.50	2	7 CM
	25	Passenger	City	Motor	Double	Train	51— 0½	46	37.80	2	3 CT
Long Island R.R.	40	Passenger	Interurban	Motor	Double	Train	63— 4½	78	57.50	2	.....
New York & Queens County Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5 CM
New York State Rys., Rochester	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
	1	Dump	City	Trailer	Double	.....	40— 6	.....	16.00	.....	.....
New York, Westchester & Boston Ry.	10	Passenger	Interurban	Motor	Double	Two	72— 0	80	60.00	2	.....
Olean, Bradford & Salamanca Ry. Co.	4	Passenger	City	Motor	Single	One	29— 1	28	9.76	2	1 IM
Poughkeepsie & Wappingers Falls Ry.	2	Passenger	City	Motor	Single	Both	41—10	44	16.50	4	5 CM
Richmond Light & R.R. Co.	25	Passenger	City	Motor	Double	Both	44— 0	44	16.90	4	.....
	2	Sweeper	City	Motor	Double	.....	39— 0	.....	27.35	.....	.....
Schenectady Railway	10	Passenger	City	Motor	Double	One	41— 4½	48	16.00	4	.....
The Brooklyn City R.R.	335	Passenger	City	Motor	Double	Both	44— 2	50	20.75	4	25 CM Service 69 CM 25 CMS
Third Avenue Railway	49	Passenger	City	Motor	Single	Both	30— 5	36	8.55	2	88 CM
	1	Passenger	City	Motor	Single	Both	35— 3	44	8.55	2	.....
Pennsylvania											
Bangor & Portland Transit Co.	1	Passenger	Interurban	Motor	Single	One	28— 0½	32	8.60	2	.....
East Penn. Electric Co.	8	Passenger	Interurban	Motor	Double	Both	43—10	48	17.78	4	.....
	8	Passenger	Interurban	Motor	Double	Both	38—11	40	17.11	4	.....
Hershey Transit Co.	1	Express	Interurban	Motor	Double	Two	40— 6	.....	30.00	4	.....
Johnstown Traction Co.	3	Passenger	City	Motor	Double	Both	47— 0	50	19.54	4	.....
Lackawanna & Wyoming Valley R.R. Co.	4	Passenger	Interurban	Motor	Double	Two	60— 6	72	41.25	2	.....
Philadelphia & West Chester Traction Co.	10	Passenger	Interurban	Motor	Double	Two	47—10	64	29.54	4	.....
Philadelphia & Western Railway Co.	1	Passenger	Interurban	Motor	Double	Two	50— 6	55	30.24	4	.....
Philadelphia Rapid Transit Co.	100	Passenger	City	Motor	Double	Both	45— 6	53	17.91	2	17 CM 23 CW
Pittsburgh Railways	225	Passenger	City	Motor	Double	Both	45— 0	54	19.00	4	203 CM 7 CM
Reading Transit & Light Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2 SM
Shamokin & Mt. Carmel Transit Co.	4	Passenger	Interurban	Motor	Double	Both	45— 0	48	18.00	4	8 IM
	1	Passenger	City	Motor	Single	One	28— 0½	33	8.10	2	.....
Westchester Street Railway	1	Passenger	City	Motor	Single	One	28— 0½	33	8.33	2	.....
	6	Passenger	Interurban	Motor	Double	Two	57— 0	70	25.00	4	.....
West Penn. Rys.	6	Freight	Interurban	Motor	Double	.....	46— 7	.....	22.00	4	.....
	1	Sweeper	Interurban	Motor	Single	.....	35— 0	.....	.....	2	.....
York Railways	2	Passenger	City	Motor	Double	Both	42— 0	44	16.50	4	.....
	3	Passenger	Interurban	Motor	Double	Both	47— 6	52	19.70	4	.....

*Three-section units.

Table III—Details of Rolling Stock Ordered During 1924—(Continued)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
West Virginia											
Monongahela & West Penn Public Service Co.	3	Passenger	City	Motor	Single	One	28— 0½	28	9.00	2	.....
Princeton Power Co.	4	Passenger	City	Motor	Double	Two	37— 2	40	14	4	.....
	2	Passenger	Interurban	Motor	Double	Two	37— 2	40	14	4	.....
Fairmont & New Martinsville Traction Co.	3	Passenger	Interurban	Motor	Double	Both	42— 9	46	15.34	4	.....
Tygarta Valley Traction Co.	2	Passenger	City	Motor	Single	One	28— 0½	33	8.00	2	2 CT
Wheeling Traction Co.	21	Passenger	City	Motor	Double	One	42— 6	44	10.50	4	8 CM
Total cars Eastern States	1206										
Central States											
Illinois											
Chicago North Shore & Milwaukee R.R.	1	Freight	Interurban	Trailer	Double	.....	40— 6	.....	21.50	.....	2 CM
Chicago Rapid Transit Co.	100	Passenger	City	Motor	Double	Train	48— 0	52	37.50	2	7 CM
Chicago Surface Lines	100	Passenger	City	Motor	Double	Both	48—11	51	20.50	2	.....
East St. Louis & Suburban Ry.	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
Illinois Central R.R.	85	Passenger	Interurban	Trailer	Double	Train	72— 7½	84	42.00	.....	.....
	130	Passenger	Interurban	Motor	Double	Train	72— 7½	84	62.50	4	.....
Illinois Pwr. & Lt. Corp.	5	Passenger	City	Motor	Single	One	28— 0½	32	8.00	2	.....
Kankakee & Urbana Traction Co.	1	Passenger	Interurban	Motor	Double	One	42— 0	52	18.00	4	.....
Indiana											
Gary & Valparaiso Ry.	2	Passenger	Interurban	Motor	Double	Two	44— 8½	44	21.29	4	.....
Indiana Service Corp.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7 CM
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 IM
	1	Passenger	Interurban	Trailer	Double	.....	52— 0	50	27.00	.....	.....
	2	Parl. Dnr.	Interurban	Motor	Double	Both	62— 0	26	45.50	2	.....
	3	Sleeping	Interurban	Trailer	Double	.....	62— 0	20	39.40	.....	.....
Interstate Public Service Co.	2	Express	Interurban	Motor	Double	.....	60— 0	.....	44.35	4	.....
	3	Express	Interurban	Trailer	Double	.....	52— 0	.....	27.25	.....	.....
	10	Freight	Interurban	Trailer	Double	.....	42— 0	.....	26.50	.....	.....
	10	Stock	Interurban	Trailer	Double	.....	39— 7	.....	26.50	.....	.....
	2	Misc.	Interurban	Trailer	Double	.....	40— 0	.....	28.50	.....	.....
Terre Haute, Indianapolis & Eastern Tr. Co.	6	Freight	Interurban	Trailer	Double	.....	38— 3	.....	15.50	.....	.....
	15	Passenger	Interurban	Motor	Double	Two	61— 0	66	45.00	4	.....
	6	Passenger	City	Motor	Single	One	28— 0	34	9.00	2	.....
Union Traction Co. of Ind.	5	Express	Interurban	Motor	Double	.....	53— 0	.....	36.00	4	.....
	15	Freight	Interurban	Trailer	Double	.....	43— 0	.....	18.50	.....	.....
	5	Stock	Interurban	Trailer	Double	.....	38— 0	.....	16.00	.....	.....
Winona Service Co.	3	Passenger	Interurban	Motor	Double	Two	49— 9	42	25.00	4	.....
	4	Passenger	City	Motor	Single	One	27—10	32	8.75	2	.....
Iowa											
Tri-City Railways	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
Waterloo, Cedar Falls & Northern Ry.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	37 IM
Kentucky											
Kentucky Traction & Terminal Co.	2	Passenger	City	Motor	Single	One	26— 4	24	6.50	2	17 CM
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4 IM
Michigan											
	75	Passenger	City	Motor	Double	Two	48— 5	52	18.50	4	173 CM
City of Detroit—Dept. of St. Rys.	1*	Passenger	City	Motor	Four	Two	122— 8	140	37.50	6	.....
	2	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
	4	Dump	City	Trailer	Double	.....	40— 6	.....	16.00	.....	.....
	30	Passenger	City	Motor	Double	Both	41—11	52	14.25	4	133 CM
	20	Passenger	City	Motor	Double	Both	42— 6	51	14.25	4	.....
Detroit United Rys.	10	Passenger	Interurban	Motor	Double	Both	43— 2	46	18.75	4	.....
	10	Passenger	Interurban	Motor	Double	Two	56— 6	54	33.15	4	.....
	50	Freight	Interurban	Trailer	Double	.....	.....	.....	20.75	.....	.....
Grand Rapids Railway	3	Passenger	City	Motor	Double	Both	37— 6	44	12.00	4	.....
Menominee & Marinette Lt. & Tr. Co.	6	Passenger	City	Motor	Single	One	28— 0½	30	8.25	2	4 CM
Michigan Electric Ry.	15	Freight	Interurban	Trailer	Double	.....	50— 0	.....	19.62	.....	.....
	2	Freight	Interurban	Motor	Double	.....	50— 0	.....	29.50	4	.....
Saginaw Transit Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 CM
Minnesota											
Duluth St. Railway	5	Passenger	City	Motor	Double	One	36— 0	43	11.00	4	.....
Missouri											
United Railways of St. Louis	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	26 CM
	1	Dump	City	Trailer	Double	.....	40— 6	.....	16.50	.....	.....
Ohio											
Cincinnati, Georgetown & Portsmouth R.R.	2	Passenger	Interurban	Motor	Double	One	40— 0	47	13.00	4	.....
City of Ashtabula, Div. of Street Rys.	1	Sweeper	City	Motor	Single	.....	30— 0	.....	.....	.....	.....
	25	Passenger	City	Motor	Double	Two	52— 5½	56	22.10	4	73 CM
	4	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
Cleveland Railways	2	Dump	City	Trailer	Double	.....	40— 6	.....	16.00	.....	.....
	4	Crane	City	Motor	Double	.....	46— 0	.....	.....	.....	.....
	2	Rail	City	Trailer	Double	.....	60—0	.....	.....	.....	.....
Columbus, Newark & Zanesville Elec. Ry. Co.	20	Passenger	City	Motor	Single	One	29— 8	28	9.30	2	8 CM
Ohio Public Service Co.	1	Passenger	Interurban	Motor	Double	One	39— 4½	44	15.00	4	.....
Portsmouth Public Service Co.	3	Passenger	City	Motor	Double	Both	42—11	50	13.00	4	.....
Stark Electric R.R.	1	Dump	Interurban	Trailer	.....	.....	.....	.....	.....	.....	.....
The Cincinnati & Dayton Traction Co.	6	Passenger	City	Motor	Single	One	28— 0½	32	8.50	2	.....
The Cincinnati Traction Co.	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
The Ohio River Elec. Ity. & Pwr. Co.	7	Passenger	Interurban	Motor	Single	One	29— 0	24	8.50	2	5 IM
The Pennsylvania-Ohio Electric Co.	4	Passenger	Interurban	Motor	Double	One	43—10½	48	18.50	4	.....
The Toledo & Indiana R.R.	7	Passenger	Interurban	Motor	Double	One	43— 2	50	15.75	4	.....
Wisconsin											
The Milwaukee Electric Ry. & Lt. Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1 CM
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27 work
Wisconsin Valley Electric Co.	4	Passenger	City	Motor	Double	One	43— 6	52	17.50	4	.....
Total cars Central States	849										
Southern States											
Alabama											
Birmingham Ity. Lt. & Pwr. Co.	20	Passenger	City	Motor	Double	Two	49— 5	62	17.50	4	.....
	1	Dump	City	Motor	Double	.....	40— 6	.....	22.50	4	.....
	2	Dump	City	Trailer	Double	.....	40— 6	.....	16.00	.....	.....
Arkansas											
Arkansas Central Pwr. Co.	8	Passenger	City	Motor	Double	Both	42— 5½	44	17.50	4	.....

*Three-section units

Table III—Details of Rolling Stock Ordered During 1924—(Concluded)

Name of Company	No.	Class	City or Interurban	Motor or Trailer	Single or Double Truck	One or Two Man	Length Over All Ft. In.	Seating Capacity	Total Wt. Light Tons	No. Motors	No. Cars Junked During Year
Florida											
Coral Gables Construction Company	5	Passenger	City	Motor	Single	One	28— 0½	33	8.14	2	
Miami Beach Electric Co.	6	Passenger	City	Motor	Single	One	28— 0½	33	8.16	2	
Munic. Ry. of St. Petersburg	7	Passenger	City	Motor	Double	One	40— 1	48	14.70	4	1 CM
	8	Passenger	City	Motor	Single	One	28— 0½	32	8.20	2	
Tampa Electric Co.	7	Passenger	City	Motor	Double	One	45— 7	52	16.00		
Georgia											
Columbus Transportation Co.											6 CM
Louisiana											
Baton Rouge Electric Co.	5	Passenger	City	Motor	Single	One	28— 0	32	7.00	2	
New Orleans Public Service, Inc.	55	Passenger	City	Motor	Double	Both	47— 8	52	20.75	2	
	2	Dump	City	Motor	Double		40— 6		22.50	4	
	2	Dump	City	Trailer	Double		40— 6		16.00		
Shreveport Railways	3	Passenger	City	Motor	Double	Both	40— 9	53	15.00	4	
North Carolina											
Asheville Power & Light Co.	6	Passenger	City	Motor	Single	One	28— 0½	33	8.17	2	
Durham Public Service Co.	4	Passenger	City	Motor	Double	One	39— 1½	48	14.00	4	4 CM
South Carolina											
North Anderson St. Ry.	1	Passenger	City	Motor	Single	One	28— 0½	33	8.10	2	
Tennessee											
Knoxville Power & Light Co.	7	Passenger	City	Motor	Double	One		51	13.80	4	10 CM
	7	Passenger	City	Motor	Single	One		29	8.50	2	
Memphis St. Railway	1	Dump	City	Motor	Double		40— 6		22.50	4	
	1	Dump	City	Trailer	Double		40— 6		16.00		
Total cars Southern States	158										
Western States											
California											
Fresno Traction Co.	12	Passenger	City	Motor	Double	Both	42— 5	44	15.50		
Key System Transit Co.	12	Passenger	Interurban	Motor	Double	Two	57— 7	68	30.00	2	
	4	Dump	Interurban	Motor	Double		40— 0		22.50	4	
	2	Dump	Interurban	Trailer	Double		40— 0		16.00		
Los Angeles Ry.	121	Passenger	City	Motor	Double	Both	48— 3	52	21.50	4	
Market Street Ry.	20	Passenger	City	Motor	Double	Two	47— 0	50	18.80	4	9 CM
	2	Dump	City	Motor	Double		40— 6		22.50	4	
Pacific Electric Ry.	50	Passenger	City	Motor	Double	Two	52— 2	65	28.90	4	3 CM
	600	Freight	Interurban	Trailer	Double		40— 8½		21.40		8 CS
	600	Freight	Interurban	Trailer	Double		43— 0½		23.85		36 IF
	150	Freight	Interurban	Trailer	Double		40—10		16.70		
Pacific Gas & Electric Co.	5	Passenger	City	Motor	Double	Both	40— 0	42	14.50	2	
Colorado											
Southern Colorado Power Co.	1	Passenger	City	Motor	Single	One	28— 0½	32	8.60	2	
Kansas											
Union Traction Co.	6	Passenger	Interurban	Motor	Double	Two	45— 0	45		4	
Montana											
Helena Light & Railroad Co.	3	Passenger	Interurban	Motor	Double	One	38— 9	48	16.00	4	
Nebraska											
Omaha & Council Bluffs Street Ry.	1	Dump	City	Motor	Double		40— 6		22.50	4	
North Dakota											
Northern States Power Co.											4 CM
Oklahoma											
Muskogee Electric Tr. Co.	6	Passenger	City	Motor	Single	One	28— 0½	34	8.00	2	
Texas											
Eastern Texas Electric Co.	8	Passenger	City	Motor	Double	Two	40— 1	4		4	
El Paso Electric Ry Co.											5 CM
Galveston Electric Co.	10	Passenger	City	Motor	Single	One	28— 0½	32	7.50	2	
Houston Electric Co.	15	Passenger	City	Motor	Double	Two	40— 1	44		4	
San Antonio Public Service Co.											15 CT 17 CM
Texas Interurban Ry.	6	Passenger	Interurban	Motor	Double	One	48— 5	56	17.00	4	
	1	Express	Interurban	Motor	Double		45— 8		17.00		
The Abelene Traction Co.	1	Passenger	City	Motor	Single	One	32— 0	32	6.00	2	
Washington											
Grays Harbor Ry. & Lt. Co.	2	Passenger	City	Motor	Double	One	43— 3	52	16.00	4	
Total cars Western States	1638										
Philippine Islands											
Manila Electric Co.	20	Passenger	City	Motor	Double	Two	41— 5	60	14	2	
Total cars Philippine Islands	20										
Dominion of Canada											
Nova Scotia											
Cape Breton Electric Co.											2 CM
Ontario											
Ft. William Electric Railway	1	Passenger	City	Motor	Double	One	48— 0	60		4	
Hydro Electric Power Commission	4	Passenger	City	Motor	Double	Both	45— 3	44	20.75	4	
	2	Passenger	Interurban	Motor	Double	Two	50— 0	60	24.90	4	
Ottawa Electric Railway	30	Passenger	City	Motor	Double	Both	45— 3	54	19.25	4	
Toronto Suburban Ry.	1	Passenger	Interurban	Motor	Double	Two	61— 9	66	39.90	4	1 IM
	1	Line	Interurban	Motor	Double						
Toronto Transportation Commission	3	Sweepers	City	Motor	Single						7 M
Quebec											
Montreal Tramways	25	Passenger	City	Motor	Double	Two	45— 3	42	22.00	4	64 CM
	25	Passenger	City	Trailer	Double		44— 3	45	19.00		
	2	Obs'rv't'n	City	Mntor	Double	Two	47— 7	50	22.32	4	
	1	Crane	City	Motor	Double		42— 0		38.80	4	
Sherbrooke Ry. & Pwr. Co.	3	Passenger	City	Mntor	Single	One	32— 0	32	8.00	2	
Total cars Canada	98										

the Department of Street Railways for the city of Detroit 75 two-man cars, one articulated unit and six dump cars, the Detroit United Railway 20 cars for interurban service, 50 one-man, two-man cars for city service and 50 freight interurban trail cars, the Boston Elevated Railway ordered 56 one-man, two-man cars and eight additional cars for train operation, New Orleans Public Service, Inc., 55 one-man, two-man cars and 4 dump cars, the Montreal Tramways 25 two-man cars, 25 trailers, two observation cars and one crane car, the Third Avenue Railway, New York, 50 one-man, two-man cars, and the Pacific Electric Railway 50 two-man cars and 1,350 freight cars. Of the above orders, those placed by the Boston Elevated Railway, the Baltimore & Ohio Railroad, the Interborough Rapid Transit Company, the Chicago Rapid Transit Company and the Illinois Central Railroad were for cars for train operation. Adding the cars ordered by the Long Island Railroad, the New York, New Haven & Hartford Railroad, and the Brooklyn-Manhattan Transit Corporation gives a total of 610 cars for train operation.

The numbers of cars junked during 1924, which was 1,853, exceeds that for any other year of which this paper has a record. It compares with 1,689 junked during 1923. It is thus evident that much obsolete rolling stock is being retired to give space for more modern equipment.

According to the replies received the number of companies ordering new rolling stock during 1924 was 119, as compared with 167 for 1923, 145 for 1922 and 94 for 1921. There were thus fewer companies ordering cars, but the average ordered by each company was greater.

In order to show at a glance the relative amount of rolling stock purchased by the various railways year by year, Table I has been prepared. This gives the total number of cars ordered each year since 1907. This divides the cars into four classes: Passenger cars, both city or interurban; freight, express and miscellaneous cars, and electric locomotives. The miscellaneous cars include service cars, snowplows, sweepers, work cars, etc. The chart shows graphically the number of cars ordered each year since 1916. In this chart the cars purchased are divided into two groups, interurban and city service. This division, which has been made in annual surveys of this paper since 1916, was made for passenger cars only prior to that year. It is evident that the number of cars purchased for interurban service this year is the greatest of any recorded, while the number of cars purchased for city service is about the same as for the years 1917, 1918 and 1919.

TABLE IV—ELECTRIC LOCOMOTIVES ORDERED DURING 1924

Name of Railway	Number	Weight, Tons	Length Over All, Ft. In.
New England States			
Aroostook Valley R.R.	1	60	35—9
New York, New Haven & Hartford R.R.	5	127	52—8
	2	87	39—0
	2	60	38—3
Springfield Terminal Ry.	1	50	35—9
Eastern States			
New York Central R.R.	7	100	37—0
	2	170	67—4
Pennsylvania R.R.	1	120	
Central States			
Ohio Public Service Co.	1	45	40—0
	1	65	45—0
South West Missouri R.R.	1	50	37—4
Western States			
Pacific Electric Ry.	5	63	32—0
Canada			
Niagara, St. Catherines & Toronto Ry.	2	55	35—4
Total	31		

TABLE V—RECAPITULATION BY DISTRICTS OF CARS ORDERED DURING 1924

	New England States	Eastern States	Central States	Southern States	Western States and Philippines	Total for United States	Total for Canada	Grand Total
Number of companies reporting new cars	8	36	36	14	18	112	7	119
City Service								
One-man cars, 28-ft. body	2	17	29	38	17	103	....	103
One-man cars other than 28 ft.								
Single truck	....	4	20	....	1	25	3	28
Double truck	....	31	9	25	2	67	1	68
One-man two-man cars	61	769	156	66	138	1,190	34	1,224
Two-man cars (surface)	....	18	101	20	113	252	27	279
Motor cars for rapid transit lines	8	150	100	....	....	258	....	258
Trailers	....	....	....	....	....	....	25	25
Service and miscellaneous cars	....	4	24	9	3	40	4	44
Total cars city service	71	993	439	158	274	1,935	94	2,029
Interurban Service								
One man cars, double truck	4	24	15	....	9	52	....	52
Single truck	1	1	7	....	....	9	....	9
One-man, two-man cars	....	26	12	....	....	38	....	38
Two-man cars	15	34	30	....	18	97	3	100
Trailers	....	....	4	....	....	4	....	4
Motor cars for train service	....	120	215	....	....	335	....	335
Express and freight cars	....	7	124	....	1,351	1,482	....	1,482
Miscellaneous cars	1	1	3	....	6	11	1	12
Total cars interurban service	21	213	410	....	1,384	2,028	4	2,032
Electric locomotives	11	10	3	....	5	29	2	31
Total cars and electric locomotives	103	1,216	852	158	1,663	3,992	100	4,092

The special comparison of cars ordered during the past 9 years, given in Table II, tabulates separately the cars for city service and those for interurban service. Referring to this table, it is interesting to note how the number of 28-ft. safety cars purchased increases each year from 1916 up to and including 1920, and during the same period how the number of large two-man cars shows a gradual decrease. Since that time the number of small safety cars purchased has decreased and the number of larger cars has increased considerably. The highest proportion for the small safety cars was reached in 1919, and since that time there has been a gradual return to the use of larger cars.

Details of rolling stock ordered by individual companies are given in Table III. The arrangement of this table this year is different from that used in preceding years in that in general the arrangement into groups follows one of the plans of grouping the states used by the United States Census Bureau. The railways in each state are arranged in a manner similar to that followed in previous years. Canadian companies are listed separately. In addition to listing the number of cars ordered by the various companies, this table shows the class of car and type of service and also gives length, seating capacity, weight and number of motors. The largest number of cars purchased by railways in any particular state was in New York, which includes 584 passenger cars for city service and 65 passenger cars for interurban service. Pennsylvania comes next with 332 passenger cars for city service and 45 cars for interurban operation.

The articulated type of car makes its first appearance in the list of cars ordered during 1924. The city of Detroit ordered one unit for surface operation and the Brooklyn-Manhattan Transit Corporation four units for rapid transit service. In addition to these, Brooklyn and Baltimore reconstructed cars to form articulated units.

Purchases of electric locomotives during 1924 are listed in Table IV. The total number of new electric locomotives is 31. The New York, New Haven & Hart-

ford and the New York Central were the largest purchasers, each having ordered nine.

The information which has been assembled and given in the accompanying tables of rolling stock was obtained from replies received to questionnaires sent to all electric railways in the United States and Canada. Replies were received from approximately 800 railways this year. With a fixed publication date it is quite impossible to receive the replies from all railways, but this year the answers have been particularly comprehensive and the information thus obtained has also been supplemented by items previously published in the ELECTRIC RAILWAY JOURNAL and also by very complete lists of car orders furnished by the principal car builders. Through the courtesy and co-operation of the various manufacturers, we have been able to check the figures obtained from the various railways very carefully, and in some cases where replies were not received from the railways themselves, the information furnished by the car manufacturers has been used.

More Financing on Better Terms

Many New Issues Placed With Investing Public Last Year—Sales Not Difficult to Make—Equipment Trusts on Increase—Buses Included Under Equipment Indentures—Issues Show Year's Accomplishments

PREDICTIONS made a year ago by bankers with respect to the prospects ahead for the satisfactory sale of securities by the electric railways during 1924 have been borne out by the developments of the year. Whereas for 1923 the total of new bond and note financing in amounts of $500,000 or more was only $20,867,000, the total this year is more than $85,000,000. In the same period of time 10 electric railways sold direct to the riding public more than $9,750,000 of securities. Of this amount $7,000,000 were for increases to capital investment to be used for additions, extensions and improvements. The remainder, amounting to $2,750,000, represents stock purchased in the open market by the electric railways and resold to employees and customers. With possibly a single exception, this past year is the first time that an attempt has been made to sell securities of the electric railways direct to the public. All these are securities of companies that do solely an electric railway business.

FINANCING DONE ON BETTER TERMS

Not only is the amount of bonds sold greater than last year, as has just been pointed out, but it has been possible for the electric railways to do their financing on much better terms. Money has been cheaper, but the entire answer is not to be found there. Rather is it to be found in the growing realization of the essentiality of the industry and its right generally to a living wage.

The biggest piece of electric railway financing in 1924 was that of the Market Street Railway, San Francisco. This was a refunding operation, carried out in January, 1924, to the amount of $13,000,000. The return of 7 per cent on this issue was the highest with possibly one exception of all the electric railway offerings of the year. From this liberal yield, the income to the investor tapered down to a return of 5.35 per cent on the 10-year Boston Elevated Railway 5½ per cent issue of $1,581,000 placed at 101.25 and interest. These yields, of course, apply in the case of the general financing and not to the financing covered by equipment trust obligations.

Best of all, the electric railway issues placed in 1924 found a ready market and many of them were snapped up by discriminating investors. One of the companies that participated in the large loans of the Market Street Railway said frankly in a discussion of traction securities intended to reach investors:

"We are taking advantage of the present unfriendliness of the market for street railway securities to obtain for our customers a bond which we are willing to recommend with absolutely no reservations as a conservative investment, giving a return from one-half to one full per cent above what can be obtained on securities of similar values. We do not deny that street railway bonds are still in disfavor; in fact, we would rather stress this disfavor than otherwise, because it is that very condition which enables us to do pioneering work in a neglected field and to obtain an attractive rate for our clients."

SIX-YEAR RECORD OF NEW ELECTRIC RAILWAY FINANCING INVOLVING BOND OR NOTE ISSUES OF MORE THAN $500,000

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

This is a very frank statement. It is very much to the point. As a matter of fact, the Market Street Railway offering was by far the largest of its kind made for a long time. There was a certain amount of sales resistance to be overcome in placing the issue. It was overcome and overcome most successfully. Within a comparatively short time the issue had all been placed.

GENERAL OUTLOOK GOOD

On one thing the bankers are agreed. This is that the adverse conditions of the railways in New York City do not weigh with them so much now as they did formerly. They are less prone to measure tractions elsewhere by the New York yardstick. It was generally agreed that the good public relations work has helped materially in strengthening the faith of the bankers in the electric railway situation. The occurrences of suspension of service by railways, notably the withdrawal of service in Akron and the subsequent passing of the new franchise grant there, have gone a long way to prove the essentiality of electric railway service. In this connection, it is interesting to note that the size of the property which seeks to place a security does not weigh heavily with the bankers. They look at situations individually and consider each case on its merits. Thus, at this time, one of the very largest houses has in prospect some electric railway financing to the amount of

only $700,000. The bankers took this issue because the railway has made a notable record in the past, and the issuing house feels confident that this property, interurban in character, can make as good a record of earnings in the future as it has in the past.

In this connection, one banker said that there has been much talk of the inroads of private automobiles on the suburban and interurban railways, but that while the effect of the increasing use of the private auto had undoubtedly been felt, still people pushing out into the country to live were certain to locate along the line of the railway and that not all of the members could use the automobile at the same time, except, perhaps, for certain pleasure riding. In other words, from an average family of five or six, the interurban railway will be sure to derive a large amount of riding during any given year.

Banker's Predictions Come True

But this is intended to be a record of the financing of the year. Not that the views of the bankers about the situation are not of great interest. They are. During the year, however, there was a series of notable papers on the economic outlook for electric railways and the prospects for financing. At the October convention T. N. Carver, C. W. Kellogg, Allen G. Hoyt, Fred Scheel and J. P. Harris all spoke about the outlook for the railways. Moreover, the financial condition of the industry was the topic at the afternoon session of the Midyear Meeting of the American Electric Railway Association at St. Louis on March 4. For the most part, these papers were economic in their treatment, but B. C. Cobb of Hodenpyl, Hardy & Company, did discuss the outlook for the future and referred to specific issues.

He said in conclusion that what he wanted to get into the minds of his hearers was that electric railway securities are now beginning to attract attention and many buyers heretofore not receptive are looking them up. He said that during the year up to the time he spoke the electric railways had all been successful in selling their bonds and short-term notes on a basis of from 6.25 per cent to 7 per cent in a highly competitive market. As he saw it the success of these companies undoubtedly would encourage others to enter the market, and as the public became acquainted with the improved financial condition of the electric railways the demand for their securities would increase. Is it logical, said he, that a railway bond issued by a road that is in a growing and prosperous community, one that earns more than two and one-half times its interest charges, should go begging? He said no; and when the investing public gets over its scare, it will not. The events of the year have proved Mr. Cobb to be correct. In fact, in the light of the events that have come to pass his words of last March were prophetic.

Big Increase in Equipment Trust Financing

A very interesting development of the year was the increasing extent to which resort was made to the use of equipment trust obligations in connection with the purchase of new equipment. The amount of these security offerings and other financial matters connected with them are shown in an accompanying table. Notable among such issues were those secured and made by the Pacific Electric Railway, Los Angeles; the Detroit United Railway, the Memphis Street Railway, the Louisville Railway, the Connecticut Company, the Pittsburgh Railways, the Philadelphia Rapid Transit Company and the Buffalo & Erie Railway.

PRINCIPAL ELECTRIC RAILWAY MATURITIES IN 1925
BASED ON DOW, JONES & COMPANY'S COMPILATION

Due		Corporation	Rate	Amount
Jan.	1	Toledo, Fremont & Norwalk R.R. 1st	6½	$1,115,000
Jan.	1	Nashville Street Ry. 1st	5	907,000
Jan.	1	Int. Rapid Trans. eq. tr. B	6½	450,000
Jan.	1	Reading & Womelsdorf E. Ry. 1st	5	400,000
Jan.	1	Eastern Mass. St. Ry. serial	6	300,000
Jan.	1	Wilkes-Barro & Wyom. Val. T. clt	5	245,000
Jan.	2	Jefferson Traction 1st	6	441,000
Jan.	15	Minn., Lyndale & Minnetonk Ry.	7	5,000,000
		January total		$8,858,000
Feb.	1	Metropolitan Railroad 1st	5	$1,809,000
Feb.	1	Schuylkill Electric Ry. 1st	6	293,000
Feb.	1	Phila. Rap. Transit eq. tr. G	5½	237,500
Feb.	1	Pittsburgh Rys. car tr.	6	200,000
		February total		$2,539,500
Mch.	1	Butte Electric Ry. 1st	5	$700,000
Mch.	1	Worcester Cons. St. Ry. ext.	7	700,000
Mch.	1	Berkshire Street Ry. deb.	5	200,000
Mch.	15	Inter. Rapid Transit eq. tr. A	6	280,000
		March total		$1,880,000
May	15	London (Ont.) Street Ry. deb.	5	$475,000
		May total		$475,000
June	1	Worcester & So'bridge St. Ry. 1st	4½	$200,000
June	15	Chi., Nor. Shore & Milw. 1-yr.	6	3,500,000
		June total		$3,700,000
July	1	Winnipeg, Selk & L. Winn Ry. ref.	5	$1,000,000
July	1	Winona Interurban Ry. 1st	5	750,000
July	1	Chatham, Wall & L. Erie Ry. 1st	5	694,500
July	1	Lima, Find & Toledo Ry. 1st	5	324,000
July	1	International Railway clt.	7	226,000
		July total		$2,994,500
Aug.	1	Galveston-Houston Elec. nts. A	7	$1,700,000
Aug.	1	Galveston-Houston nts. B	7	500,000
Aug.	1	Phila. Rapid Transit eq. tr. G	5½	237,500
		August total		$2,437,000
Nov.	1	Scranton Railway gen. ext.	7	$1,000,000
Nov.	1	Inter. Rapid Transit eq. tr. C	6	570,000
		November total		$1,570,000
Dec.	1	Phila. Rapid Transit 2-yr.	6	$3,500,000
Dec.	15	Phila. Rap. Transit eq. tr. H		270,000
		December total		$3,770,000
		Grand total		$28,224,000

The Louisville issue was placed with the public on a 6 per cent basis, the Memphis issue on a 6.25 per cent basis, the Pittsburgh issue on a 5.22 to 6 per cent basis, the Pacific Electric Railway issue on a 5.08 average yield, the Connecticut Company issue on a 6 per cent basis, the Detroit United issue on a 5 to 6 per cent basis, the Philadelphia Rapid Transit issue on a 4.74 per cent to 5.50 per cent basis and the Buffalo & Erie Railway issue on a 4½ to 6 per cent basis. Incidentally, the placing of these issues shows the growing tendency of the electric railways to modernize and merchandise. The saving in operating expenses through the use of thoroughly modern equipment is an important factor that often makes it possible for companies to amortize the purchase price of new equipment in a period of a comparatively few years.

A recapitulation of the equipment trust offerings shows that in the last year 617 cars have been bought and secured under this plan and a total of 272 motor buses have been similarly financed. Moreover, information obtained about the details of these offerings shows that the practice has been to pay not less than 25 per cent of the estimated cost of the equipment in cash, while in the Louisville case, the proportion in cash was about 40 per cent. The number of cars purchased by the Louisville Railway was not specified. The net cost of the equipment was $375,000, of which the Louisville Railway made a cash initial payment of $150,000. In

the case of the Memphis Street Railway the cost of equipment was $459,000, of which 25 per cent was paid in cash. This equipment consisted of 40 cars of the 55-passenger double-truck type. The cost of the equipment for the Pittsburgh Railways was more than $3,600,000. The company paid approximately $600,000, or 16 per cent in cash. This equipment consisted of 60 single-end, center-entrance, semi-convertible, double-truck, semi-steel cars, 16 semi-steel passenger cars, and 65 semi-steel cars of the one-man, two-man types.

The equipment for the Southern Pacific Company, according to estimates of the Railroad Commission of California, cost $1,632,039. Of this sum about $327,408, or 20 per cent, was paid in cash. The equipment here secured included five electric locomotives, 50 center-entrance steel cars, 12 one-man, two-man cars, and six electric motor coaches for interurban service.

In the case of the Connecticut Company the total cost of the equipment originally was $906,968. The equipment was bought in 1918 for the Connecticut Company with funds furnished by the United States Housing Corporation. Engineers reported the value of the cars at the time of the offering by the bankers in July was $770,000. The amount of the equipment trust issue in this case was $450,000, or approximately 60 per cent, showing that approximately 40 per cent had been paid in cash. Since 1915 the company has issued a total of $1,797,500 of equipment trust notes, on which $1,170,000 has been paid in July, 1924, leaving $627,500 outstanding at that time. The equipment secured by this issue was 50 convertible steel passenger cars, with a capacity of 56 passengers each, and 20 convertible steel passenger cars with a capacity of 32 passengers each.

The Detroit United equipment cost $1,630,000, of which $330,000 was paid in cash. In offering this issue for public subscription the bankers emphasized the fact that 52 per cent of the certificates matured during the first 3½ years. The equipment secured by the deed of trust in this case consists of eight heavy interurban cars, six interurban passenger chair cars, 15 double-truck, 52-passenger one-man cars, 50 trail box cars, 25 single-deck, 29-passenger buses, 10 double-deck buses and 40 29-passenger single-deck, four-cylinder coaches.

The Philadelphia Rapid Transit Company equipment cost $3,772,000. The par value of the certificates represents approximately 75 per cent of the entire cost of the railway cars, but less than 70 per cent of the cash cost of motor vehicle equipment. This equipment consists of 100 standard double-truck cars, 125 double-deck motor coaches, 77 single-deck motor coaches, and 11 service trucks.

The Buffalo & Erie Railway equipment will cost not less than $285,000, which is more than 142 per cent of the face value of the certificates. The issue will be secured by deposit with the trustee of 14 double-truck passenger cars, four single-truck passenger cars and two snowplows. The 18-passenger cars are to be of the "Lexington" type designed for high-speed service.

NOT ALL EQUIPMENT TRUSTS WERE PLACED DIRECT WITH PUBLIC

By no means do the figures for equipment trusts issued to the public cover the total of financing of this kind. There is every reason to believe that there was a fairly larger volume of purchases financed by means of similar obligations placed direct with the car build-

DETAILS OF NEW BOND AND NOTE FINANCING IN AMOUNTS OF MORE THAN $200,000 OFFERED PUBLICLY DURING 1924

Issue	Sale Price	Maturity	Yield	Amount
JANUARY				
Louisville Railway car trust 6 per cent gold certificates	100 and interest	Serially 1924–1934	6	$230,000
Market Street Railway first mortgage 7 per cent sinking fund bonds	100 and interest	1940	7	13,000,000
Philadelphia Rapid Transit Company real estate first mortgage 6 per cent	100 and interest	1944	6	2,500,000
Memphis Street Railway equipment trust 6 per cent certificates	100 to 98.16 and interest	Serially 1924–1933	6 to 6.25	344,000
Maryland Electric Railways 6½ per cent first and refunding mortgage gold bonds	100 and interest	1957	6½	4,000,000
MARCH				
Boston Elevated Railway 6 per cent gold bonds	103 and interest	1933	...	3,000,000
Key System Transit Company first mortgage 6 per cent bonds	99½ and interest	1938	6.05	2,500,000
APRIL				
Key System Transit Company general and refunding mortgage 5 per cent	78 and interest	1938	7.75	1,118,000
Holyoke Street Railway first mortgage 6 per cent bonds	102 and interest	1938	5.75	550,000
West Penn Railways 6½ per cent gold debentures	99 and interest	1927	6.87½	3,500,00.
Grand Rapids Railway 7 per cent sinking fund gold bonds	99½ and interest	1939	7+	3.2 0,000
North Hudson County Railway Improvement mortgage 5 per cent bonds (Public Service Ry.)	See note (a)	(b) 1926	6	1,291,000
Pittsburgh Railways 6 per cent car trust bonds	100.50 to 100 and interest	1925–1939	5.22 to 6	3,000,000
(a) Pacific Electric Railway 5 per cent equipment trust certificates	99½ and interest	1925–1939	5.08 av. yield	1,305,600
JUNE				
Chicago Rapid Transit Company first and refunding mortgage, 6½ per cent gold bonds	94½ and interest	1944	7+	6,500,000
Hestonville, Mantua & Fairmount Passenger Railroad 5½ per cent gold bonds	100 and interest	(c) 1934	5½	1,250,000
Detroit United Railway first mortgage and collateral trust bonds	99 and interest	1929	6.20	9,000,000
Chicago, North Shore & Milwaukee Railroad 6 per cent gold notes	.....	1924	....	3,500,000
JULY				
Boston Elevated Railway ten-year 5½ per cent gold bonds	101.25 and interest	1934	5.35	1,581,000
Connecticut Company 6 per cent equipment trust 6 per cent gold notes	100 and interest	Serially 1924–1934	6	450,000
Winona Service Company (Winona Interurban Railway)	.....	.....	.....	600,000
OCTOBER				
Chicago Rapid Transit Company first and refunding mortgage 6½ per cent bonds	94½ and interest	1944	7 (d)	2,500,000
Minneapolis Street Railway 5½ per cent gold notes	100 and interest	1928	5½	5,000,000
NOVEMBER				
Erie Railways 6 per cent gold bonds	95 and interest	1954	6½	1,000,000
Detroit United Railways equipment trust 6 per cent certificates	100.40 to 100	1925 to 1934	5 to 6	1,000,000
DECEMBER				
Montreal Tramways first and refunding mortgage 5 per cent bonds	95 and interest	1941	5.45	3,266,000
Philadelphia Rapid Transit Company 5½ per cent equipment trust certificates	100.75 to 100	Serially 1925–1934	4.75 to 5.50	2,700,000
Chicago, North Shore & Milwaukee Railroad first and refunding mortgage 6 per cent (series A)	98 and interest	1955	6.15	7,000,000
Buffalo & Erie Railway equipment trust gold certificates	100 to 100½	1925–34	4½ to 6	200,000
Total	.....	.....	.....	$84,884,600

(a) Extended at 101 per cent with option to holder to redeem at par.
(b) Extended from 1924.
(c) Extended issue.
(d) Total issue $17,640,000 and included five electric locomotives, 50 center-entrance steel street cars, 12 one-man steel street cars and six electric motor coaches, estimated by State Railroad Commission to cost $1,632,039, but mortgaged for 80 per cent of purchase price.

ers. For instance, the Richmond Light & Railroad Company, Staten Island, is known to have executed car trust certificates to the amount of $250,000 direct to the car builders in part payment for new rolling stock. In this case twenty double-truck cars found to be unsuitable for meeting present conditions were replaced with 25 one-man, two-man cars. The cost of this equipment was $334,375. These certificates bear interest at the rate of 6½ per cent and the company agreed to redeem them at the rate of $25,000 a year. In this case a financial expert retained by the company reported that in view of the relatively small number of the equipment units upon which the proposed issue of the certificates would be placed, and considering the not so well standardized and stabilized type of equipment in the electric street railways, as evidenced by this present specific instance of the proposed retirement of cars which are by no means old or worn out, an interest rate as low as upon trunk-line railroad equipment could not reasonably be expected. It is reasonable to assume, said this authority, that the management of this company has obtained the lowest rate which in the exercise of business judgment it has been able to negotiate.

A somewhat similar case was presented in Trenton. There approval was granted in August by the Board of Public Utility Commissioners to the car trust agreement entered into on July 8 by the Trenton & Mercer County Traction Corporation, Trenton, N. J., with the J. G. Brill Company. In the same action the board authorized the railway to issue 10 serial notes aggregating $409,943. Of this amount $242,122 is listed as the principal and $70,821 as the interest thereon. The application of the railway to the commission was the outgrowth of the corporation's plan to add 20 new cars to the service—an improvement already approved by the commissioners.

Tendency to Strengthen Sinking Fund Requirements

Another change noted during the year was the tendency to increase the sinking fund provisions. Both the San Francisco refunding issue and the Detroit equipment issues illustrate this. These are all matters of public record. In the San Francisco case the company has covenanted to provide a sinking fund of $500,000 a year from Jan. 1, 1925, through 1932. Bonds are to be purchased in the open market at not to exceed their redemption prices, or if not so obtainable to be recalled and kept alive until Jan. 1, 1933, and their interest used to acquire additional bonds. The bonds then held in the sinking fund will be canceled and thereafter the company will provide a quarterly sinking fund of $300,000 a year until maturity for like purchase or redemption. The bonds acquired will be kept alive and the interest thereon will be added to the sinking fund. The operation of the sinking funds, assuming bonds retired at call price, will reduce this issue to $8,075,000 on Jan. 1, 1933, and to $5,460,000 on Jan. 1, 1940. Proceeds from the sale of any mortgage property are to be added to the fixed sinking payments.

On the other hand, the Maryland Electric Railway issue calls for a sinking fund of 1 per cent of all the first and refunding mortgage bonds, series A, from time to time outstanding. The first payment is to be made on Jan. 1, 1925. This is in addition to a fund of not less than 1 per cent per annum for improvements, depreciation and obsolescence. In the $6,500,000 Chicago Rapid Transit issue, the sinking fund does not begin to operate until Jan. 1, 1929, but on the first days of January and July of that year and on the similar days each year thereafter an amount equal to one-half of 1 per cent of the total amount of the bonds must be provided for the sinking fund. In the case of the Boston issue of $1,581,000 emphasis was laid on the fact that the company is charging 24 per cent of the total railway revenue to maintenance and depreciation. The mortgage by which the $7,000,000 of the Chicago, North Shore & Milwaukee Railroad first and refunding bonds are secured provides for a sinking fund beginning Dec. 1, 1925, with semi-annual payments equal to one-half of 1 per cent of the principal amount of the bonds then outstanding under the mortgage and underlying bonds at such times in the hands of the public.

Financing of Special Improvements Arranged

It will be recalled that in the review of the financial situation in the ELECTRIC RAILWAY JOURNAL for Jan. 5, 1924, reference was made to the possibility of the railways making loans on a particular improvement, especially when such improvement involved the development of real estate. It was explained at that time that the carhouse, shop or terminal might be financed by a distinct loan where the buildings were located where there was a real chance of appreciation in land value. In this connection, it is interesting to note that loans along these lines were brought out during the year by both the Indianapolis & Cincinnati Traction Company and the Philadelphia Rapid Transit Company.

The Indianapolis & Cincinnati Traction Company was anxious to rehabilitate the entire line, but the matter of finances presented an obstacle which was considered insurmountable by many who analyzed the situation. A plan, however, was finally devised by President Charles L. Henry for extending the principles of the equipment trust method commonly used for financing the purchase of rolling stock to include substation equipment and feeder lines as well. J. F. Wild & Company, a local investment banking firm, agreed to finance the project on the basis of such an equipment trust through the sale of securities to the amount of 80 per cent of the total required, provided that the remaining 20 per cent could be raised in such a way that these securities became a first lien on the total amount of the trust equipment. The necessary additional 20 per cent was advanced by a small group of bondholders of the road who had faith in the ultimate result of the improvement and agreed to accept a second lien as security, in order to make the improvement possible. Preferred stock paying 6 per cent was issued by an intermediate company through which the details of the matter were arranged. The stock comprises two series, covering the 80 per cent first lien and the 20 per cent second lien, respectively. As explained in the elaborate series of articles the first of which was published in the ELECTRIC RAILWAY JOURNAL for July 26, page 113, these securities were all handled on a 10 per cent brokerage basis, and the total funds required were banked before any orders were placed with the manufacturers.

Extension of the equipment trust method of financing to the purchase of substation and feeder equipment made it important to avoid any questions or complications as to title to substation buildings or equipment. This was done by purchasing land sites adjacent to the railway right-of-way for the erection of the substation buildings. Although each of the new stations adjoins an old transformer station which was suitable physi-

cally for conversion into a rotary converter substation, the question of complication in title made it desirable to adopt the plan of purchasing sites off existing railway property and erecting new buildings. However, by making the new structures as simple as possible, consistent with security and fireproof construction, the total cost of land and buildings was held to within $20,000 of the estimated cost of making changes in existing transformer station buildings.

All feeder cable strung along the right-of-way on the railway's poles, as well as other property purchased with equipment trust funds, was plainly tagged at frequent intervals for identification. Annual rental and installment payments by the railway are to be made at a rate which will wipe out the total cost of the new equipment at the end of ten years.

The Philadelphia Rapid Transit Company loan was strictly a real estate first mortgage in which an issue of 6 per cent bonds was secured by a first mortgage on three modern car terminals of brick and concrete construction advantageously located in the northern, central and southern sections of the city of Philadelphia. It was explained that the terminal properties on which these bonds were secured by a first mortgage had a value of $4,083,040, and that the real estate itself had a value of $1,720,000, making a total real estate value for all of the property of more than $5,800,000.

Reference has been made to the fact that the $2,098,000 of the Boston Elevated Railway 6 per cent 10-year bonds was sold at 103 and interest to yield about 5.60 per cent. The Boston Elevated Railway is under public management and operation, pursuant to an act of the Legislature of Massachusetts. This is regarded as having a favorable effect on the prices at which the company is able to do its financing. Aside from this, however, early in the present year, the road's bonds for the first time in 5 years had the advantage of a savings bank market. In other words, the bonds were returned to the so-called legal list. In 1905 the company was able to dispose of an issue of $7,500,000 bearing 4 per cent interest at 103.692.

In 1923 the largest maturity was $13,115,000 of secured notes of the New England Investment & Security Company. This issue came due last April. The total originally was $16,250,000 issued to the New York, New Haven & Hartford in 1909 in settlement for repairs and other work. Since then $3,135,000 has been received and canceled. This is largely an intercompany matter and it is understood that the refunding or extension of these notes will soon be ready for consideration. The Market Street Railway refunding issue has been referred to before. The $1,500,000 of bonds of the Boston Elevated Railway which became due on March 1 were refunded and were included in the issue of $2,098,000 of 10-year 6 per cent bonds issued at that time. The $5,098,000 additional bonds were to cover expenditures on new shops in Everett. The $1,581,000 of bonds which became due on Aug. 1, 1924, were refunded by a like amount of 10-year 5½ per cent bonds on that date. The first and refunding mortgage 4 per cent bonds of the Hoosac Valley Street Railway which matured on Sept. 1, 1924, were extended to Sept. 1, 1929, with interest at 7 per cent per annum.

As for the issues of stock sold direct to the investing public the more of these issues that are safely held by the public the better it will be for the electric railway. The investment bankers are agreed upon this. There are elements of danger, however, in such sales. This was forcefully brought out by Ralph S. Child of Bonbright & Company in his statement on customer ownership made before the New Jersey Public Utility Association and abstracted in the ELECTRIC RAILWAY JOURNAL for Dec. 6, page 967. His advice is so pertinent and so recent that it has seemed advisable to repeat in part what he said:

"It is vitally necessary to the continuance of the strong position of the public utility industry that there be no failure in the payment of dividends on the part of any company which has sold preferred stock to its customers. Should such a failure occur it would reflect on the entire industry and might bring out complications which would be very far-reaching and possibly have disastrous results."

The electric railways are looking ahead. As a matter of fact they are taking some pages out of the book of experience of the steam railroads by resorting to the use of the blanket open-end mortgage to permit financing to be carried on continually with the end in view of eventually having probably one general lien upon the property. Thus early in November creation of a $7,000,000 first and refunding issue was approved by the Worcester Consolidated Street Railway as a means of anticipating securities which mature in 1925 and at subsequent dates. Next year this company will have to meet $700,000 in maturities and within the next three years a total of $3,083,000 in maturities. This was a purely constructive move on the part of the railway in keeping up with the general financial tendency in recent years in connection with such matters, for it has been left to the directors to sell the bonds in series with different coupon rates, depending entirely upon the state of the bond market at the time the money is needed.

Among the banks and investment houses which have participated as principals in the work of placing the various issues of electric railway companies with the public during 1924 there appear the following names:

HOUSES OF ISSUE

Louisville—Fidelity & Columbia Trust Company.

San Francisco—Wells Fargo Bank & Union Trust Company; Anglo & London Paris National Bank.

New York—Dillon, Read & Company; Ladenburg, Thalmann & Company; Harris, Forbes & Company; Alexander Brown & Sons; E. H. Rollins & Sons; Remick, Hodges & Company; Paine, Webber & Company; Halsey, Stuart & Company; Federal Securities Corporation; Spencer Trask & Company; Hodenpyl, Hardy & Company; Bonbright & Company; Kuhn, Loeb & Company; the National City Company; Curtis & Sanger; White, Weld & Company; Blodgett & Company; Myron S. Hall & Company.

Philadelphia — Drexel & Company; Harper & Turner; Bown & Company.

Pittsburgh—Union Trust Company.

Hartford—Putnam & Company.

Indianapolis—Aetna Trust & Savings Bank; J. F. Wild & Company.

Detroit—Watling, Lurchen & Company.

Cleveland—Union Trust Company.

It is only fair to say that many of the facts previously set down would not have been possible to obtain except for the help of the bankers themselves. They gave freely of their time to supply facts for the article and made many constructive suggestions. In particular, acknowledgment is made to the officers of the National City Company, New York, who placed their own records at the disposal of the ELECTRIC RAILWAY JOURNAL in connection with the work of preparing the table of security issues placed with the public during the year.

$117,000,000 Less Involved in Roads Now in Receivership

Financial Affairs of Eighteen Companies Straightened Out During the Year — Twelve Companies Thrown into Receivership — Mileage Operated by Receivers Is Decreased 338 Miles from That at End of 1923

DURING the past year the financial status of electric railways has been generally favorable. This has been reflected even in the weaker properties. In fact, the situation was so good in the earlier part of the year that it appeared that the number of receiverships for the year and the value of the securities involved would be less than for 1923. The uncertainty due to the developments of the Presidential campaign, particularly with the dire prophecies of results to follow the election of a radical candidate, caused a falling off in general business that was nation-wide. Incidentally there was a loss in electric railway traffic great enough that some of the weaker roads were unable to withstand the pressure, and receiverships resulted.

Even with the general situation as it was, the record would have been almost as good as that for last year had not application been made for a receiver for the Union Traction Company of Indiana in the closing hours of 1924. This road, an important property, which consists of 455 miles of interurbans in central Indiana, is capitalized at $26,181,000. Adding it to the list of new receiverships threw the totals, both for the amount of track and the securities involved, considerably above those for 1923. It also brought the total number of companies thrown into receivership during the year up to 12, or the same number as for the year previous.

Next to the Union Traction Company in size among those entering receivership during the year is the Michigan Railroad, which operates 159.44 miles of interurban railway in southern Michigan. The securities involved total $12,050,000. Other important roads going into receivership were the Joplin & Pittsburg Railway, with 94.52 miles of track and $10,078,500 of securities, and the Columbus, Newark & Zanesville Railway, with 91.05 miles and $6,729,000 of securities. All told, the 12 companies include 1,022 miles of track and $64,000,000 of securities.

Included along with the list of railways in receivership is listed the Charleston-Isle of Palms Traction Company, Charleston, S. C. Technically, however, this road is not in receivership as a trustee has been appointed instead. The procedure is only slightly different, however, and the road is being reorganized, so that for that reason it has been put in the table.

Contrasted with this, the financial difficulties of 22 companies were straightened out in whole or in part. In 18 of these cases the receiverships were terminated, the companies totaling 1,608 miles of track and $174,000,000 in securities. The net result of the receivership operations is thus decidedly favorable, the properties released to their owners representing nearly three times as much capital as those that went into receiverships.

The leading property to have the receivership terminated during the year was the Pittsburgh Railways. This city property, with 600 miles of track and $94,000,000 of securities, was put in such excellent condition by the receiver that it was possible to return it to its original owners without the necessity for a reorganization. In the period of the receivership, which lasted nearly 6

ELECTRIC RAILWAY RECEIVERSHIPS—1924

	Miles of single track involved	Outstanding Securities — Stocks	Outstanding Securities — Bonds	Outstanding Securities — Receivers' Certificates
United Traction Co. of Ind., Anderson, Ind.	455.0	11,500,000	14,681,000	None
Kansas City, Kaw Valley & Western Ry. Co., Bonner Springs, Kans.	42.31	73,500	1,374,500	None
Joplin & Pittsburg Ry. Co., Pittsburgh, Kans.	94.52	$7,000,000	$3,078,500	None
Milford, Attleboro & Woonsocket Street Ry. Co., Milford, Mass.	29.73	315,000	300,000	None
Grand Rapids, Holland & Chicago Ry., Holland, Mich.	76.40	1,324,700	1,500,000	None
Michigan Railroad Co., Jackson, Mich.	159.44	4,000,000	8,050,000	None
Ithaca Traction Corporation, Ithaca, N. Y.	11.47	400,000	763,000	None
Long Island Electric Ry Co., New York, N. Y.	24 97	600,000	600,000	None
Port Jervis Traction Co., Port Jervis, N. Y.	4.78	30,000	70,000	None
Maumee Valley Ry. Co., Perrysburg, Ohio	23.21	7,500	345,000	None
Columbus, Newark & Zanesville Ry. Co., Springfield, O.	91.05	2,025,000	4,704,000	$190,000
Charleston—Isle of Palms Traction Co., Charleston, S. C.	9.00	527,000	250,000	.....
Total for 1924 (13 companies)	1,021.88	28,489,700	35,716,000	190,000

TABLE I—RECORD OF ELECTRIC RAILWAY RECEIVERSHIPS

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities — Stock	Outstanding Securities — Bonds
1909	22	558.00	$29,962,200	$22,325,000
1910	11	696.61	12,629,400	75,490,735
1911	19	518.90	29,533,450	38,973,293
1912	26	373.58	20,410,700	11,133,800
1913	18	342.84	31,006,900	47,272,200
1914	10	362.39	35,562,550	19,050,460
1915	27	1,152.10	40,298,050	39,372,375
1916	15	359.26	14,476,600	10,849,200
1917	21	1,177.32	33,918,725	33,778,400
1918	29	2,017.61	92,130,388	163,257,102
1919	48	3,781.12	321,259,354	312,915,104
1920	19	1,065.31	28,758,455	72,283,575
1921	19	986.42	32,909,525	36,177,800
1922	14	695.43	18,140,150	20,304,400
1923	12	333 63	8,332,100	14,707,066
1924	12	1,021.88	28,489,700	35,716,000

TABLE II—RECORD OF ELECTRIC RAILWAY FORECLOSURE SALES

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

(a) Data not available.

Table IV—Electric Railway Receiverships as of Dec. 31, 1924

Name of Company	Year of Receivership	Miles of Single Track Involved	Outstanding Securities: Capital Stock	Funded Debt	Receivers' Certificates
New England District					
CONNECTICUT					
Danbury & Bethel St. Ry., Danbury	1917	13.00	$320,000	$588,500	$100,000
Hartford & Springfield St. Ry., Hartford	1918	48.00	785,000	961,000	None
MASSACHUSETTS					
Connecticut Valley St. Ry., Greenfield, Mass.	1921	47.05	620,000	580,000	10,000
Northern Massachusetts St. Ry., Greenfield, Mass.	1921	44.09	500,000	500,000	40,000
Milford, Attleboro & Woonsocket St. Ry., Springfield	1924	29.73	315,000	300,000	None
NEW HAMPSHIRE					
Portsmouth, Dover & York St. Ry., Portsmouth (1)	1917	12.00	.....	707,000	30,000
VERMONT					
Barre & Montpelier Trac. & Pwr. Co., Montpelier	1920	9.75	120,000	100,000	None
Net receiverships Dec. 31, 1924	7 cos	203.62	$2,660,000	$3,736,500	$180,000
North of the Ohio and East of the Mississippi					
ILLINOIS					
Alton, Granite & St. Louis Trac. Co., Alton	1920	62.00	$3,189,000	$5,000,000	None
Chicago & Interurban Trac. Co., Chicago	1922	50.00	1,000,000	1,350,000	None
Peoria Ry. Terminal Co., Peoria	1922	11.40	1,000,000	2,444,000	None
INDIANA					
United Traction Co. of Indiana, Anderson	1924	455.00	11,500,000	14,681,000	None
Beech Grove Trac. Co., Beech Grove	1917	3.90	150,000	100,000	None
Ft. Wayne, Van Wert & Lima Trac. Co., Ft. Wayne	1921	61.63	1,000,000	1,470,000	None
MICHIGAN					
Grand Rapids, Holland & Chicago Ry., Holland	1924	76.40	1,324,700	1,500,000	None
Houghton County Trac. Co., Houghton	1921	32.15	957,200	660,000	None
Michigan R.R., Jackson	1924	159.44	4,000,000	8,050,000	None
NEW JERSEY					
North Jersey Rapid Transit Co., Hohokus	1912	18.00	800,000	800,000	None
Morris County Trac. Co., Morristown	1923	68.98	300,000	4,193,066	None
NEW YORK					
Buffalo & Lackawanna Trac. Co., Buffalo	1918	8.80	55,000	1,000,000	None
Hamburg Railway, Buffalo	1920	21.72	(2)	(2)	None
New York & Long Island Trac. Co., Hempstead	1923	50.76	1,000,000	1,000,000	None
Hornell Trac. Co., Hornell	1917	10.90	117,900	150,000	2,000
Ithaca Trac. Corp., Ithaca	1924	11.62	400,000	763,000	None
New York & Queens County Ry., Jackson Heights	1923	43.65	3,235,000	1,500,000	None
Manhattan & Queens Trac. Corp., Long Island City	1917	21.20	20,000 (3)	2,090,000 (4)	None
Brooklyn Heights R.R., Bklyn.	1919	5.12	200,000	250,000	None
Long Island Elec. Ry., New York	1924	24.97	600,000	600,000	None
Steinway Ry., Long Island	1922	31.11	None	1,500,000	None
New York Rys., New York	1919	80.00	17,495,060	48,699,175	None
Staten Island Midland Ry., New York (7)	1920	28.68	1,000,000	1,000,000	3,000
Second Ave. Ry., New York	1908	26.35	1,862,000	5,720,000	3,140,000
Ogdensburg St. Ry., Ogdensburg	1922	7.74	150,000	150,000	None
Penn Yan & Lake Shore Ry., Penn Yan	1918	8.50	94,000	100,000	None
Port Jervis Trac. Co., Port Jervis	1924	4.78	30,000	70,000	None
Westchester St. R.R. Co., White Plains	1920	17.92	700,000	168,000	17,400
OHIO					
Cincinnati, Lawrenceburg & Aurora Elec. St. R.R., Cincinnati	1913	31.67	808,900	750,000	None
Dayton, Springfield & Xenia So. Ry., Dayton	1923	27.97	500,000	422,400	None
Cincinnati and Dayton Trac. Co., Hamilton	1920	91.07	1,250,000	3,250,000	25,000
Cleveland, Alliance & Mahoning Valley R.R., Ravenna	1920	46.00	1,100,000	1,100,000	8,000
Dayton, Covington & Piqua Trac. Co., West Milton	1922	34.00	1,150,000	550,000	18,000
The Hocking-Sunday Creek Trac. Co., Nelsonville	1923	14.99	223,000	300,000	None
Columbus, Newark & Zanesville Trac. Co., Springfield	1924	91.05	2,025,000	4,704,000	190,000
Indiana, Columbus & Eastern Trac. Co., Springfield	1921	201.49	4,025,000	7,900,000	200,000
Toledo & Western R.R., Toledo (5)	1921	89.00	2,000,000	2,000,000	None
Ohio River Elec. Ry. & Power Co., Pomeroy (7)	1919	12.70	300,000	315,000	None
Maumee Valley Ry., Perrysburg (7)	1924	23.21	1,000,000	800,000	None
PENNSYLVANIA					
North Branch Transit Co., Bloomsburg	1915	30.00	500,000	532,500	83,000
Slate Belt Transit Co., Pen Argyl	1922	18.00	180,000	180,000	None
Net receiverships Dec. 31, 1924.	41 cos.	2,114.87	$67,241,760	$125,812,141	$3,686,400
South of the Ohio and East of the Mississippi					
DISTRICT OF COLUMBIA					
Washington-Virginia Ry.	1923	40.00	$2,378,300	$5,614,000	None
FLORIDA					
Jacksonville Trac. Co., Jacksonville	1919	65.00	1,500,000	3,270,200	$98,469
Pensacola Elec. Co., Pensacola.	1920	24.49	1,100,000 (6)	1,721,770 (6)	None

(1) Remainder of property scrapped.
(2) Merged with Buffalo & Lake Erie Traction Company in 1906.
(3) Subscription rights only.
(4) Unfunded debt.
(5) Property has been sold, but receiver not yet discharged.
(6) Figures for total property. Railway value cannot be separated.
(7) As included in last year's report.

years, a great deal of important rehabilitation work was carried out and the road was modernized in nearly every department, so that it is today in far better condition than when it was thrown into receivership in 1918.

Another important road to emerge from receivership was the Cleveland, Southwestern & Columbus Railway, an interurban running out of Cleveland. This property was sold and reorganized as the Cleveland Southwestern Railway & Light Company. The difficulties of the Buffalo & Lake Erie Traction Company were finally adjusted, the property being reorganized after a foreclosure sale. In this case the interurban section of the road, operating between Buffalo, N. Y., and Erie, Pa., was segregated from the city property in Erie, two separate companies being formed. The Birmingham Railway, Light & Power Company and the Birmingham-Tidewater Railway, which have been in receivership since 1919, were reorganized as the Birmingham Electric Company.

The affairs of the Ohio Electric Railway, which went into receivership in 1921, have finally been wound up with the organization of the Lima-Toledo Railroad.

Of the companies which remain in receivership, the principal ones are two Missouri properties, the United Railways of St. Louis and the Kansas City Railways. The former has 461 miles of track and the latter 315 miles. Several times during the past year it has seemed probable that the roads would be restored to their owners, but each time the negotiations have been held up. Both properties have been making good showings, and in both cases large sums have been spent in rehabilitation, so that physically they are in excellent shape. It seems entirely probable that both properties will come out of receivership during the present year.

Another good-sized city property remaining in receivership is the Denver Tramway. In this case also the lifting of the receivership has been deferred. Negotiations are progressing, however, and there is some possibility of terminating the difficulties of the property. The principal difficulty has been in reaching an agreement as to the valuation between the owners of the securities and the city.

The only other property of over 100 miles included in the list is the Indiana, Columbus & Eastern Traction Company, which has been in

receivership since 1921. This is an interurban line in Ohio and Indiana which operates over 200 miles of track. Conditions have not been so favorable in this case as in the ones previously mentioned, and it is doubtful if the affairs of the receiver who has this property in charge can be wound up during the present year.

The readjustment of transportation methods is still going on, as is evidenced by the abandonments of railway lines. Altogether 23 properties totaling 225.52 miles abandoned their tracks during the year. Nearly all of these are small interurban lines which have felt the pressure of competition with buses and private automobiles so keenly that they have not been able to make expenses and interest on the funded securities. Four of these roads were over 20 miles in length, the longest being the Milford, Woonsocket & Attleboro Street Railway of Springfield, Mass., with 29.75 miles. The other three in this classification were the Shore Line Electric Railway of Norwich, Conn., 28.22 miles; the Pennsylvania & Ohio Traction Company of Ashtabula, Ohio, 24 miles; and the Norwalk & Shelby Railroad of Norwalk, Ohio, 24 miles. These four roads comprise over half the abandoned track for the year.

The San Francisco-Oakland Terminal Railways, which was sold at foreclosure at the end of 1923, and which was included in last year's table of receiverships, did not, in fact, require the appointment of a receiver. It was reorganized early in 1924 as the Key System Transit Company.

As is inevitable in preparing statistics of this sort, information is sometimes not available to complete the tables for the year. This is particularly true in the case of roads that have passed through receivership, as the officials of the original companies as well as the receivers have ceased their duties when the receiverships terminated and turned their duties over to new owners. Information received this year shows that there were several companies whose affairs were

Table IV—Receiverships as of Dec. 31, 1924 (Concluded)

Name of Company	Year of Receivership	Miles of Single Track Involved	Outstanding Securities: Capital Stock	Outstanding Securities: Funded Debt	Outstanding Securities: Receivers' Certificate
GEORGIA					
Valdosta St. Ry., Valdosta.....	1922	5.00	50,000	1,500	383
KENTUCKY					
Owensboro City R.R., Owensboro	1923	12.50	75,000	400,000	None
NORTH CAROLINA					
Alamance Ry., Burlington (8)..	1923	8.40	60,000	120	None
SOUTH CAROLINA					
Charleston-Isle of Palms Trac. Co., Charleston.....	1924	9.00	527,000	250,000	.....
Net receiverships Dec. 31, 1924.	7 cos.	164.39	$5,690,300	$11,257,590	$98,852
West of the Mississippi					
COLORADO					
Denver Tramway Co., Denver..	1920	226.14	$6,156,300	$17,351,710	None
KANSAS					
Joplin & Pittsburg Ry., Pittsburg	1924	94.52	7,000,000	3,078,500	None
Kansas City, Kaw Valley & Western Ry., Bonner Springs.	1924	42.31	740,500	1,374,500	None
MINNESOTA					
St. Paul Southern Elec. Ry., Hastings.....	1918	17.54	658,225	425,400	None
MISSOURI					
Kansas City, Lawrence & Topeka Elec. Ry., Kansas City..	1919	12.00	250,000	400,000	None
Kansas City Rys., Kansas City.	1920	314.88	(9) 100,000	30,032,336	None
Missouri Elec. R.R., St. Louis..	1919	18.91	1,000,000	700,000	None
United Railways Co. of St. Louis	1919	460.93	41,296,000	50,690,000	4,200,000
Net receiverships Dec. 31, 1924.	8 cos.	1,187.23	$56,201,025	$104,052,446	$4,200,00
RECAPITULATION FOR UNITED STATES					
Net receiverships Dec. 31, 1924.	63 cos.	3,670.11	$131,793,085	$244,858,677	$8,165,25

(8) Property being dismantled July 1, 1924. (9) No par value. Nominal value of stock given.

Table V—Receiverships Terminated and Foreclosure Sales During 1924

Receivers Discharged With or Without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Outstanding Securities: Stocks	Outstanding Securities: Bonds	Outstanding Securities: Receivers' Certificates	Remarks
Birmingham Railway, Light & Power Co., Birmingham, Ala	154.70	$4,232,800	$8,737,872	$397,388	Reorganized as Birmingham Electric Co.
Birmingham Tidewater Railway, Birmingham, Ala.	31.25	325,000	1,500,000	None	
Shore Line Electric Ry., Norwich, Conn.....	28.22	1,000,000	2,725,000	None	Abandoned.
Chicago & Oak Park Elevated R.R., Chicago, Ill.	22.66	100,000	6,148,863	$2,210,000	Purchased by Chicago Rapid Transit Company at foreclosure sale.
DeKalb-Sycamore & Interurban Traction Co., DeKalb, Ill.....	6.5	.....	.....	.....	Abandoned. Data not available.
Winona Interurban R.R., Warsaw, Ind.....	70.0	750,000	2,343,700	None	Sold by receiver, reorganized as Winona Service Co.
Atlantic Shore Ry., Kennebunk, Me.....	49.93	1,000,000	1,746,250	None	Sold at foreclosure sale in 1923. Receiver discharged in 1924.
Concord, Maynard & Hudson St. Ry., Greenfield, Mass.....	18.15	235,000	230,000	None	Receiver discharged (Road abandoned in 1923).
Binghamton Railway Co., Binghamton, N. Y....	50 25	978,995	2,576,950	None	Receiver discharged.
Coney Island & Brooklyn R.R., Brooklyn, N. Y..	52.88	2,983,900	6,232,000	None	Receiver discharged.
Pennsylvania & Ohio Trac. Co., Ashtabula, Ohio.	24.00	.....	.....	.....	Abandoned. Data not available.
Cleveland, Southwestern & Columbus Ry., Cleveland, Ohio.....	185.0	4,000,000	4,500,000	None	Sold and reorganized as Cleveland, Southwestern Railway & Light Co.
Lima-Toledo R.R., Lima, Ohio.....	82.90	11,000	7,254,000	None	Final portion of property of Ohio Electric Railway taken over by sale to the Lima-Toledo R.R. Co.
Norwalk & Shelby R.R., Norwalk, Ohio.....	24.00	125,000	150,000	None	Abandoned.
Northampton, Easton & Washington Traction Co., Easton, Pa.....	16.8	1,250,000	200,000	$15,000	Sold at receivers sale and reorganized as New Jersey Interurban Co. in 1923. Receiver discharged in 1924.
Buffalo & Lake Erie Traction Co., Erie, Pa.....	168 0	7,500,000	7,066,000	760,000	Sold at foreclosure sale and reorganized as the Erie Railways Co. and the Buffalo & Erie Railway Co.
Ephrata & Lebanon Street Ry., Lebanon, Pa.....	23.0	220,000	203,000	None	Sold at foreclosure sale and reorganized as Lancaster, Ephrata & Lebanon Street Ry. Co.
Pittsburgh Railways Co., Pittsburgh, Pa.....	599.75	48,263,050	45,836,190	None	Receiver discharged.
Total of receiverships terminated (18 companies)	1,607.99	$72,974,745	$97,449,825	$3,382,388	
Foreclosures but Receivers Not Yet Discharged					
Connecticut Valley Street Ry., Greenfield, Mass.	47.05	$620,000	$580,000	$10,000	Sold at foreclosure sale and property liquidated Receiver not yet discharged.
Northern Massachusetts St. Ry., Greenfield, Mass.	44.09	500,000	500,000	40,000	
Ohio River Elec. Ry. & Power Co., Pomeroy, Ohio.	12.70	300,000	315,000	None	Sold at foreclosure sale and abandoned.
Cleveland, Alliance & Mahoning Valley R. R., Ravenna, Ohio.....	46 0	1,100,000	1,100,000	8,000	Sold at foreclosure sale. To be reorganized, but receiver not discharged.
Total of foreclosure sales without receivers' discharge (4 companies).....	149.84	$2,520,000	$2,495,000	$58,000	
Foreclosures Without Receiverships in 1924—None					

terminated in 1923 that were retained in the tables published in last year's Statistical Number. Among them were the Nassau Electric Railroad, Brooklyn, N. Y., with 136.1 miles of track and outstanding securities including $105,925 of stocks, $13,571,928 of bonds, and $70,000 of receiver's certificates; and the Orange County Traction Company, Newburgh, N. Y., with 20.82 miles of track and securities of $325,000 of stocks and $780,000 of bonds. The former road was returned to its owners, the Brooklyn-Manhattan Transit Corporation, in 1923. The other property was sold under foreclosure proceedings in 1923 and was reorganized as the Newburgh City & Suburban Railway. In last year's table the Denver & Intermountain Railroad, Denver, Col., was included in the list of roads in receivership. This road, although a subsidiary of the Denver Tramway, which has been in receivership since 1920, was never itself in receivership, as information received this year states.

The Aurora, Elgin & Chicago Railroad of Aurora, Ill., has not been included in the list of railways in receivership this year. This property was sold during 1922, a portion of it being reorganized as the Aurora, Elgin & Fox River Electric Company, while the third rail interurban was reorganized as the Chicago, Aurora & Elgin Railroad. Both of these are solvent, but due to claims remaining against the original company, the receiver of the Aurora, Elgin & Chicago has never been discharged. Since this latter company does not control any of the property it has been removed from the table.

TABLE VI—ENTIRE PROPERTIES ABANDONED IN 1924

	Miles of Single Track	Stock	Bonds
Gadsden, Bellevue & Lookout Mountain Ry., Gadsden, Ala.	3.1	.....	.....
Shore Line Electric Ry., Norwich, Conn.	28.22	$1,000,000	$2,725,000
Brunswick & Interurban Ry., Brunswick, Ga.	6.25	.....	.....
Caldwell Traction Co., Caldwell, Idaho	11.0	.....	.....
DeKalb-Sycamore & Interurban Traction Co., DeKalb, Ill.	6.5	.....	.....
Milford, Attleboro & Woonsocket Street Ry., Springfield, Mass.	29.73	315,000	300,000
Kansas City Power & Light Co., Carrollton, Mo.	2.0	.....	.....
Glen Cove Railroad, Far Rockaway, N. Y.	3.0	50,000	None
Great South Bay Ferry Co., Freeport, N. Y.	2.92	.....	.....
Wallkill Transit Co., Middletown, N. Y.	12.84	.....	.....
Suffolk Traction Co., Patchogue, N. Y.	11.61	.....	.....
Port Jervis Traction Co., Port Jervis, N. Y.	4.78	30,000	70,000
Goldsboro Electric Railway Co., Goldsboro, N. C.	3.5	.....	.....
Ashtabula & Lake Shore Ry., Ashtabula, Ohio	0.4	.....	.....
Pennsylvania & Ohio Traction Co., Ashtabula, O.	24 0	.....	.....
Norwalk & Shelby R.R., Norwalk, Ohio	24.0	125,000	150.000
Ohio River Electric Railway & Power Co., Pomeroy, Ohio	12.70	300,000	315,000
Pacific Power & Light Co., Portland, Ore.	5.6	.....	.....
Berwick & Nescopeck Railway, Berwick, Pa.	1.66	.....	.....
Corry & Columbus Traction Co., Corry, Pa.	4 0	.....	.....
Titusville Traction Co., Titusville, Pa.	16.71	.....	.....
Montoursville Passenger Ry., Williamsport, Pa.	5.5	.....	.....
Cheyenne Electric Ry., Cheyenne, Wyo.	5.5	.....	.....
Total for 1924 (23 companies)	225.52	1,820,000	3,560,000

The Northern Massachusetts Street Railway and the Connecticut Valley Street Railway of Greenfield, Mass., were abandoned in 1923 and sold for junk. Subsequently portions of these properties were taken over by the municipalities of Athol, Orange, Greenfield and Montague and two municipally operated companies known as the Greenfield & Montague Street Railway and the Athol & Orange Transportation Areas were formed under the laws of Massachusetts.

The Alamance Railway Company, Burlington, N. C., was not included in the list of receiverships in 1923, as it was thrown into receivership on Dec. 15, and information was not available until after the forms were closed for last year's Statistical Number. This company, which had 8.4 miles of track, was capitalized at $60,000 of stocks and $120 in bonds.

Preventing Election Day Accidents

MUNICIPAL election days in New Bedford, Mass., have been the occasion in recent years of numerous collisions between autos and street cars. These collisions for the most part have been due to the increased use of automobiles to transport voters to the polls, and the desire on the part of the drivers to make as many and as speedy trips as possible. Realizing that it would be difficult to get the automobile drivers to be more careful, the management of the Union Street Railway undertook to warn its motormen to be particularly careful on that day. On election morning two large posters were placed in conspicuous places in the carhouse, where all trainmen could see them. These signs read: "Watch the cross streets—Today is election day and autos are sailing through the streets. Let's have one election day without an accident." A sticker reading "Watch the cross streets" was pasted on the inside front vestibule window of each car, and served as a reminder to the motorman throughout the day. As a result of this simple campaign the number of accidents was reduced from eight, the average for previous years, to two, both of which were of minor importance.

Less Accidents Without Fenders in Baltimore*

ALL projecting fenders were removed from street cars of the United Railways & Electric Company of Baltimore, Md., with the approval of the Public Service Commission. Formerly fenders of the projecting type were carried on all cars, and H-B lifeguards were also installed as additional protection. A careful record has been kept, and since the removal of the projecting fenders it is the company's experience that many accidents have been avoided that formerly were caused by these fenders projecting beyond the ends of the cars, particularly at curbs and locations along the track where there are narrow curves.

The reduction in accidents since the fenders were removed May 9, 1920, is indicated in the accompanying table. While there have been minor fluctuations in the number of accidents to pedestrians from year to year, there has been a reduction of approximately one-half ever since the fenders were removed.

REDUCTION OF ACCIDENTS TO PEDESTRIANS IN WHICH FRONT END OF STREET CAR WAS CONCERNED, BALTIMORE, MD.

	With Fenders	After Removing Fenders			
Years beginning May 10	1919	1920	1921	1922	1923
Picked up by fender	179	....	....	....	....
Picked up by wheelguard	....	49	31	39	33
Rolled off of fender	2	....	....	....	....
Went under car, not picked up by wheelguard	18	13	12	21	26
Struck and brushed aside	191	141	113	120	123
Struck but not knocked down	41	14	22	12	24
Total	431	217	178	192	206
Decrease, per cent	....	50	59	55	52

It is stated that it is impossible to estimate the amount of saving due to the elimination of fenders, as the awards or verdicts in accident cases vary, but the annual saving in maintenance is estimated at $13,500.

*This article is based on material included in the brief submitted to the Charles A. Coffin Prize Committee of the American Electric Railway Association by the company named.

The News of the Industry

Referendum Ready

Chicago Voters Will Answer Questions on Purchase of Railway Properties and Municipal Ownership

While stinging charges flew in Chicago over the traction situation created by the municipal ownership campaign, city lawyers have proceeded to work out the legal features of a referendum on the purchase and operation of transportation lines. The ballot or ballots will be presented to the voters on Feb. 24. One of the propositions is so phrased that the vote will give a direct answer to the controversial question between utility operators and public men of whether or not public ownership is discountenanced in the eyes of the people of the city.

Two Propositions Submitted

"Shall the city issue $000,000,000 in special bonds (Schwartz certificates) for the purpose of purchasing the ——— Lines?" will be the first question. In the blank it is likely that only the name of the Chicago Surface Lines will be inserted. Inasmuch as differences of opinion exist between Mayor Dever and Samuel Insull, head of the elevated lines, it is likely that the Mayor will have to drop that much of his program and admit defeat for his consolidation schemes, for no progress has been made toward getting a figure on the price of the elevated. On the other hand, engineers are fast rounding up the work of the evaluation of the Chicago Surface Lines.

The second proposition will be brief. It will simply ask the voter whether he approves of municipal operation. To carry, it must have a majority of the highest number of voters voting at the election, and if it fails the first proposition will be nullified regardless of what majority it might have. It is necessary from a legal standpoint to submit the proposals despite the fact that the city would not have actual control of the operation of the property for years.

Henry A. Blair, head of the Surface Lines, although not ostensibly campaigning, has taken several stinging shots at municipal ownership recently. Mr. Blair, seeking to help the transportation situation, had offered a plan for consolidation of elevated and surface lines, taking the city in as a partner and eventually giving it the consolidated plant by credits taken from earnings.

Mayor's Attitude Criticised

Mayor Dever is bitterly assailed by the Northwest Side Commercial Association over his recent debate with Samuel Insull. In a pamphlet issued Jan. 1, and which is entitled "The Truth About the 'L' Roads," the club's secretary says Mayor Dever signed his subway-municipal ownership message to Council in October without comprehending its meaning and that he has no facts to support his contention that Insull cannot raise $25,000,000 to finance the new elevated lines for which he is seeking franchises in the city. The author of the pamphlet, T. F. Deuther, previously had been a sharp critic of transportation lines, which he asaailed as controlled by "the traction barons."

One-Man Car Case Argued

Officers of Prominent Roads in East Testify Before the Members of the Public Service Commission Sitting in Buffalo Regarding Their Experiences with One-Man Cars

REPRESENTATIVES of electric railway systems throughout the East have rallied to the support of the International Railway in its efforts to continue the operation of one-man cars on the local lines of the system in Buffalo. During the week ended Jan. 3 the Public Service Commission held a hearing in Buffalo on the application of the City Council of Buffalo to have the state utilities board abolish one-man cars in the city. The evidence was heard by Commissioners William R. Pooley, Oliver C. Semple, George R. Van Namee and Charles Van Voorhis of Rochester.

Statistics Show High Death Rate

Evidence was presented by a score of witnesses for the city, tending to show the increased number of accidents due to one-man car operation on many of the heaviest patronized lines of the city. Included in the evidence was a report issued by the United States Department of Commerce which showed Buffalo's death rate from street car accidents was the highest in the country in 1923. The list included 66 cities of 100,000 population or more and the death rate for Buffalo due to street car fatalities was 6.9 per 100,000 of population.

Among the witnesses for the International Railway were Herbert G. Tulley, president; Harry B. Weatherwax, vice-president of the United Traction Company, which operates one-man cars in Albany, Troy, Cohoes, Watervliet and other cities; Edward Dana, general manager of the Boston Elevated Railway; Clinton E. Morgan of Brooklyn, vice-president of the Brooklyn City Railroad; Edwin M. Walker, president of the Schenectady Railway, and others. Coleman Joyce, general counsel for the Mitten interests of Philadelphia and Henry W. Killeen, Buffalo, counsel for the International, appeared for the company.

President Tulley told the commission there is no reason why one-man car operation should be abolished in Buffalo. He testified that if he felt one-man cars are accident breeders, the management would discontinue them for humanitarian and economic reasons. Experience, however, he said, has shown they are safer than two-man cars. He submitted figures dealing at length with the records of accidents in Buffalo to prove his point.

Mr. Weatherwax expressed the opinion that as far as safety, adequacy of service and economy are concerned there is no other vehicle that compares with the one-man car. He said they are the only salvation of some traction companies. Taking similar periods of operation in 1920 on his lines when two-man cars were in use and in 1924 when one-man cars were operated, Mr. Weatherwax testified that accidents were reduced from 2,241 to 1,675. He said there were fewer loading and alighting accidents, but that collisions had increased from 1,054 to 1,237. He attributed this increase to the larger number of automobiles in operation today. He also testified that collisions had increased under one-man car operation, although 1,000,000 fewer car-miles were operated.

Evidence to Prove One-Man Car Operation Safe

Edward Dana, general manager of the Boston Elevated, produced records to prove that one-man car operation is safer than the two-man system in Boston. One-third of the surface lines in Boston are operated with one-man cars, he said. In 1923 there were 10,000 accidents, of which there were 230 per 1,000,000 car-miles of one-man operation and 261 per 1,000,000 miles of two-man operation in Boston. So far in 1924 Mr. Dana said there have been 8,757 accidents, or 151 per 1,000,000 car-miles of one-man operation and 278 per 1,000,000 miles of two-man operation. Mr. Dana also testified that the saving by the use of one-man cars in Boston has been about $1,000,000 annually.

Mr. Morgan of the Brooklyn City Railroad said that in the city of Brooklyn 24 per cent of all the cars on the surface lines are operated with one-man cars and that the company contemplates operating more one-man cars.

Mr. Walker went over the ground of his experience with one-man cars, particularly their use in Terre Haute, a complete one-man installation put in under his own direction.

As was explained briefly in the ELECTRIC RAILWAY JOURNAL for Dec. 13,

the City Council of Buffalo recently enacted two measures in its movement to prohibit the operation of one-man cars on all local lines of the International Railway. This it did despite the opinion of the city law department that the ordinances are unlawful. Within 24 hours after the ordinances were enacted motorcycle police arrested eight operators of one-man cars on a charge of speeding.

The car operators who were arrested, through counsel for the railway, entered pleas of not guilty. The basis of the action by the city against the operators who were arrested is that they were running their cars in excess of 6 m.p.h., the speed which was fixed as the limit in one of the recently enacted measures.

One-Man Cars in Worcester Not a Menace

There is no reason for curtailment of the use of one-man cars by the Worcester Consolidated Street Railway, Worcester, Mass. This is the finding made by the inspectors of the State Department of Public Utilities, who recently completed an investigation of the use of one-man cars in that city. The inspectors found that only one of the eight specific complaints against cars was justified—the complaint regarding an insufficient number of electric switches. The department dismissed the petition of the Worcester city authorities asking that one-man cars be banned.

The inspectors recommended:

Stricter supervision of the operating department of the Worcester Consolidated.
Installation of car starters in the congested districts to make change and announce the routes of approaching cars.
Installation of additional electric switches.
Improved car inspection service, especially as to destination signs.
Stricter enforcement of the rule requiring conductors to announce the streets.
An arrangement for distribution of mail and papers from cars that would do away with the need for the motorman to leave the car platform.
Extended use of hand brake.
Use of change carriers by operators of one-man cars.
Extra cars from Grove Street making initial trip from city hall to use Summer Street from city hall.
Better co-operation of patrons.

The report of the inspectors has apparently satisfied Worcester for the findings have been generally accepted as satisfactory by those agencies and groups which initiated the complaint against the use of one-man cars as a menace to the safety of patrons and a factor in the complicating of Worcester's traffic problems.

The railway officials have declared they will put all the recommendations into force as rapidly as it is physically possible to do so.

The fight against one-man cars in Worcester was brought to a head by an accident in which a woman and child were killed. The City Council took up the question, with the result that a petition was filed with the Public Utilities Department voicing official opposition to one-man cars. The department immediately assigned inspectors to make an investigation. The work took several weeks. The findings made by the inspectors have been accepted by the city government without question.

Railway Officers Testify at New York Inquiry

William S. Menden, president of the Brooklyn-Manhattan Transit Corporation, and Frank Hedley, president of the Interborough Rapid Transit Company, were the witnesses on Dec. 29 and 30 in the investigation being conducted before Judge McAvoy at the instance of Governor Smith.

The testimony of both was very much along the same lines. They told in detail the reasons for the inability of the companies to give better service. Mr. Menden said that expenditure by the city of $30,000,000 to build the Nassau Street subway, complete the Fourteenth Street-Eastern line, provide adequate shop facilities and lengthen station platforms to take eight-car trains would double the capacity of the B.-M.T. system. Mr. Menden declared that expenditure of this sum, approximately one-fifth of what the city now has invested in the B.-M.T. subway system, would increase its capacity from 600,000,000 passengers a year to 1,200,000,000. All but the lengthening of the station platforms are contract obligations of the city, he said.

Other features of Mr. Menden's testimony included a declaration that lack of shop facilities had prevented the company from increasing its non-rush hour service and the assertion that lack of these same facilities had made it impracticable to buy new steel cars to substitute immediately for those now in use in the Center Street loop. Mr. Menden said that personally he did not think the use of the wooden cars constituted any appreciable hazard but that the company intended to displace them as soon as possible because of the public sentiment against them.

Mr. Hedley declared that the company's rolling stock was now being crowded to the maximum, consistent with safety, in an attempt to comply with the Transit Commission's order of two years ago, directing the company to run 360 additional trains. Because of the alleged failure of the city to supply adequate shop and yard facilities, Mr. Hedley testified, the company had had great difficulty in meeting the terms of the order and only during this year had been able to give practically complete compliance.

Mr. Hedley said that the inspection facilities had been improved during the last few years and that the shop facilities would be sufficient in a short time when the second and third additions of the Lenox Avenue shops, now practically completed but not formally turned over to the company, were put into use.

Asked why non-rush hour express service north of Times Square had not been increased, Mr. Hedley said:

Because we are crowding that rolling stock in the subway to the maximum, we are crowding it even beyond what it should be crowded in making a daily average car mileage, and if you increase that daily average car mileage in the middle of the day you will have cars that will have to be withdrawn from service that will not be ready for service during the rush hours, and it is my opinion that if we should increase today the mileage in the middle of the day we would not be able to do as well as we are now doing with the mileage during the peak load, morning and night. When you get the cars beyond a certain mileage every day, with the very limited facilities, practically void of new shop facilities, your breakdowns to car equipment increase very rapidly with the increase in mileage. The average records that we have on that show that 1 per cent increase in mileage will add about 4 per cent to the increase in car failures, because the equipment is now overloaded, and the more you overload it the more you multiply your troubles.

J. S. Doyle, assistant to the general manager, testified that a great increase in number of "car failures" and in the number of cars requiring repairs resulted from the intensive use of the company's rolling stock in an effort to comply with the Transit Commission's increased service order. He said that the number of cars requiring repair increased from 23 to 33 a day. Later he said car failures became fewer, as the company obtained more inspection facilities and improvised shop facilities. He added that although the car "breakdowns" had been reduced, the delays on the line had not been reduced and said that in his opinion this was due to the overcrowded condition of operation of the subways.

Bus Regulatory Ordinance for St. Louis Protested

It would be a breach of good faith on the part of the city of St. Louis should it enact the proposed city ordinance for the rigid control of buses prepared by C. E. Smith, consulting engineer for the city, for it would put the People's Motorbus Company, now operating over 54 miles of city streets, out of business. Robert W. Burkham, counsel for the motor bus company, so informed members of the Aldermanic committee on public utilities at a public hearing on Nov. 26. Mr. Burkham also charged that the further purpose of the bill was to make it forever impossible for any other independently owned motor bus company to operate in the city. Mr. Burkham said that the terms of the ordinance were so unfair as to the regulations, operating conditions and taxation imposed that it would be impossible for the People's Motorbus Company to accept it, and he then pointed out that the ordinance provided that the grant must be accepted immediately by the present company in full should it seek to retain the permits for bus lines it now holds.

Col. Albert T. Perkins, general manager for Receiver Rolla Wells of the United Railways, stated that the first information any of the United Railways officials had of the bill's existence was when they read in the newspapers that it had been presented to the Aldermen. He informed members of the committee that he was just as firm a believer in buses as either Mr. Burkham or Mr. Meade and three years ago had endeavored without success to obtain permission from the federal court to install bus lines. However, he stated that the buses should co-ordinate with the street cars.

Mr. Smith, the author of the bill, told the committee that he advocated the measure to protect the public against possible watered stock, if not during the present management, perhaps in the future.

The committee has taken the bill under advisement.

Kansas Interurbans React Differently to Bus

Interurban electric lines radiating from Kansas City do not all react alike to the increasing interurban bus development. The Kansas City, Kaw Valley & Western, reaching Lawrence, Kan., has felt little effect from the bus in the towns between terminals. Lawrence, however, has turned to the bus to an appreciable extent. The towns between afford good support in both freight and passengers. Hourly service is maintained from 6:30 a.m. to 11:30 p.m. by eight trains. The competition began in October, 1923, with the completion of the hard-surfacing of the state highway. Experimental riding of buses has resulted in some return to the greater comfort of the trolleys, breaks in good weather showing prompt favoring of the rail line. This company has no present thought of joining a bus service to its rail system, holding that two sets of overhead costs would not be justified. The Lawrence round trip is $1.75 by trolley, single fare $1.08. The through-to-Topeka bus fare for Lawrence is $2.50 round trip, one way $1.25.

By way of contrast the Kansas City, Clay County & St. Joseph line is strenuously seeking to link the two types of service so as to permit a reduction of its train service. In fact, a request for permission to reduce is before the Missouri Public Service Commission. This company's Blue Bus Line is competing for the heavy bus patronage that has developed to Excelsior Springs, Missouri's internationally famous health resort.

The Kansas City, Leavenworth & Western Railway has just been awarded a bus line franchise for the city of Leavenworth and may discard its railway system there. It is not intended to run buses between the cities. The freight business of this line is excellent.

The "Hocker" electric line, the Kansas City, Lawrence & Topeka, which never has built farther than Merriam, Kan., so far has been free of bus competition and is not considering the use of buses.

Detroit Company Advertises at Radio Show

Various dealers in radio apparatus held a radio show in Detroit during November. While this show was primarily for the purpose of acquainting radio "fans" with the developments in the radio art, the Department of Street Railways considered it a good opportunity to acquaint the public with the fact that radio apparatus was being used very successfully by the Department of Street Railways.

The executives of the radio show objected at first to the D.S.R. advertising at this show, but when they had been shown that the railway had advertised the radio show at its own expense and had put posters in all the cars, the executive committee withdrew its objections and the D.S.R. displayed a poster which outlined briefly its radio activities.

The poster was 3 ft. x 4 ft. in size. It consisted of photographs of the various equipment used in making a radio call, the photographs being so arranged as to show the ordinary sequence of the call from the time the trouble was reported until the crew was actually repairing the damage. The lower half of the poster consisted of a photostat copy of the article which appeared in the ELECTRIC RAILWAY JOURNAL, issue of July 12, 1924, relating to the use to which the street railway department of Detroit puts radio in connection with its line and trouble crews.

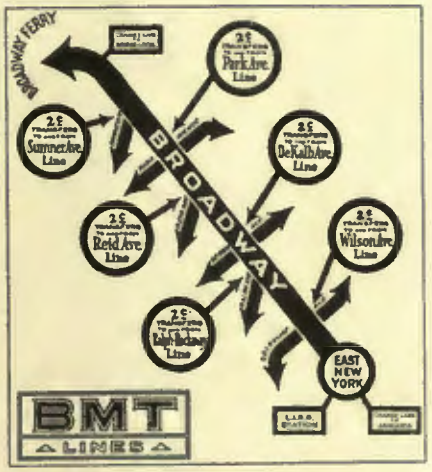
Traffic Ordinances in Effect

Two city ordinances regulating traffic in the congested district of St. Louis, Mo., have gone into effect. They provide police court fines of $5 to $500 for violation.

One ordinance prohibits, among other things, the parking of non-commercial vehicles on certain streets between 7 and 10 a.m. and 4 and 6 p.m. The other ordinance grants the Traffic Council authority to create zones and designate streets on which there shall be no parking and permits the Council to make rules deemed necessary to expedite enforcement of the ordinances.

Transfer Service Advertised in Interest of Merchants in Brooklyn

Officials of the Brooklyn-Manhattan Transit Corporation are co-operating with the Broadway Merchants' Association by advertising its 2-cent transfer points along Broadway by means of placards in the cars and supplying duplicate copies to be distributed by the merchants among customers. This is regarded as a distinctly progressive step in promoting Broadway as a leading shopping street and the merchants are said to be finding a greater response from outlying sections the residents of which were unaware of the transfer privileges.



Transfer Points Called to Attention of Brooklyn Riders

The B.-M. T. has printed the placards with the emblem of the Broadway Merchants' Association and its motto of "Reliability." This in turn has made the merchants realize that the organization has some influence and that its aim to provide the best of service to shoppers patronizing Broadway and vicinity has been found worthy of the support of the railway.

Subway Agreement Presented in Philadelphia

Mayor Kendrick of Philadelphia, Pa., recently received the draft of an agreement between the city and the Philadelphia Rapid Transit Company for the proposed Chestnut Street subway. The document was prepared by a committee consisting of four city and three P. R. T. officials. The plan provides that the Chestnut Street subway be built at the cost of the city, with money derived from the sale of bonds. It would be leased to the P. R. T. and for 50 years the P. R. T. would both maintain the subway and pay a rental. The rental paid during those 50 years would be sufficient to meet all interest on the bonds issued by the city to pay for the subway and all state taxes, and also to provide a sinking fund which would retire the bonds. When the 50-year period ends the P. R. T. would continue to have the right to run cars in the Chestnut Street subway without any further payment of rentals. The agreement provides further that nothing in the terms of the contract would alter the agreement of 1907 under which the city has power, on July 1, 1957, or July 1 of any subsequent year, to acquire the rights and properties of the P. R. T. if it so desires. The agreement will be put before the Transit Commission, recently created by the Council. At the meeting of the Transit Commission at which the company presented its proposals regarding the subway the company asked that the line be designed by its own engineers. No mention of this suggestion was made in the draft of the proposed agreement.

An Army of Riders "16 Years Long"

The second of a series of accident prevention meetings which will last through the winter has been started by Victor T. Noonan, supervisor of accident prevention of the Chicago Surface lines. Mr. Noonan's first address in the series was "The Value of Human Life." In his remarks Mr. Noonan announced that in the first 10 months of 1924, supposedly as the result of the last year's safety work, there were 27 fewer fatalities on the lines than in 1923. The number of employees killed in the 1924 period was five as against 14 in 1923.

Indifference to perils, Mr. Noonan says, is a greater destroyer of life than typhoid fever, dynamite and fire combined. "I say, slow up your living. Don't live so fast. No nation in the world is so careless of its humanity as America."

The Chicago Surface Lines publishes the following figures:

The street railways of the United States in 1923 carried 16,000,000,000 passengers.

Mobilized four to the column, this army would extend 6,060,606 miles.

This army would encircle the globe 242 times at the equator.

Marching at 3 m.p.h., it would take 173 years or until the year 2097 A. D. to pass in review.

The Chicago Surface Lines in 1923 carried 1,461,277,888 passengers.

Mobilized four to the column (8-ft. spacing), this army would extend 553,514 miles.

This army would encircle the globe 22 times at the equator.

Marching at 4 m.p.h., it would take this army about 16 years or until 1940 to pass in review.

St. Louis Hard Hit by Storm

Street car traffic in St. Louis, Mo., suffered severely in the storm on Dec. 18 and 19. Many lines were put completely out of business and cars on others were forced to operate behind schedule. On Dec. 18 toward evening at the very beginning of the peak-load period the temperature fell quickly and in a few hours the wires and tracks were covered with sleet. Poles of telegraph and telephone companies snapped and dragged their wires down over the tracks in some sections, while many large trees also fell. A strong wind added to the damage.

H. O. Butler, traffic manager of the United Railways, at 9 p.m. issued a bulletin that all traffic between Wellston and St. Charles, Mo., would be suspended. Some cars on this division were marooned. The Kirkwood-Ferguson division also suffered greatly. The Illinois Traction System, which operates out of St. Louis via the McKinley Bridge, was hard hit, as were the East St. Louis & Suburban Railway's city lines in East St. Louis and Alton, and the St. Louis, Columbia & Waterloo Railway.

For a time the only county division of the United Railways able to operate was a section of the Kirkwood-Ferguson line between Wellston and Brentwood. In all 60 cars were stranded on the county lines.

Superintendent Butler of the United Railways pronounced the storm the worst in 36 years. While the company succeeded in keeping most of the city lines in service between terminals there was considerable congestion.

The first sleeper out of St. Louis over the Illinois Traction System after the storm for points east and north did not leave until the night of Dec. 22. This company, however, succeeded in maintaining service on its lines from Champaign to Danville and on several branch lines out of Danville. In Springfield, Ill., tractors were used to rescue some of the stranded cars.

At Decatur, Ill., buses operated by the Illinois Power & Light Corporation worked without interruption during the storm and saved the city from complete transportation paralysis. Chauffeurs changed the usual route slightly when obstructions were encountered, but service was fairly reliable despite unprecedented difficulties. Buses are now run to every section of the city, but it was never anticipated that practically the entire load from the railway would be thrown upon them.

Steam railroads were also hard hit by the storm and crack trains were from 16 to 48 hours behind schedule into St. Louis. Few long distance telephone lines remained in service.

Mayor Suggests Conference with Portland Officials

In a letter to the City Council recently, Mayor Baker of Portland, Ore., recommended that that body confer with the Portland Electric Power Company on the matter of car extensions to districts now declared to be inadequately served. The Mayor also suggested one-way traffic for street cars and rerouting where cars now interfere with the one-way traffic plan.

One of the problems to be worked out in connection with the extension of service to new districts, the Mayor suggested, was whether the extensions should be made by car line or by bus lines. He pointed out that because of the large investment of the Portland Electric Power Company it should have the first opportunity to make the extensions. If the extensions were made by operation of bus lines, Mayor Baker declared that transfers should be issued between the buses and the street cars.

He suggested a plan be worked out by which these districts might be served without duplication of that service given by the company, and argued that any duplication would be unsound.

The Portland Electric Power Company has already indicated its willingness to use the bus in one or two other instances.

Subway Fund Only for Subways

Only expenditures specifically attached to construction of the downtown subway in Pittsburgh can be made from the $6,000,000 bond fund authorized by the people's vote. This is the substance of a ruling made by Judges James R. Macfarlane and Joseph M. Swearingen, hearing the action to restrain the city from maintaining the bureau of traffic relief from the fund. The court said:

> This ordinance is rather broad. The measure provides for the creation of the bureau of traffic relief for the purpose of making a study and investigation into the feasibility, advisability, location, and cost of traffic relief by means of a subway, or otherwise, in the First and Second wards of the city of Pittsburgh and to estimate the cost thereof, and in connection therewith to study and investigate the vehicular traffic in the downtown business districts of the city and report from time to time and recommend measures of relief both of an experimental and permanent nature.
>
> This thing might go on indefinitely and still there would be no subway.

The court made it plain that the city could use money from the bond issue which would be a legitimate expense in connection with the building of the subway, but no portion of it could be used for making an investigation into traffic problems.

Experiment with Fewer Stops in Boston

The Boston Elevated Railway recently decided to try the skip-stop plan in Beacon street for 60 days. Edward Dana, general manager, said:

> The number of stopping places per mile determines to a large extent the character of the service rendered. Service is slowed down and rapid transit prevented by observing a large number of stopping places. The cost of service also is affected by the number of stopping places. If a minimum number is provided, power consumption is reduced, other economies follow and better service may be rendered. The greatest economy as well as efficiency of service can be obtained with between four and five stops to the mile.
>
> Applying this principle to this particular line, it is estimated that a saving of $20,000 a year can be made in the cost of service. Beginning Dec. 1 the board of trustees has decided to make a trial for 60 days of the effect of reducing stopping places to the above standard between Cleveland Circle and Kenmore Street on the Beacon Street line. During this trial it will be possible to determine whether or not the service is improved and whether it is in the interest of the greatest number to continue this arrangement and extend it to other routes of the Elevated Railway.

West Penn Railway to Seek Co-operation of Civic Bodies

A movement to attract new industries to the territory covered by the West Penn System in western Pennsylvania, Ohio, West Virginia and Maryland has been started by the West Penn System in the inauguration of an industrial extension department.

The primary object of the movement is to attract additional manufacturing plants, but a specialized effort will be made to secure those of a diversified nature. It is hoped that the plan will eliminate to a certain extent the possibilities of a partial or complete shutdown of all industries at one time.

The close proximity of raw materials, economy of fuel and power, abundance of labor, unexcelled transportation facilities by rail and water and the nearness to markets are expected to prove unusually attractive to manufacturers now located in sections of the country that do not offer these combined advantages.

E. B. Glazier, industrial extension engineer of the West Penn System, will supervise the work. He will confer with the boards of trades, chambers of commerce, other civic bodies and the local industries in the various cities and towns in an effort to have them co-operate with him and furnish statistics and information regarding the particular advantages they can offer to concerns seeking new locations for plants.

Combined Ticket and Selling Agents in Brooklyn Make Good

Two ticket agents of the Brooklyn-Manhattan Transit Corporation, Miss Kathryne Rocha and Miss Mary Begot, who have been on duty for some time past at the Newkirk Avenue station of the Brighton Beach line, are conducting a merchandising experiment in which they combine the duties of ticket agents for the B.-M. T. and sales agents for the Broadway Subway Advertising Company, which has the contract for advertising and vending on the B.-M. T. lines. The experiment is being made as the result of the installation of additional entrance and exit facilities for passengers at this station. Four automatic turnstiles have been installed in place of the two operated by agents.

The ticket agents now are on duty at the news-stand and make change there for passengers who are not supplied with the nickel needed to operate the automatic turnstiles. The agents have so arranged their hours that two of them are on duty from 6 a.m. to 10 a.m. on weekdays, and thus passengers will not have to wait for change during the period of maximum traffic. The two agents have an assistant who relieves them during the early morning hours, so that they provide 24-hour service in their dual capacity of ticket agents and sales agents. The experiment has been in effect since Nov. 29. It is understood to have worked out satisfactorily for the public, the agents and the companies. The agents receive a commission on the sales of papers, periodicals, cigars, cigarettes and candies, so that as they increase the sales their compensation increases.

Loan Association at St. Louis Unusually Successful

More than 25 per cent of the employees of the United Railways, St. Louis, Mo., have been enabled to purchase their own homes through the operations of the United Railways Savings and Loan Association.

Since the association was formed in 1915 by officials of the company 1,550 members have built or purchased their homes with the assistance of the association. More than 4,000 workers have bought stock, paying for most of it on the monthly payment plan.

The success of the plan of helping the workers to help themselves is believed to have been responsible for reducing the labor turnover to a point where it is no longer a problem to the management. Among the 4,000 carmen now serving the company it is said that not one was hired or fired during a recent period of four months.

Robert Richardson, president of the association, is quoted as follows:

> The satisfied employee is the one who is saving money, and the United Railways encourages every man and woman in its employ to become a saver. I find that more than one-half of our workers today own their homes, a record which far outdistances any other body of industrial workers in St. Louis.

The United Railways Savings and Loan Association, organized under the building and loan laws of Missouri, operates along the lines of a savings bank. No penalty is assessed for failure to pay dues promptly. Interest starts from the time the money is deposited and an employee needing his funds for an emergency may obtain them at any time without loss. For instance, of the worker agrees to purchase $4,000 of stock of the association at the rate of $20 a month an insurance feature provides that if he dies the beneficiary shall get the $4,000 stock paid in full.

The Employees' Mutual Benefit Association also furnishes the workers for the street railway company free medical attention for themselves and members of their families. The dues in this organization are only $3 a year.

In 1923 more than 50,000 cases of sickness were handled by the association. Hospital fees are also provided, while the family is cared for if the breadwinner is not able to work.

Riders Receive Transit Story at First Hand

Passengers on the Brighton Beach, Sea Beach, West End, Fourth Avenue and Culver lines of the Brooklyn-Manhattan Transit Corporation have received copies of a booklet entitled "Rush-Hour Relief for Passengers on Brighton Beach and Other South Brooklyn Lines." This distribution was made on Nov. 28. A similar booklet will be distributed on the Eastern District lines. The facts of the transit situation which apply particularly to this section of Brooklyn are set forth in the booklet. These facts are supplemented by a copy of the letter written by Gerhard M. Dahl, chairman of the B.-M. T., on Nov. 10 to Mayor Hylan, in which Mr. Dahl used the Mayor's statement in defense of the 1925 city budget to refute the Mayor's assertion that the transit companies in New York City can and do make plenty of money on a 5-cent fare. The distribution of this booklet to passengers is part of the B.-M.T. program of presenting the facts of the transit problem to the public.

Negotiations Over Buses Still Under Way in Kansas City

Negotiations are still in progress between the receivers of the Kansas City Railways and the city concerning regulations affecting bus transportation. The federal court is awaiting the outcome of these proceedings before issuing a final order regarding the installation of bus service by the railway. Tentative suggestions from the city officials indicate that a 3-year franchise for bus operation may be offered to the railway. A 5-year franchise was the minimum suggested by representatives of the railway.

Meanwhile a special commission on bus service, appointed by the Mayor several months ago, has made a preliminary report. The commission recommends that any bus line operating should have a permit that designates routes and stops; that interurban buses shall not enter the congested district, and that parking should be prohibited on downtown streets over which buses operate, to give them a clear way.

Binghamton Railway Tells Binghamton

In connection with the twentieth anniversary of the Binghamton *Press*, the Binghamton Railway, Binghamton, N. Y., recently ran a full page ad in the paper emphasizing the fact that a community grows no faster than its public utilities. Along with some facts about its passenger-carrying capacity and its average speed, the ad contains pictures showing the company's progress in equipment since 1886. In contrast to the 1886 model, the picture shows the railway's 1924 steel car seating forty-two passengers, the standard car adopted for present-day service.

Public Official Wants Mental Test for Every St. Louis Autoist

Major Clinton H. Fisk, director of streets and sewers, St. Louis, Mo., at a recent meeting of the St. Louis Traffic Council urged that an ordinance be passed to force every motor vehicle driver of the city to submit to a mental test in order to obtain a license to drive. At a round-table discussion of traffic problems in which officials of the United Railways, the People's Motorbus Company, taxicab and truck operators and police department officials participated, Major Fisk was assured that each of the interests represented would support a bill of this character.

Major Fisk pointed out in his talk that at present taxicab and motorbus drivers are compelled to submit to a mental test to obtain licenses, and expressed the belief that there is no valid excuse why all drivers should not be compelled to do so. He stated that a bill of that nature will be submitted to the Board of Aldermen when that body reconvenes in October.

A report read at the meeting showed that there has been an increase of 22 per cent in the number of motor vehicle accidents during the past few months despite a decrease in all other accidents.

Col. Roy Britton, president of the Automobile Club of Missouri, an organization with more than 21,000 members in St. Louis alone, is opposed to Major Fisk's plans.

Salesmen Must Not "Pass Up" Patrons

Trainmen of the Pittsburgh Railways, Pittsburgh, Pa., have been warned against the common fault of motormen in sometimes neglecting to stop for waiting patrons. The company feels it is not part of the sales philosophy to neglect a possible patron and it has brought to the consideration of all employees the duty of selling rides. The company says:

> Stop and consider the fact, and it is a fact, that you are salesmen. You are engaged in selling a useful commodity—transportation. A salesman of little ability can sell what the customer must have, but it takes real ability to sell the customer something about which he is indifferent, or of the value of which he is ignorant.
>
> Many of our patrons are not compelled to patronize our cars. They have the choice of other methods of transportation. It is our job to make transportation via the street car as safe, pleasant and speedy as possible, and so attract the greatest number of patrons. Just now we have the added incentive of a falling off in traffic, due to business depression, to spur us to increased effort to secure more riders.
>
> These things being true, what is to be thought of the trainman who deliberately turns aside (perhaps permanently) proffered business by failing to stop his car upon signal of persons desiring to ride? We know that men who do this would not long be retained by commercial houses if guilty of such action—or rather inaction—there.
>
> You are salesmen! It is your duty to sell rides. When you perform this duty you will not "pass up" any person waiting to board your car. Indeed, the person not directly at the stop, but approaching it in evident haste, should be accommodated when this is practical.
>
> Be a salesman—and a live one.

Railway Wins Track Suit

The Boston & Worcester Street Railway will not have to pay Southboro, Mass., the sum of $900 a year for 1920 and 1921 in consideration of track locations in the town, according to a recent ruling by the Supreme Judicial Court in the $1,800 suit brought by the town against the company. The Supreme Court upheld the decision of Judge Alonzo P. Weed, who found for the defendant in the Superior Court on Feb. 11, 1924. It was alleged the railway refused to pay the amount due for 1920 and 1921. The defendant claimed that the agreement was illegal and void as it was in violation of the statutes of the commonwealth. Judge Weed found that the tracks of the company in Southboro were mostly over a private way. He also found that the defendant had paid more than $900 per annum in excise tax previous to 1920, the amount levied by the town. These excise taxes were not due in 1920 and 1921 according to the statutes, the court ruled.

Traction Company Entertains Community at Christmas

More than 4,000 people attended the fourteenth annual Christmas tree celebration conducted by the employees of the Beaver Valley Traction Company, New Brighton, Pa., on Dec. 22.

A tree, claimed to be the largest ever erected in the community, was placed in the center of an enlarged dancing pavilion in Junction Park, owned by the company. The doors were opened at 6 p.m., and from then until 2 a.m. a stream of men, women and children kept coming and going.

Children from the various institutions were guests of the employees. In addition town and borough representatives, members of the various civic and social clubs and chambers of commerce in the valley were invited.

The tree was illuminated with colored lights and a large star, formed of shaded lights, was perched in the extreme top. These were in addition to the usual decorations. Artistic effects were produced by the lighting and by pine covered with cotton so placed that the hall gave the appearance of a pine forest snow-bedecked.

Santa Claus made his entrance promptly at 8:30 in a sleigh drawn by six little folks. He was joyously greeted by the children and as his sleigh moved about the pavilion the merry crowd stormed him, insisting that he open his packs of gifts forthwith.

With Santa's help the children were formed in lines of twos and after marching once around the pavilion they were taken to the basement, where lunch was served and gifts distributed. Motion pictures were then shown in the addition to the pavilion, where the latest in funny reels was used to hold the attention of the children while the pavilion proper was being used for the festivities arranged for the adults.

C. D. Smith, general manager; Grover C. Wolfe, Mrs. C. D. Smith and Miss Elma Graham received the guests.

Winnipeg Company Likely to Expand

Further extension of the Winnipeg Street Railway, Winnipeg, Man., through adjacent municipalities is one of the projects likely to be undertaken during the administration of George W. Allen, who succeeds Sir Augustus Ganton as president of the Manitoba Power Company and the railway. Reports that the railway will voluntarily be surrendered to the city upon expiration of its franchise are declared to be unofficial. The railway has been urging a 10-year renewal and is still anxious to secure a new lease. If the city does not give notice of intention to exercise its option, the franchise will be extended automatically 5 years.

Names Day for Hearing.—The Ohio Public Utilities Commission has set Feb. 5 as the date for a public hearing on the petition of J. Harvey McClure, receiver, for the abandonment of the Dayton-Union City division of the Indiana, Columbus & Eastern Traction Company. The branch line sought to be abandoned is 55 miles long.

Special Service Announced.—The Milwaukee Electric Railway & Light Company recently introduced a "business men's limited" between Milwaukee and Oconomowoc. The response was so popular that the company has announced similar special service between Watertown and Milwaukee.

Questions Eight-Cent Fare Right.—Since Federal Judge Lewis decided that the Denver Tramway, Denver, Col., has a perpetual franchise to operate its cars on the streets of Denver, basing his decision on the agreement signed by the city and the company during 1885, 1888 and 1906, the city has stated that if such be true, then those signed agreements call for a 5-cent fare and that it will insist upon this charge. Taking this stand the city will not enter into any discussion as to the valuation. Henry E. May, the present city attorney, has presented the case before Mayor Stapleton with the purpose in view of having the Supreme Court of the United States pass upon that part of the ruling by Judge Lewis in which he says that the tramway has a perpetual franchise.

Appeals From One-Man Car Ruling.—Besides being granted an injunction which authorized the present status of one-man car operation in New Haven until Jan. 6 the Connecticut Company has filed an appeal with the Public Utilities Commission from the provisions of the prohibitory ordinance. The new ruling forbids the operation on certain streets between 6 a.m. and 10 p.m. of street cars without a conductor in addition to the operator. The appeal states that the ordinance is unreasonable and null and void and that it is discriminatory because it permits the operation of one-man cars by the New Haven & Shore Line Railway in New Haven.

Merchants Make Traffic Suggestions.—As a substitute for the short looping plan advanced recently by the Pittsburgh Railways, Pittsburgh, Pa., the Downtown Business Men's Association at a hearing before the transit conference board suggested through car routing and no parking in the central business section. Establishment of one-way streets was also proposed.

Agreement Reduces Fares.—Further consolidation of fares has been accomplished by the Chicago City Railway through the operation of an agreement with the Chicago & Joliet Electric Railway, which reduces 10 cents a day the round trip fare of passengers from southwest suburbs working or shopping in Chicago. Formerly the fare was 10 cents to the city limits and then 7 cents. The new rate is 12 cents for the combined ride, of which 7 cents goes to the Joliet and 5 cents to the city company. As evidence of payment of the consolidated fare an exchange ticket is issued equivalent to a transfer.

Hearings on Ordinance to Be Announced.—The City Council of Cincinnati, Ohio, has emphasized the differences existing between itself and Mayor George P. Carrel on the Cincinnati traction situation by permitting a proposed railway ordinance to be introduced and by adopting a resolution to relieve the special street railroad committee appointed in February, 1924, from further duties. The new ordinance was introduced by Councilman William Hess, who moved that it be referred to the street railroad committee of Council for public hearings. This motion was passed unanimously on an oral vote.

Quits Bus Service to University.—The Tulsa Street Railway, Tulsa, Okla., has found it necessary to curtail its bus service by discontinuing through bus service between the business district and the Tulsa University. The reason assigned is that the cost of operation of buses was 25 cents per mile while the receipts averaged but 10 cents a mile, causing a financial loss of more than $2,500 a month. This company attempted several months ago to secure financial relief from the Corporation Commission by a fare increase, but was refused. In establishing the property valuation as the basis for rates the commission held that the bus equipment of the company could not be taken into consideration.

Grade Crossing Plans in Preparation.—The Board of Public Works of Louisville, Ky., expects to submit plans to the railroads and Louisville Railway about Feb. 1 regarding the city-wide grade crossing elimination plan in Louisville, for which a bond issue of $5,000,000 was passed by the voters last November, and on which work is to start this year. It is planned to start with the grade crossings at Fourth and G Streets, where the Fourth Street car line crosses both the Louisville & Nashville and the Southern Railroads. It is planned to complete the elimination at this one point by 1926.

Voters Favor Trolleys.—The voters of Oxford, Mass., have gone on record as favoring trolleys over buses as a means of conveyance to Worcester, the nearest big city. The sentiment of the voters was expressed at a largely attended town meeting to act on an article which if favored would have compelled the Selectmen to issue bus permits to have conveyances run in opposition to the trolleys.

Increased Number of Witnesses.—By a consistent campaign among trainmen the Los Angeles Railway, Los Angeles, Cal., has raised the average number of witnesses per accident from less than four to approximately five during eleven months. The average number of witnesses per accident, procured by trainmen, has been compiled by the claim department and published monthly in "Two Bells," the company paper. Last November four of the five carhouses turned in an average of more than five witnesses per accident. This made the average for the system 4.92. The efforts of trainmen in procuring witnesses have been watched closely by the division superintendents.

Camden Approves P. R. T. Bridge Plan.—The plan of the Philadelphia Rapid Transit Company for operation of cars over the Delaware River bridge, submitted several weeks ago to the Joint Commission, has been approved by the City Commission of Camden at a special meeting. The Camden Commissioners reserved the right to designate the streets to be occupied by the tracks and this phase of the proposal will be considered later.

Increased Fare Allowed.—The Crown Hill line, operating from a junction on the West Twenty-ninth Avenue line of the Denver Tramway, Denver, Col., and running to Crown Hill Cemetery, about three-quarters of a mile, has been granted permission by the State Public Utilities Commission to raise its fare from 5 cents to 8 cents. Tickets will be sold at two for 15 cents. The increase was granted because the line was operated at a loss. It is owned by the Denver Tramway.

Prepares for Bus Service in Suburbs.—The Kansas City Railways, through the receivers, is preparing to install bus service on two routes in Argentine, a suburb of Kansas City, Kan. The City Commissioners have granted a permit for the operation of these two bus lines. Transfers will be issued good on the street car lines on payment of 3 cents additional. The service is needed in Argentine because passengers have to walk over a bridge from one street car line to another. Six Mack street-car type buses are to be provided for the two routes in Argentine.

Railroads Must Protect Crossings.—Steam lines must protect railroad crossings and the street cars must stop at such crossings before proceeding, according to a ruling made by the Ohio Public Utilities Commission which has been received by P. E. O'Brien, general manager of the Springfield Railway, Springfield, Ohio. Copies of the ruling have also been received at the offices of the "Big Four" and Pennsylvania Railroads. The Springfield Railway asked for a ruling on the question as to whether or not the steam lines should protect the crossings, especially after the one-man cars are put in operation on the Springfield system. It has been the practice of the street railway conductors heretofore to "flag" the street cars at the crossings. Under the ruling the railroads will have to provide watchmen at the crossings.

Want Railway Service.—A demand for restoration of car service in Faulkner, near Boston, was voiced at a recent mass meeting in Malden. Louis Hammer, chairman of a protest committee, declared that great inconvenience had been caused the residents of Faulkner by an extra change from buses to cars due to the indirect traveling to Everett station. The lines to Faulkner were operated by the Boston Elevated Railway. The "L" substituted buses for the trolley lines. Patrons using the line now take the buses to Malden and there transfer to trolleys to reach the Everett terminal of the Elevated.

Want City-Owned Bus Line.—Citizens of the Rainier Valley who are protesting against the proposal of the Seattle & Rainier Valley Railway, Seattle, Wash., to establish a bus line on Rainier Avenue have made a counter proposal urging the city itself to establish a bus line from Thirteenth Avenue and Jackson Street to Henderson Street. At a public hearing it developed that the residents of the Rainier Valley district favor the bus line to supplement the railway, but oppose its establishment and operation by the Seattle & Rainier Valley Railway. Several months ago an ordinance was introduced in Council providing $18,000 for a city-owned bus line on Rainier Avenue, but D. W. Henderson, superintendent of street railways, declared the line could not be operated at a profit. Because of this and other opposition, the ordinance failed of passage. Some of the charges made against the railway are that the company refuses to sell school children's tickets for the same price that is charged by the city-owned lines and that the company is in default on its tax payments. The railway says that if the city established a bus line, as proposed, it would be in competition with the company on certain streets.

Company Must Furnish Reports.—As a result of an application for an increase in rates made by the Madison Railways, Madison, to the Wisconsin Railroad Commission, the company was required to furnish to that body monthly reports on the excess earnings, together with statements of the receipts and disbursements of this fund, and of the moneys realized from new capital. In its application, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 20, the company asked for an average minimum fare of 7 cents. This would mean a cash fare of 8 cents and sale of 17 tickets for $1. The present cash fare is 6 cents and nine tickets are sold for 50 cents. The average fare is 5.8 cents. Testimony of the company's officials divulged that the proposed improvement program would cost approximately $700,000. Spread over a period of seven years, the company must raise $80,000 a year additional funds in order to comply with the program.

Seek City Survey.—The Georgia Bus Association, Atlanta, has raised $2,000 for a survey of traffic conditions to be made by a traffic expert. The Becler report, referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 27, urged the elimination of jitneys. Jitney operators say the survey is "a brazen attempt to mislead the public concerning the real traffic situation in Atlanta."

Honors Chief at Elmira.—Employees of the Elmira Water, Light & Railroad Company, Elmira, N. Y., have a beautiful program printed on fine paper and tied with red ribbon as a reminder of a Christmas party given at Rorick's Glen on Dec. 22 in honor of Frederick Hamilton Hill, their vice-president and general manager. Mr. Hill has a more substantial reminder of the event in the form of a thoroughbred saddle horse as a token of the high regard in which he is held by his employees. About 600 people, including employees and their families, were present. A feature of the evening was the presentation of two moving pictures, "The Night Before Christmas" and "The Knight Before Christmas."

Railway Man Heads Traffic Club.—S. Russell Bowen, vice-president of the Washington Railway & Electric Company, Washington, D. C., has been chosen president of the Washington Traffic Club for the ensuing year. Mr. Bowen is counsel for the utility as well as vice-president.

Automatic Signals Will Be Used.—The Board of Public Safety, Louisville, Ky., has been empowered to go ahead with the installation of automatic or electric signal systems at street intersections without further authority from the City Council. The automatic signals, it is said, have worked better than traffic officers. They will be used at all of the congested intersections.

Makes Uniform Useful.—The Los Angeles Railway, Los Angeles, Cal., is endeavoring to increase the utility of the official uniform by making it suitable for civilian use without the conspicuous features of the official garb. Some time ago the use of brass buttons was discarded and the company insignia was transferred from the buttons to a neatly designed enamel coat lapel badge in blue and silver. The use of the badge is required only while the man is on duty. The second step to make the uniform more suitable for civilian use has been made by concealing the leather support for the pockets, without reducing the strength of the coat and trousers to any degree. The uniform is made of a good quality of blue serge.

Association Pays Claims.—The Traction and Power Mutual Aid Association, which is composed of employees of the Utah Light & Traction Company, the Utah Power & Light Company and the Phoenix Utility Company, held its annual meeting at Salt Lake City Dec. 16 and elected officers for the ensuing year. During the year 1924 the society paid death claims amounting to $2,300, and paid $2,932 sickness, accident and refund accounts to members, carrying $500 reserve and death fund for the year 1925. A surplus amounting to $8,359 was divided among the members in the form of Christmas dividends of $9.20 for each 12 months' membership.

Bill Seeks Remedy Report.—A bill calling upon the Department of Public Utilities in Massachusetts to report on the merits of several suggestions that have been made in regard to the conduct of the Boston Elevated Railway, Boston, has been filed in the Legislature by Arthur F. Blanchard of Cambridge and Van Ness Bates of Brookline. The Department of Public Utilities is asked to study the merits of a Metropolitan Transit Commission, the change from private to customer ownership, joint ownership by the public, assessments upon real estate to cover improvement charges, and of having the directors of the Boston Chamber of Commerce appoint public trustees.

Electricity in Harbor Activities.—Two electric engines for use in harbor shunting and hauling activities were brought to Montreal recently and are now being assembled in local workshops. They are the product of the English General Electric Company and are the first of several which will replace the steam engines used hitherto. With the complete electrification of the Harbor railway system of more than 20 miles in full operation in the spring of 1925, Montreal, it is said, will not only be the quickest loading and unloading port in the world, owing to the shortness of the local season, but will also be the cleanest.

Financial and Corporate

G. E. Relinquishes Utility Holdings

New Company Will Take Over General Electric Interests and Distribute Shares to G. E. Holders

The General Electric Company announced on Dec. 30 that it will dispose of its holdings in the Electric Bond & Share Company by organizing a new corporation with an authorized capital of 1,802,870 shares of no par value stock and by transferring to the new corporation 300 shares of 6 per cent cumulative preferred stock of the Electric Bond & Share Company. This stock has par value of $30,000. The General Electric Company will also transfer 250,000 shares of common stock of the Electric Bond & Share Company, being the entire common stock, having par value of $25,000,000, and now paying 8 per cent dividends.

In consideration of the transfer the new corporation will distribute its shares to stockholders of record of the General Electric Company as of Jan. 15, 1925, ratably in the proportion to their holdings; that is to say, one share of stock of the new corporation to each General Electric share.

The distribution will be made on Feb. 1, 1925, or as soon thereafter as possible, when certificates for shares of the new corporation will be mailed to all General Electric stockholders.

Dividends on the new stock will accrue after Jan. 1 and will be paid quarterly by the new corporation on the 15th day of April, July, October and January.

The present dividend rate on the Electric Bond & Share stock will justify the new corporation in paying dividends of not less than $1 a share annually.

The General Electric Company owns all the common stock of the Electric Bond & Share Company, which in itself is a holding company. Among the companies owned by the Electric Bond & Share Company either directly or indirectly are the American & Foreign Power Company and its subsidiaries, the American Gas & Electric Company and subsidiaries, the New Orleans Public Service, the Dallas Railway, the Memphis Street Railway, the Birmingham Electric Company and the Utah Light & Traction Company.

The assets of the Electric Bond & Share Company as of Dec. 31 last year were valued at $62,552,380. The company had a working capital of $24,764,782. The income of the company in 1923 was $46,546,411 gross and $30,422,561 net. It had a surplus of $14,522,380. A statement of the reasons for the change says in part:

> At the beginning of the electrical industry in the United States, it was necessary to assist in the establishmnet of electrical public service enterprises, not only in respect to engineering involved in construction, but particularly in rendering aid in financing the capital requirements of such undertakings. The General Electric Company and its predecessor companies—the Thomson-Houston Electric Company and the Edison General Electric Company—under the far-seeing and courageous leadership of C. A. Coffin, were active in this field.
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> In order to co-ordinate these activities and render its assistance to the industry more effective, the management of investments of this character was concentrated principally in the Electric Bond & Share Company, the common stock of which has always been owned by the General Electric Company.
>
> The Electric Bond & Share Company, organized in February, 1905, has grown in size and effectiveness. It was an important factor in improving central station efficiency, in reducing cost of electric service to the public and interesting a larger number of investors in the advantages of securities in this field.
>
> The conditions in the electrical industry have changed; the public now recognizes investments in electrical public service enterprises as of demonstrated safety and stability. In view of these changed conditions the principle of separating the Electric Bond & Share Company from the General Electric Company has been under consideration for a long time, and today the board of directors took action determining the method of accomplishing it.
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> The administration of the Electric Bond & Share Company will continue under the presidency of S. Z. Mitchell, to whose able, alert and resourceful leadership its conspicuous success and prosperity is in a great measure due.

Boston Has Its Biggest Day

Edward Dana, general manager of the Boston Elevated Railway, says that Dec. 20 was the biggest day in total receipts in the history of the company. Statistics just compiled show the railway turned the corner in November with $115,031 excess of receipts over cost of service. Receipts from fares on Dec. 20 were $126,558. The previous high mark was two years back with $124,718.

Revenue passengers carried in November were 24,479,948 at a 10-cent fare, 2,131,663 at a 5-cent fare and 4,121,992 at a 6-cent fare. Last year in November 24,240,628 passengers were carried at a 10-cent fare and 8,659,323 at a 5-cent fare. The totals for November were 30,733,603 in 1924 and 32,899,951 in 1923. Whether the falling off in the total number of passengers carried in November, 1924, was due to the increase of 1 cent in the fare on some of the lines could not be ascertained. There was a loss of 2,166,348 revenue passengers last November, despite the fact that 239,320 more 10-cent fares were collected. The total number of 5-cent fares in November, 1923, was 2,405,668 more than the number carried at 5 and 6-cent fares combined for November, 1924.

Receiver for Union Traction Company of Indiana

On the application of the Westinghouse Electric & Manufacturing Company, a creditor for $74,192, Arthur W. Brady, president of the Union Traction Company of Indiana, operating 454 miles of interurban and city electric railway in Indiana, was appointed receiver for the Union Traction Company in the Madison Circuit Court late on Dec. 31. It is alleged the traction company is in danger of insolvency.

Financial Readjustment Planned

Company at Columbus, Ohio, with Future in Mind Would Revamp Capital Structure

A refinancing plan is proposed for the Columbus Railway, Power & Light Company, Columbus, Ohio, to be submitted at the annual meeting of the stockholders on Jan. 27. Under it between $6,000,000 and $8,000,000 would be added to the present amount of stock.

A financial structure which will probably take care of the company for the next 20 years will be provided, according to President Charles L. Kurtz. He explained that action should be taken in order to tighten up the present structure.

Bonds of the company now outstanding amount to 58 per cent of the total of outstanding securities. If the new plan is adopted, present outstanding stock will be retired and supplanted by a new series, provided the Public Utilities Commission gives its sanction.

Funds secured from the sale of the $6,000,000 or $8,000,000 of stock would be used to replenish capital reserves which have been depleted by improvements completed during the past four years.

At present the company is engaged in the construction of a new power plant about 8 miles from Columbus. This is really a charge to capital.

The company now has a capital stock of $15,145,000, consisting of 60,800 shares of common stock, 19,138 shares of prior preference preferred stock, 21,125 shares of preferred stock, series A, and 50,387 preferred, series B, of par value $100 each.

According to the plan devised, series A preferred, of which there are 21,125 shares of a par value of $100, drawing dividends of 6 per cent, would be redeemed with an issue of first preferred of the same par value and bearing the same dividend.

Series B, a 5 per cent issue, with a provision of an additional 1 per cent after 5 per cent has been paid on the common stock, would be retired with a new series B, carrying 6 per cent dividends. Of this issue, only enough to retire the present series B, approximately $5,030,000, would be sought.

To take the place of the present common stock, which has a par value of $100, and of which there are 60,800 outstanding shares, it is planned to obtain authorization of 300,000 shares of common stock, no par value, to be exchanged at the ratio of two for one.

First preferred will be used to take care of further expansion, for which an authorization of $25,000,000 would be sought. This stock and the common stock remaining, after the present series is retired, would be used for future financing. No more first preferred can be put on the market if stockholders of more than one-fourth of the stock outstanding disapprove by vote.

In explaining the new plan to the stockholders Mr. Kurtz said:

> Sufficient funds for the company's needs cannot be raised by the sale of bonds. The only alternatives then for the raising of sufficient funds for the company's needs are:

(a) The sale of debentures, the security for which would be ahead of the rights of all stockholders. These debentures would have to be refinanced from time to time and might prove very embarrassing to the company in the future.

(b) The sale of preferred and common stocks. This latter is the plan recommended to the stockholders and the one to be considered at the coming meeting.

I. C. C. Approves Key System Valuation

The Interstate Commerce Commission has approved the method of valuation submitted to it by the Key System Transit Company, Oakland, Cal., which fixes the valuation of the federal body upon its properties. The definite figure will not be known for some time, but according to President C. O. G. Miller the valuation will be considerably in excess of the par value of all securities issued, including common stock. The total of outstanding securities is in excess of $27,500,000.

The Key System was reorganized in June, 1923, succeeding to the ownership and management of an extensive transportation system which had been in operation for many years. Six months ago, in an official statement, President Miller stated that "the present depreciated reproduction value, based upon 1918-1923 average prices of the properties comprising the system, including properties of subsidiary companies which comprise less than 11 per cent of the system's mileage, is placed at $31,900,000, which is more than two and a half times the par value of the total bonded debt, including bonds of subsidiaries."

The company's capitalization at that time included: $2,965,000 divisional and underlying bonds; $1,365,810 general and refunding mortgage, 1938, series A, 6s; $7,585,200 general and refunding mortgage 1938, series 1, 5 per cent; $2,500,000 Key System Securities Company 6 per cent collateral trust 1933 notes; $5,872,891 prior preferred 7 per cent cumulative stock; $3,699,691 7 per cent preferred cumulative; $3,262,500 common stock.

Connecticut Road to Lift Receivership

A basis for reorganization by the bondholders of the Hartford & Springfield Street Railway, Warehouse Point, Conn., is being laid in a petition to be presented to the incoming General Assembly for the chartering of the Hartford & Springfield Transportation Company.

The latter company, according to its petition, wishes "the right to acquire all or any parts of the rights, franchises and property of the Hartford & Springfield Street Railway, the Windsor Locks Traction Company and the Rockville, Broad Brook & East Windsor Street Railway, including the lines of railway now owned and operated by said companies, together with the right to operate buses in accordance with the laws of the State of Connecticut."

The company has been in receivership for several years with Harrison B. Freeman as receiver. Mr. Robinson said on Dec. 27 that the experience of the receiver seemed to indicate that the property could be operated at a profit.

Purchase Talk Revived at San Francisco

John A. McGregor, chairman of the municipal committee at San Francisco, Cal., which is considering the question of the purchase of the Market Street Railway, states that the city is ready to take up final negotiations. At a meeting which will probably be held this month the city price is expected to be made known. It is understood the city offer will be on a payment from earnings basis. Appraisal figures have been compiled with company co-operation but are being held secret.

New Financial Plan Proposed for Northern Ohio Electric

A plan of reorganization of the Northern Ohio Electric Corporation is being submitted to the stockholders providing for the formation of a new company to be called the Northern Ohio Power Company, which will issue bonds and stock and raise the necessary funds to pay the $2,680,000 loan that matures on Feb. 1, 1925. The new company will take over the assets of the present company, consisting chiefly of practically the entire outstanding $10,000,000 common stock of the Northern Ohio Traction & Light Company, which operates the city lines in Akron and an extensive system of interurbans.

The new company is to have the following capitalization:

$2,800,000 (which may be increased to $3,500,000 upon exercise of options) 10-year 7 per cent bonds due Feb. 1, 1935. To be secured by pledge of practically the entire outstanding $10,000,000 common stock of the Northern Ohio Traction & Light Company.

430,000 shares of an authorized issue of 500,000 shares of capital stock without par or face value.

70,000 options expiring Aug. 1, 1926, each ten options calling for delivery of $100 bond and 10 shares of capital stock upon payment of $100.

The plan provides for the deposit of the outstanding 60,000 shares of preferred and 75,000 shares of common stock of the Northern Ohio Electric Corporation for exchange for capital stock of the new company on the basis of:

For each share of preferred stock of the Northern Ohio Electric Corporation there will be delivered two shares of the capital stock of the new company.

For each share of common stock of the Northern Ohio Electric Corporation there will be delivered four-tenths of a share of the capital stock of the new company.

The depositing stockholders are offered for subscription:

$2,800,000 10-year 7 per cent bonds.
280,000 shares capital stock.
70,000 options.

These are to be in amounts of $100 or multiples thereof on the following terms:

$100 bonds.
10 shares capital stock for the sum of $100
2½ options.

Preferred stock depositors are entitled to prior right to subscribe pro rata with secondary right to common stock depositors subject to allotment.

A 10 per cent payment must accompany all subscriptions; 15 per cent to be paid when the plan is declared operative, 25 per cent each in two, four and six months thereafter, interest at 6 per cent to be adjusted at the time of final payment.

The entire subscription has been underwritten for a commission of 5 per cent, thus assuring the receipt of funds necessary to pay the $2,680,000 loan due Feb. 1, 1925. Upon exercise of the 70,000 options, the new company will be provided with $700,000 additional capital.

Interest Defaulted by Michigan Electric Railway

The Michigan Electric Railway, Jackson, Mich., was unable to pay the six months interest due Jan. 1 on its first and refunding mortgage 5 per cent bonds. The following protective committee has been appointed:

Willard V. King, chairman of the advisory board of the Irving Bank-Columbia Trust Company; Livingston E. Jones, president of the First National Bank of Philadelphia; J. Peyton Clark, engineer; George R. Cottrelle, Toronto; Marvyn Scudder of Marvyn Scudder & Company; Noah MacDowell, representing Investment Registry, Ltd., London; William F. Ingold of Pynchon & Company; W. M. Flook, New York; Sydney W. Noyes, vice-president of the New York Trust Company, and Bernard C. Cobb, vice-president of Hodenpyl, Hardy & Company, Inc.

North Shore Road Calls Securities for Redemption

Notice has been served by the Chicago, North Shore & Milwaukee Railroad, Highwood, Ill., that it is prepared to redeem all of its outstanding series "A" 10-year secured sinking fund gold notes dated June 20, 1920; all of the outstanding series "B" 15-year secured sinking fund gold notes dated June 1, 1920, all of the outstanding series "C" 3-year secured sinking fund gold notes dated June 1, 1920, and all of the outstanding 1-year 6 per cent gold notes dated June 16, 1924.

Arrangements to carry out this refunding were recently made by the company through the sale to the National City Company and Halsey, Stuart & Company, Inc., of an issue of $7,000,000 first and refunding mortgage bonds dated Jan. 2, 1925, and due Jan. 1, 1955. As noted in the ELECTRIC RAILWAY JOURNAL for Dec. 20, 1924, page 1058, these bonds bear 6 per cent interest. They were offered to investors at 98 and interest to yield 6.15 per cent.

New Financing Proposed by Boston Elevated

The Boston Elevated Railway, Boston, Mass., has petitioned the Public Utilities Department for authority to issue $2,141,000 of 6 per cent bonds, for a term of thirty years, to pay the short term indebtedness incurred in certain capital improvements in connection with the South Boston power plant, the Everett repair shops and the Forest Hill plant and to finance expenditures necessary to be made to permit the use of the Shawmut branch, so that it may be able to borrow money on favorable terms for the rolling stock for that branch. There is provision for this plan in the special legislation enacted last year. The Public Utilities Department has held a hearing on the petition. No opposition to the plan developed.

$200,000 Equipment Trust Issue by New York Interurban

Another issue of equipment trust obligations is being offered. The issuing corporation is the Buffalo & Erie Railway, the successor to part of the property of the old Buffalo & Lake Erie Traction Company, sold under foreclosure some time ago. The total amount of the issue is $200,000. The offering price of the bankers, Bown & Company, ranged from 100 and interest to 100¾ and interest, to yield 4½ to 6 per cent, according to maturity. The financing has been approved by the Public Service Commission of New York. The equipment on which the certificates are a lien include 14 double-truck passenger cars, four single-truck passenger cars, and two Russell snow plows. The equipment is estimated to cost $285,000, or more than 142 per cent of the face value of the certificates. It is explained that the 18 new cars, being built by the Cincinnati Car Company, are of the so-called "Lexington" type. The certificates mature semi-annually at the rate of $10,000 between June 15, 1925, and Dec. 15, 1934.

Company Named to Acquire Stock.—The Associated Gas & Electric Company of New York, it is stated, plans to acquire the outstanding preferred and common stocks of the New Hampshire Electric Railways, Haverhill, Mass., one of the principal companies of which is the Massachusetts Northeastern Street Railway, operating 127 miles of line. A committee of stockholders was recently formed to arrange a sale of the preferred and common shares. An offer of $32 a share for the preferred and $3 for the common was referred to previously in the ELECTRIC RAILWAY JOURNAL.

Payment on Tax Made.—First payment on $437,500 which the Cincinnati Traction Company, Cincinnati, Ohio, owes the city of Cincinnati as franchise tax from Oct. 1, 1923, was received by the City Auditor on Dec. 27. The check was for $350,000. Officials of the traction company announced that another $87,500 would be paid before Jan. 15. The voucher recited that the amount was borrowed under legal authority and would be repaid during 1925, one-twelfth monthly, with interest out of subsequent gross receipts.

Another Move Toward City Purchase.—Final authority to purchase the equipment of the New York & North Shore Traction Company, Roslyn, L. I., for $17,650 has been granted by the Board of Estimate of New York City to William Wirt Mills, Commissioner of Plant and Structures. Before the city can go ahead with its plans to operate the line between Flushing and Whitestone certain private rights of way must be purchased. So far no action has been taken on this matter.

Youngstown Company Doing Better.—Figures presented recently show that the railway situation in Youngstown, Ohio, is improving since the jitneys were barred from the center of the town. The first seven days after the jitneys stopped running, street car receipts increased at the rate of $19,000 a month. The prospect now is that December will not show a loss. For the entire year, however, the loss will be between $200,000 and $220,000. Last year it was $208,000. In discussing the affairs of the Youngstown Municipal Railway the *Vindicator* in its issue of Dec. 12 said that with the jitneys abolished the expectation is that in 1925 the railway system will pay its own way. Incidentally, it has been arranged for the return of the North Avenue power house by the Municipal Railway to the Pennsylvania-Ohio Electric Company for $600,000, this amount to be deducted from the capital valuation of the municipal lines. In addition new equipment will be installed at a cost of about $200,000 by the Pennsylvania-Ohio Electric Company at North Avenue. The improvements will include a new substation and entirely new switching facilities.

Approves Interest Payment.—Federal Judge Faris has approved the application of Rolla Wells, receiver of the United Railways, St. Louis, Mo., to pay $1,212,000 interest on the issue of $30,300,000 of United Railways 4 per cent bonds. The interest dates are July 1, 1924, and Jan. 1, 1925. Judge Faris failed to act on the request of Receiver Wells to refund holders of St. Louis Transit Company bonds $624,000 which they paid in July on the interest due on the general bonds on Jan. 1, 1924. This latter payment was opposed by Rhodes E. Cave, attorney for the holders of the general 4s.

Assessment Higher.—The board of equalization on taxes after conferences with the Louisville Railway, Louisville, Ky., reached a conclusion regarding assessment of company property. It was fixed at $12,924,633. This is $1,034,633 more than last year and $934,633 more than the assessment of two years ago, which was the first under the 7-cent fare.

$5,000,000 Stock Offered.—The United Light & Railways Company of Delaware recently offered a new issue of preferred stock, incident to acquiring control of the Continental Gas & Electric Corporation, which recently took over the Kansas City Power & Light Company and the Columbus Railway, Power & Light Company, Bonbright & Company are placing the issue, which consists of $5,000,000 of 6½ per cent cumulative prior preferred. The United Light & Railways Company is controlled, through the ownership of all its common stock, by the United Light & Power Company, a Maryland corporation, which controls and operates a group of properties furnishing various utility services in 97 Middle West communities. The new prior preferred stock issue has a par value of $100 a share and will be acceptable at par in payment for class A common stock of the controlling company, the United Light & Power Company at $50 a share up to March 1, 1925; at $55 a share thence to March 1, 1927, and at $60 a share thereafter up to and including March 1, 1929.

Pays the City.—The Denver Tramway, Denver, Col., has paid the city of Denver $162,323, back franchise taxes. Under a court ruling the receiver must pay this $5,000 tax every month.

November Shows Surplus.—The report for November of the Tacoma Municipal Street Railway, Tacoma, Wash., showed a balance in favor of the city for the first time since the year 1918. The gain was $26. Operating revenues, the report showed, were $5,463, with operating expenses $3,256. Claims, charges, depreciation and interest on bonds used up the remainder of the surplus. This bears out the claims made for the belt line by the traffic bureau of the Tacoma Chamber of Commerce. A careful analysis of the November business shows that of the 680 cars switched by the belt line during November, only 472 would have been switched by the municipal line under former conditions.

Part of Route Abandoned. — The Geneva, Seneca Falls & Auburn Railroad, Inc., through L. G. Hoskins, attorney, Geneva, N. Y., has filed a certificate in the office of the Secretary of State at Albany declaring a portion of its route of about a mile on Stevenson Street abandoned.

On Board of Trustees.—George P. Bullard, Newton, was recently appointed by Governor Cox to fill the vacancy on the board of trustees of the Eastern Massachusetts Street Railway, Boston, Mass., caused by the resignation of Isaac Sprague, Wellesley.

Vote to Increase Capital Stock.—At a special meeting of the stockholders of the Cumberland County Power & Light Company, Portland, Me., which operates the Portland Railroad, it was voted to increase the outstanding capital stock of the company by an issue of 6 per cent preferred stock not to exceed $500,000 in amount. This proposed issue will go before the Public Utilities Commission for approval. It was also voted by the stockholders to authorize the directors of the company to arrange for the exchange of any such preferred stock at par for any of the $500,000 of 4½ per cent first mortgage consolidated electric light company of Maine bonds, falling due Jan. 1, 1925, or to arrange for the sale of such stock or any portion of it which may be deemed necessary to apply toward the payment and redemption of any portion of the bond issue. The stockholders also ratified and approved of the action of the directors in causing to be offered to its common stock holders of record Nov. 22, 1924, the privilege of subscribing at the rate of one share for ten of existing holdings to non par value common stock at the price of $75 per share.

Reading Company Changes Its Name.—W. S. Barstow & Company, New York, announce that the name of the Reading Transit & Light Company, Reading, Pa., subsidiary of the General Gas & Electric Corporation, has been changed to the Reading Transit Company. The new company is offering, through its investment department, $1,250,000 of first and refunding mortgage 30-year 5 per cent gold bonds, series A, due Nov. 1, 1964. It also has arranged to pay the $400,000 first mortgage 5 per cent 30-year gold bonds of the Reading & Womelsdorf Electric Railway. The holders of these bonds have the privilege of exchanging them for the new issue of Reading Transit 6s.

Legal Notes

FEDERAL COURT—*Constitutionality of Rate Statute.*

It is within the power of a legislature to prescribe the form of charges by a gas company, so that a statute prohibiting a "service charge" is in itself constitutional and valid. But a law passed by the New York Legislature in 1923, relating to the price and quality of gas as furnished by gas companies in New York City (cc. 898,899) is confiscatory and therefore unconstitutional, as applied to the companies considered. [New York & Queens Gas Company vs. Prendergast 1 (2d) Federal Rep., 351, also Bronx Gas & Electric Company vs. Prendergast et al, 1 (2d) Federal Rep., 377.]

FEDERAL COURT—*The Paving Clause in a Franchise Is a Contract.*

This case arose through a plea by abutting property owners that the railway operating in a street should be required to do the paving specified in its franchise. The court held that the ordinances of a city may be local laws or they may constitute contracts. Where a franchise is accepted by a utility it constitutes a contract. Hence, the suit in question is not one to require the defendant to perform a public duty required by law but for specific performance of a contract. [State of Washington et al. vs. Seattle & R. V. Ry. 1 (2d) Federal Rep., 605.]

GEORGIA—*Duty to Passenger Occupying Dangerous Position.*

A railway company has a right to prohibit passengers from occupying positions on its cars considered to be dangerous, except at their own risk, but when passengers are permitted and in some instances required to occupy such positions, the company is under the duty to exercise extraordinary care and diligence for their safety. Hence, when a passenger, standing on the steps of a car, is struck by an automobile caught in a rut close to the railway right-of-way, the company is responsible. [Bailey vs. Georgia Ry. & Power Co., 124 Southeast Rep., 907.]

KENTUCKY—*Person Riding on Running Board of Automobile Not Negligent.*

A person riding on the running board of a crowded closed automobile with his head in the window is not necessarily negligent in so doing, and if injured by a street car while so riding, the company is responsible. [Paducah Railway vs. Nave, 265 Southwest. Rep., 289.]

MASSACHUSETTS—*Improperly Registered Automobile a "Nuisance."*

The owner of a touring car removed the body and put on a truck body, for temporary purposes, without changing the registration or license plate. As the result of a collision with another automobile, the changed car fell into an excavation made by a railway company. The defense of the latter was that the owner of the automobile was a trespasser, without right upon the highway because his automobile was not legally registered. This position was upheld by the court. [Nichols vs. Holyoke Street Ry., 145 Northeast Rep., 33.]

MASSACHUSETTS—*Person Slipping on Step of Station.*

Where a passenger slips on some slippery substance on the step of a station, and where there is no evidence as to what the substance was or how long it had been on the step, the company cannot be considered to have been negligent. [O'Brien vs. Boston Elevated Railway, 145 Northeast. Rep., 259.]

MICHIGAN—*Injury to Passenger While Acting as Witness to Accident.*

A passenger who witnessed an accident was injured while standing by the side of the trolley car and signing his name to a witness slip at the request of the conductor. The company was held responsible for him as a "passenger" although the conductor had not invited him to leave the car. [Moffatt vs. Grand Rapids Railway, 200 Northwest. Rep., 274.]

MISSOURI—*Employees Alighting in Middle of Block.*

It is negligent for a motorman to open the platform door between customary stopping points and to allow a trainman to get off at such point, and when such alighting trainman stepped in front of or directly against a boy riding a bicycle and caused him to fall under the wheels of the car, the company was responsible. [Gilman et ux vs. Fleming et al, 265 Southwest. Rep., 104.]

NEW JERSEY—*Damages from Collision Between Truck and Street Car, Where Both Were Probably Driven Negligently.*

In this case a street car and loaded truck ran into each other through what was probably negligent driving of both. A passenger on the trolley car, who was injured, sued both trolley company and truck owner, and the decision of the jury against only the trolley company was sustained. [Doherty vs. Public Service Ry. et al, 126 Atlantic Rep., 466.]

NEW JERSEY—*Testimony of Physician Not Always Admissible.*

Declarations by a patient as to his symptoms, made to his physician for the purpose of treatment, are admissible in evidence, but where the statements are made on the day preceding the trial for the sole purpose of enabling the physician to testify at the trial as to the plaintiff's symptoms, as described by him, the testimony is hearsay and inadmissible. [Hutchinson vs. Jersey Central Traction R. Co., 126 Atlantic Rep., 482.]

NEW JERSEY—*Responsibility at Crossing Determined by Jury.*

In this case the railway operated over a private right-of-way close to the highway and passed cross streets at grades. A motorcycle rider was struck while attempting to cross in front of a car at a cross street and three juries awarded the plaintiff damages. Two of these awards were set aside, but the court allowed the third verdict to stand. Death of the plaintiff in the meantime did not abate the action. [Hutchinson vs. Jersey Central Traction R. Co., 126 Atlantic Rep., 481.]

NEW JERSEY—*Riding with Intoxicated Automobile Driver. Degree of Care Required of Motorman.*

The plaintiff in this case was riding as a passenger in an automobile when he was injured by a trolley car. There was a verdict for him against the railway company in a lower court, but the Supreme Court upheld two grounds for appeal. One was the defense that the plaintiff was guilty of contributory negligence because he knew that the man driving the automobile was intoxicated. In developing this defense, defendant's counsel asked a witness if the driver was under the influence of liquor, but the court sustained an objection to this question, saying the witness would have to qualify as an expert. This was held by the Supreme Court to be erroneous, as ability to recognize such condition does not require special knowledge or skill. The other ground of appeal upheld was that the court charged that the defendant was liable if the jury believed the motorman could have stopped the car before striking the automobile after seeing it. This charge was held erroneous because the test was whether, in the exercise of reasonable care, he ought to have stopped it and could have stopped it. [Searles vs. Public Service Railway, 126 Atlantic Rep., 465.]

TENNESSEE—*Paving Ordinance Valid for Track in Easement.*

Where a deed conveyed a strip of land to a county for use as a public road or street, but subject to a 20-ft. "easement" to a street railway company for its tracks, it was held that the title to the ground included in the easement vested in the county. Consequently, after a city was incorporated, it had the power to require the company to pave between and alongside its tracks. [City of Memphis vs. Elgin, 299 Federal Rep., 564.]

TEXAS—*Necessary Protection at Highway Crossing on Interurban Railway.*

In the absence of statutory requirements, an interurban electric railway need not maintain a watchman, electric bell or gate at a crossing, unless it is unusually dangerous. The operation of an electric car over an unobstructed highway crossing in the country at 60 m.p.h. does not constitute negligence. If the consent of the county authorities is required before such a track can be built across a public road, the failure of the company to obtain such consent cannot be regarded as the approximate cause of a collision with a motor vehicle at the crossing, as trespass on the highway would constitute a nuisance, of which only the public could complain. [Smith vs. Galveston-Houston Electric Railway, 265 Southwest. Rep., 267.]

Personal Items

Duties Realigned

Louisville Officials Promoted by Board of Directors—Title of General Manager Conferred on F. H. Miller

Frank H. Miller, vice-president in charge of engineering and maintenance of the Louisville Railway, Louisville, Ky., was made vice-president and general manager of the company Jan. 1. Samuel Riddle continues as vice-president in charge of transportation of the Louisville Railway. R. H. Wyatt, general superintendent of the Louisville & Interurban Railway, a subsidiary of the Louisville Railway, has been named acting manager of that company. These changes, announced recently by President James P. Barnes, were made merely to simplify operation of the company. The title of general manager is a new one. Both Mr. Miller and Mr. Wyatt will have authority over operating and maintenance departments.

New Executives Men of Wide Experience

Mr. Miller, the first official of the company with the title of general manager, has been with the Louisville property since the fall of 1895. He started in the car repair shops and occupied the positions successively of timekeeper, storeroom man, car tester, truck repair man, assistant superintendent of the power station and then superintendent of power. When James P. Barnes became the president of the Louisville Railway in 1920 Messrs. Miller and Riddle assumed the duties of vice-presidents. It was said in the JOURNAL at that time that three practical operators of proved ability as traction executives had been chosen to manage the electric railway system at Louisville.

It was in 1910 that Mr. Riddle, who continues as vice-president in charge of transportation, became associated with the Louisville Railway as superintendent of transportation. In preparation for this post he had many and broad experiences, first becoming identified with a prominent consulting mechanical engineer and then carrying his theoretical training into practical channels in the services of the United Gas Improvement Company. In 1903 he was in charge of the erection of buildings and installation of equipment for the Connecticut Railway & Light Company. Later he was connected with the Rhode Island Company, the Chicago, South Bend & Northern Indiana Railway and then with the Philadelphia Rapid Transit Company. It was from Philadelphia that he went to the Louisville Railway.

R. H. Wyatt, new acting manager of the Louisville & Interurban Railway, was promoted to the newly created position of general superintendent of the interurban system in 1921. Prior to that and since 1910 he had been general freight and passenger agent. Mr. Wyatt is one of the veterans of the local system. He has served more than 40 years with the Louisville company. The Louisville Railway embraces 188 miles of city track and 102 miles of interurban line.

Charles H. Allen Goes to Chicago as Comptroller

Charles H. Allen appointed comptroller Chicago Surface Lines, as referred to in the ELECTRIC RAILWAY JOURNAL, issue of Dec. 27, 1924, has been connected with the auditing department of Stone & Webster, Inc., since 1906. At first he occupied his time with mere routine duties in connection with concerns that Stone & Webster manage or control, but in later years he handled vast amounts of confidential work of appraisals, valuation for rate-making purposes, bank reports, consolidations and reorganizations. This character of work has kept him in contact with great projects of transportation, public utilities and industrials all over the country, and it may not be far afield to say that the value of properties which he has studied and investigated as the financial representative of Stone & Webster in the last few years aggregate $2,000,000,000.

Charles H. Allen

During the World War Mr. Allen was stationed at Hog Island for eighteen months. There he served on the staff of A. R. Patterson, who was vice-president and treasurer, and in 1921 he was associated with Mr. Patterson again in a financial study of the affairs of the Commonwealth of Massachusetts under the direction of a commission appointed by Governor Cox. E. S. Webster served as chairman of that commission. This work for the state led to the creation of the present Commission on Administration and Finance.

Prior to his connection with Stone & Webster, Inc., Mr. Allen was traveling auditor for companies which operated railways, gas and electric light and power companies in southern New England. Some of these concerns were later absorbed by the New York, New Haven & Hartford Railroad. He began his career as an auditor in Connecticut.

Journal Staff Changes

Henry W. Blake, who has been with ELECTRIC RAILWAY JOURNAL since 1891, will more completely retire from active responsibility in the production of the paper effective Jan. 1. This is following out the wish he has held for several years back. Morris Buck is promoted from associate editor to managing editor and J. A. Miller, Jr., from assistant editor to associate editor.

Mr. Blake has wanted to be relieved of the active administration of the editorial work, so that he might devote more time to his personal activities and to phases of editorial work in which he has particular interest. During the past few years he has continued as co-editor of the paper, leaving the executive responsibility largely to his associate. Now he will carry out his desire further by retiring as editor. But the JOURNAL is, indeed, fortunate in that it will continue to have the benefit of Mr. Blake's long experience in the industry as he will give some of his time to the active staff work.

As an editor Mr. Blake has for many years been pre-eminent in the field of technical journalism. He has been with the paper almost from its beginning, and with James H. McGraw has been in large measure responsible for the position it holds in the industry. In fact, as one of his long-time associates put it: "Mr. Blake has written his very life into the columns of the ELECTRIC RAILWAY JOURNAL, which stands as a monument to his 30 years' endeavor." In his career as editor he has stood out for the charm of his personality, for his extensive knowledge of the field and for his willingness to impart to others his information on the subjects connected with the transportation industry.

A graduate of Yale in 1886 as a civil engineer, Mr. Blake took a course in electrical engineering at Massachusetts Institute of Technology, after which he became connected with the Sprague Electric Railway & Motor Company, which was then engaged in constructing electric railways in various cities in the United States. From the time he joined the staff of the JOURNAL in 1891 until the present his career and the record of the JOURNAL are almost synonymous.

Morris Buck, for the last two years associate editor of the JOURNAL, becomes managing editor. Prior to joining the staff Mr. Buck was associated with John A. Beeler of New York for seven years in consulting engineering work. In this connection he had charge of important investigations of electric railways throughout the country, including surface, rapid transit and interurban lines. Among the properties which he studied are those of Boston, the Eastern Massachusetts, New York, Philadelphia, Washington, Newark, Richmond, Chicago, Kansas City, New Orleans and others. This work included a wide range of operating, engineering and financial problems, and was done for railways and public officials.

The earlier experience of Mr. Buck included work as engineer for the Westinghouse Electric & Manufacturing

Company and the Mechanical Appliance Company, cost analyst for the Mellon National Bank of Pittsburgh and special apprentice with the Delaware, Lackawanna & Western Railroad. For six years before taking up consulting work Mr. Buck was assistant professor of railway electrical engineering at the University of Illinois. At this time he became well known in the electric railway field for original work done in the solution of electric railway engineering problems by graphical methods and for his text-book, "The Electric Railway." Other teaching experience of Mr. Buck included a year as professor of electrical engineering at Clarkson College of Technology, two years as assistant professor of electrical engineering at New Hampshire State College and one year as instructor at Cornell. He is a graduate of the last university in mechanical engineering, class of 1904, and of the University of Illinois in electrical engineering, class of 1917.

John A. Miller, Jr., who has been assistant editor for two years, becomes associate editor. Prior to joining the paper he was an engineer in the traffic department of the Public Service Railway, Newark, N. J. He entered the service of the railway by taking a course as "cadet engineer," and was one of a comparatively small number of men to complete the full course. He was employed in the maintenance-of-way department, the power houses, the distribution department, the car shops, the time-table department and the traffic department. After he completed this work Mr. Miller served as assistant supervisor at the Montclair carhouse, was in charge of the trainmen's instruction school at Hoboken and was a special instructor on safety cars at Paterson.

Mr. Miller received his early education at the Newark Academy, following which he took the civil engineering course at Yale, graduating in 1915. He served with the First New Jersey Cavalry on the Mexican border in 1916 and was in France during the World War as second and first lieutenant of the 104th Engineers.

Personnel Changes in Benton Harbor

Changes in the management of the Benton Harbor-St. Joe Railway & Light Company, Benton Harbor, Mich., are as follows: George N. Tidd is vice-president, along with Thomas F. English, who has been general manager. Frank B. Ball is secretary and treasurer and R. J. Brown has succeeded J. C. Rohl as superintendent of overhead construction.

G. E. Matt is comptroller of the Oklahoma Union Railway, Tulsa, Okla. E. C. Van Valkenburg is assistant to the general manager. J. A. Ladd is roadmaster and E. D. Nelson is master mechanic. E. F. Blanchard is superintendent of claims, replacing F. E. Kirkpatrick.

W. L. Weston, recently manager of the Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S., has accepted a similar position at Woonsocket, R. I.

T. Fitzgerald Elected Vice-President at Pittsburgh

Thomas Fitzgerald, general manager of the Pittsburgh Railways, Pittsburgh, Pa., has in addition been elected vice-president of the company. Mr. Fitzgerald has been manager of the company since last February. His traction activities date back to 1899, but were interrupted by the war. Following his discharge from the army as lieutenant-colonel in 1919, he opened offices in Pittsburgh as consulting electric railway engineer. During the past few years he has made a comprehensive study of the Pittsburgh Railways system and assisted in the plans for the reorganization. He is a great believer in the efficacy of merchandising transportation, and it was in accordance with ideas advanced by him that the commercial department of the company was organized, as described in the issue of the ELECTRIC RAILWAY JOURNAL for April 19, 1924, page 620.

Mr. Fitzgerald was born and educated in Baltimore, graduating from Johns Hopkins University with the degree of Bachelor of Arts in 1898, after which he took one year of post-graduate work. The following year he served as inspector of the Third Avenue Railroad, New York, and then accepted the position of superintendent of the Fairmont & Clarksburg Electric Railroad in charge of railway and electric lighting activities, a position he held until 1902. During the next year he was made general superintendent of the Portsmouth district of the Norfolk, Portsmouth & Newport News Company, in charge of railways and electric lighting in Portsmouth, and Norfolk county ferries, operating between Norfolk, Portsmouth and Berkley, Va. He also was engaged in special work reporting on physical and operating conditions of the Roanoke Railway.

From 1903 to 1905 Mr. Fitzgerald served as general manager of the Lexington Railway, Lexington, Ky. In 1908 he transferred his activities to Cincinnati, becoming purchasing agent and assistant to vice-president of the Ohio Traction Company, Cincinnati Traction Company, Cincinnati Car Company, Cincinnati Northern Traction Company and the Indiana, Columbus & Eastern Traction Company. He was promoted in 1907 to assistant general manager of the Ohio Traction Company and Cincinnati Traction Company, which post he retained until 1913, when he was made general manager of these two companies. While serving as general manager he was called upon to make a number of reports on the operating and physical condition of the Columbus, Buckeye Lake & Newark Electric Railway, the Columbus, Newark & Zanesville Electric Railway, the Indianapolis & Northwestern Traction Company and the Columbus & Lake Michigan Railroad.

H. P. Garland has succeeded Charles H. Prescott as president of the Biddeford & Saco Railroad, Biddeford, Me. J. B. Stride, besides performing the duties of treasurer and secretary, is now claim agent. E. O. Hill, formerly superintendent and purchasing agent, now is title of general superintendent.

F. D. Hunt, traffic manager of the Portland Electric Power Company, Portland, Ore., since 1908, is also performing the duties of general manager of the Willamette Valley Southern Railway, Oregon City, Ore. Mr. Hunt has been in the railway business since 1894.

Henry W. Darling has resigned as treasurer of the General Electric Company, Schenectady. In accepting the resignation the directors elected him a vice-president with such duties as shall be assigned to him by the president. Mr. Darling has been intimately associated with the financial affairs of the General Electric Company from the time the company was organized in 1892 by the consolidation of the Edison General Electric and the Thomson-Houston companies. He became identified with the Edison interests in the winter of 1890-91, with headquarters in New York.

R. S. Murray has been elected treasurer of the General Electric Company, Schenectady, N. Y., to succeed Henry W. Darling. Mr. Murray entered the employ of the General Electric Company in 1893, a year after its organization. He was first attached to the Boston office. In 1899 he went to Australia and from there to South Africa in connection with the formation of the Australian General Electric Company and the South African General Electric Company. In October, 1907, he went to Schenectady and three years later became assistant treasurer.

J. Norman has been appointed auditor of the Montreal & Southern Counties Railway, effective Dec. 1. His headquarters are at St. Lambert, Que.

Lawrence Killam of the Royal Securities has become manager of the Nova Scotia Tramways & Power Company, Ltd., Halifax, N. S. Mr. Killam was formerly manager of the Inverness Mines, N. S.

William A. Gill will retire in January as vice-preaident and a director of the Columbus Railway, Power & Light Company, Columbus, Ohio. Mr. Gill has been a member of the board for the last eleven years. While he has recently disposed of his common stock holdings in the company, Mr. Gill retains a large interest in the preferred stock. He is in his eighty-third year.

Obituary

Frank O'Keefe, who was division superintendent of the Fresh Pond Division of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., when he retired from active service on June 25, 1919, is dead. Mr. O'Keefe spent about 37 years in active service on the surface lines of Brooklyn, starting about 1882 as a tow-boy on the Smith Street line. He was 57 years old.

Cyrus C. Marsh, until recently general manager of the Blue Ridge Traction Company, Allentown, Pa., a position he held for 15 years, died on Dec. 9, following an illness of two years. Besides his connection with the traction company, Mr. Marsh was a director and one of the organizers of the Citizens' National Bank, Slatington, Pa. He was 63 years old.

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

New Headquarters Building at Davenport

Erection of a five-story fireproof office building to house the increased headquarters personnel of the United Light & Power Company has been announced by B. J. Denman, vice-president of that company. The building will cost about $500,000. It will be located at Second and Perry Streets, a site which is centrally located and readily accessible from any part of the city.

This structure will be the first wing of a building that eventually will be eight stories high, cover a city block in frontage and cost $2,000,000. The building now to be begun will have a frontage of 132 ft. and a depth of 98 ft. In addition to housing the executive offices of the United Light it will also be occupied by the personnel of the Peoples Light Company and of the Tri-City Railway.

There will be two entrances, one to the office building and the other to the retail salesroom of the Peoples Light Company, which will occupy a considerable portion of the first floor. The office of the railway cashier will also be at the rear of the ground floor. On the second floor, grouped about a balcony, will be the private offices of the executives of the Peoples Light Company and the operating officials of the Tri-City Railway.

On the third floor will be located the private offices of Vice-President Denman, General Manager H. E. Weeks of the securities department and his assistants.

The offices and working rooms of the engineering department and the private offices of G. T. Shoemaker, electrical engineer, also the statistical offices, will be located on the fourth floor. The fifth floor space has not yet been assigned.

Big Sales for Fageol Motors

The Fageol Motors Company reports total sales for the first eleven months of 1924 in excess of $4,044,000. Two new factory units have been added, one a new brick building in Oakland, which more than doubles the company's coach assembly space, and a chassis plant at Kent, Ohio, where Fageol Safety Coach chassis are being made for delivery to the Fageol Motors Company of Ohio, a separate corporation, which builds the bodies and markets the complete coaches in the territory east of the Rocky Mountains.

Rolling Stock

Arkansas Central Power Company, Little Rock, Ark., has received eight new one-man safety type cars, bids for which were referred to in the ELECTRIC RAILWAY JOURNAL, issue of June 7, 1924. The cars were built by the American Car Company, St. Louis, Mo., and cost, on delivery, $15,000 each. The seating capacity of each is 44. The body construction is of steel and the cars are equipped with safety devices.

Track and Line

New York, N. Y.—The Board of Transportation approved the form of contract and directed the advertisement for bids for the construction of two sections of the Washington Heights subway line. One section is under Eighth Avenue from 112th Street to 122d Street and St. Nicholas Avenue. Bids for the construction of this section will be received on Jan. 26, 1925. The other section runs along St. Nicholas Avenue from 122d Street to 133d Street. Bids for the construction of this section of the line will be received on Jan. 29, 1925.

Boston, Mass.—The Metropolitan Planning Division has submitted a report to the Massachusetts Legislature recommending that the Boston Elevated Railway extend its rapid transit service from Governors Square before it spends much money in developing the service from Everett and to Malden. It also says that the Lechmere Square extension through Somerville and Arlington and Lexington should be made before the Malden line improvement is carried out because of the larger population that will be served. On the matter of taking over the Saugus branch of the Boston & Maine Railroad the planning board takes the position that it should not be attempted without further studies. It is suggested that it would be too expensive for the Elevated to take the whole branch, and to take only a part of it does not meet with approval from the Boston & Maine. The division wants another year to study this problem. It opposes the proposition to build an underground station in Everett, and says that the present surface station is giving reasonably good service.

Trade Notes

Diamond Power Specialty Corporation, Detroit, Mich., has appointed the Midwest Machinery Company, 104-106 South Main Street, St. Louis, Mo., as its representative for the territory of Missouri, adjacent to St. Louis, south of and including Springfield and Decatur, Ill. The Midwest Machinery Company includes among the members of its staff of officials Messrs. Stone and Proetz, men widely known in the power plant equipment field.

C. B. Starr has joined the Robert June Engineering Management Organization, 8835 Linwood Avenue, Detroit, Mich. He was assistant mechanical engineer with the Duff Manufacturing Company of Pittsburgh and later served in the capacity of sales engineer with the Detroit office of the Wayne Tank & Pump Company.

Laclede Steel Company, St. Louis, Mo., has sold its forging plant at East St. Louis, Ill., to a new company to be known as the St. Louis Forgings Company, a subsidiary of the Standard Forgings Company, Chicago, with the same general officers as the Standard Forgings Company. The production of car and locomotive axles and forgings and the operation of the plant generally under the new ownership will be continued as heretofore. The St. Louis Forgings Company opened an office on Jan. 2, 1925, at 521 Security Building, St. Louis, Mo., through which information respecting sales and deliveries may be obtained, and thus the company will keep in close contact with customers in the St. Louis district and the Southwest. The general offices of the company will be in the Railway Exchange Building, Chicago.

Economy Electric Devices Company, Chicago, Ill., has received an order from the Nashville Railway & Light Company, Nashville, Tenn., for additional Economy meters with which to equip completely all active motor cars. The present order comes as a result of the successful use of meters on several lines during the past two years and covers approximately 140 meters for delivery and installation during 1925. An order was also received from the Aurora, Elgin & Fox River Electric Company, Aurora, Ill., for 56 additional inspection dial Economy meters with which to equip all remaining active cars.

New Advertising Literature

Monitor Controller Company, Baltimore, Md., has issued Bulletin 67, describing the Monitor edgewound resistor. The bulletin states that this new resistor is especially well adapted to use on electric cars and electric locomotives. Its advantages as compared with the cast-iron grid are discussed in the bulletin.

Metal, Coal and Material Prices

Metals—New York	Dec. 31, 1924
Copper, electrolytic, cents per lb	14.90
Copper wire base, cents per lb	17.25
Lead, cents per lb	9.70
Zinc, cents per lb	8.12
Tin, Straits, cents per lb	58.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$4.075
Somerset mine run, Boston, net tons	2.15
Pittsburgh mine run, Pittsburgh, net tons	1.875
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.925
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft	$6.75
Weatherproof wire base, N.Y., cents per lb.	18.50
Cement, Chicago net prices, without bags	2.20
Linseed oil (5-lb. lots), N. Y., per gal	$1.18
White lead in oil (100-lb. keg), N. Y., cents per lb., carload lots	0.157
Turpentine (bbl. lots), N. Y., per gal	0.85

1925 1925

Braking Resolutions

PEACOCK BRAKES

Investigate Now!

Speaking of New Year's resolutions—we ask you only to resolve upon a careful study of the hand brake problem for your cars—both new and old. Investigate the *adequacy*, the *safety* and the *maintenance cost* of your present equipment. Look into the experience of other companies which have found Peacock Brakes to be the road to true economy and safety.

To the entire industry we extend our best wishes for a full share of success and prosperity throughout the ensuing year.

National Brake Company, Inc.

890 Ellicott Square, Buffalo, N. Y.

Bankers and Engineers

"On sche

Nuttall
Standard Helical Gears
Modern Gears for the modern car

There is no longer any doubt as to the superiority of helical gears over spur gears for traction purposes, when properly used.

Two Nuttall Helicals in service in Washington, D. C., have already given more than 172,160 miles; a set used by the West Penn Railways has 500,000 miles to its credit, and numerous other large properties have reported equally favorable results. Noisy spur gears have ceased to be a necessary evil.

Nuttall BP Helical Gears wear longer and cost less in the long run, to say nothing of savings in maintaining electrical equipment through the elimination of gear vibration, and the public goodwill value of quiet, smooth-riding cars.

For the meshing of Nuttall Helical Gears, at any speed, is like the turning of a screw,— smooth, practically silent, shockless! There is no grinding and no chattering.

The secret lies in the 7½° Helix Angle, the long and short addendum tooth, and the Nuttall BP Heat Treating Process. The results have more than justified the years of research which Nuttall engineers have spent on the perfection of this modern gearing for electric traction.

We will be glad to cooperate in practical tests on your own property.

Nuttall

dule" for 1925

Form 13-E Nuttall Trolley Bases

Nuttall

Trolley Bases, Harps, Wheels, Pantagraphs

Standard on up-to-date roads

Nuttall engineers have given particular attention to perfecting and rendering these vital parts more reliable in operation, less susceptible to wear, and less costly of maintenance.

Form 13-E Nuttall Trolley Base for instance, has among other distinctive features an exclusive roller-bearing swivel, so designed that oil leakage is impossible, while water and dust cannot enter.

Timken Roller Bearing Trolley Base U.S. No. 20 is equipped with these famous bearings in specially hardened race-ways to meet trolley operating conditions.

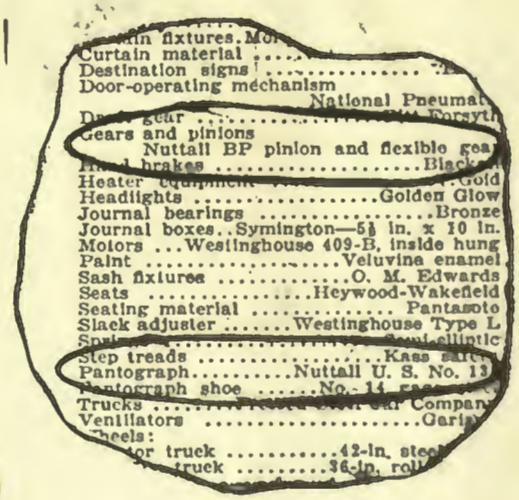
Nuttall Harps, Wheels and Pantagraphs are all equally good in design and construction.

Write for Bulletins giving full details

R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

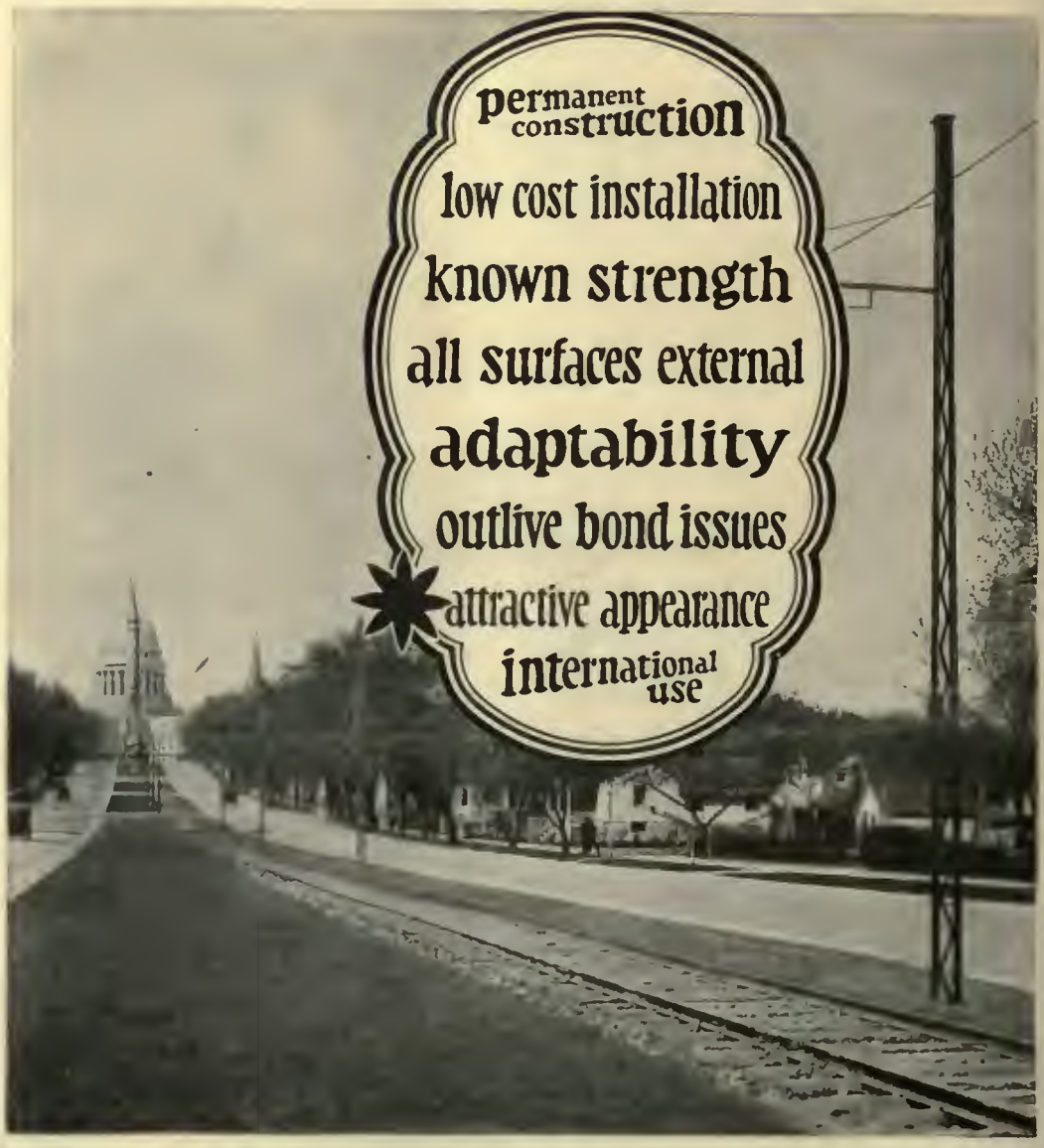
All Westinghouse Electric & Mfg. Co. District Offices are Sales Representatives in the United States for the Nuttall Electric Railway and Mine Haulage Products. In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto.

Nuttall Specifications on the new cars for the New York, Westchester & Boston Ry. Co.



MEMBER AERA

Nuttall



Attractive Appearance

The attractive and pleasing appearance of Bates poles is a decided factor in their preference for municipal use.

For instance — "We have received a number of compliments from people in the districts where the poles are in use as to the beauty of their appearance on the street, and have had requests from several other districts to rebuild their line with this kind of construction."

The rugged simplicity of Bates poles makes them particularly appropriate for use where public demand for beauty is a factor. Bates engineers will be glad to figure at your request on your requirements.

B-E-S-T Bates Expanded Steel Truss Co.
Illinois Merchants Bank Bldg.
Chicago, Ill., U. S. A.

BATES ONE PIECE EXPANDED STEEL POLES

50 of these cars

Now being constructed for Chicago Surface Lines. Designed for One-man, Two-man or Two-car train units under the design and specifications of the Chicago Surface Lines.

Two-car train unit for Chicago Surface Lines

10 LIGHT WEIGHT NOISELESS CARS

now being constructed for Duluth, Minn., Stillwater, Minn., and Grand Rapids, Mich.

Completely equipped shops for building cars of your design and specifications.

LIGHT WEIGHT NOISELESS ONE-MAN TWO-MAN CAR

22,000 to 24,000 Pounds Complete, Length 36 ft., Seats 43

10% faster schedule speed, 40% saving in power compared with standard weight car

Light Weight Car on W. J. Smith Noiseless Light Weight Trucks equipped with Hyatt Roller Bearings and Concentric Clasp Axle Drum Brakes provides Faster Acceleration, Faster and More Coasting, Faster and More Comfortable Braking, resulting in Faster Schedules, with greatly reduced Power Consumption and Less Automobile Interference.

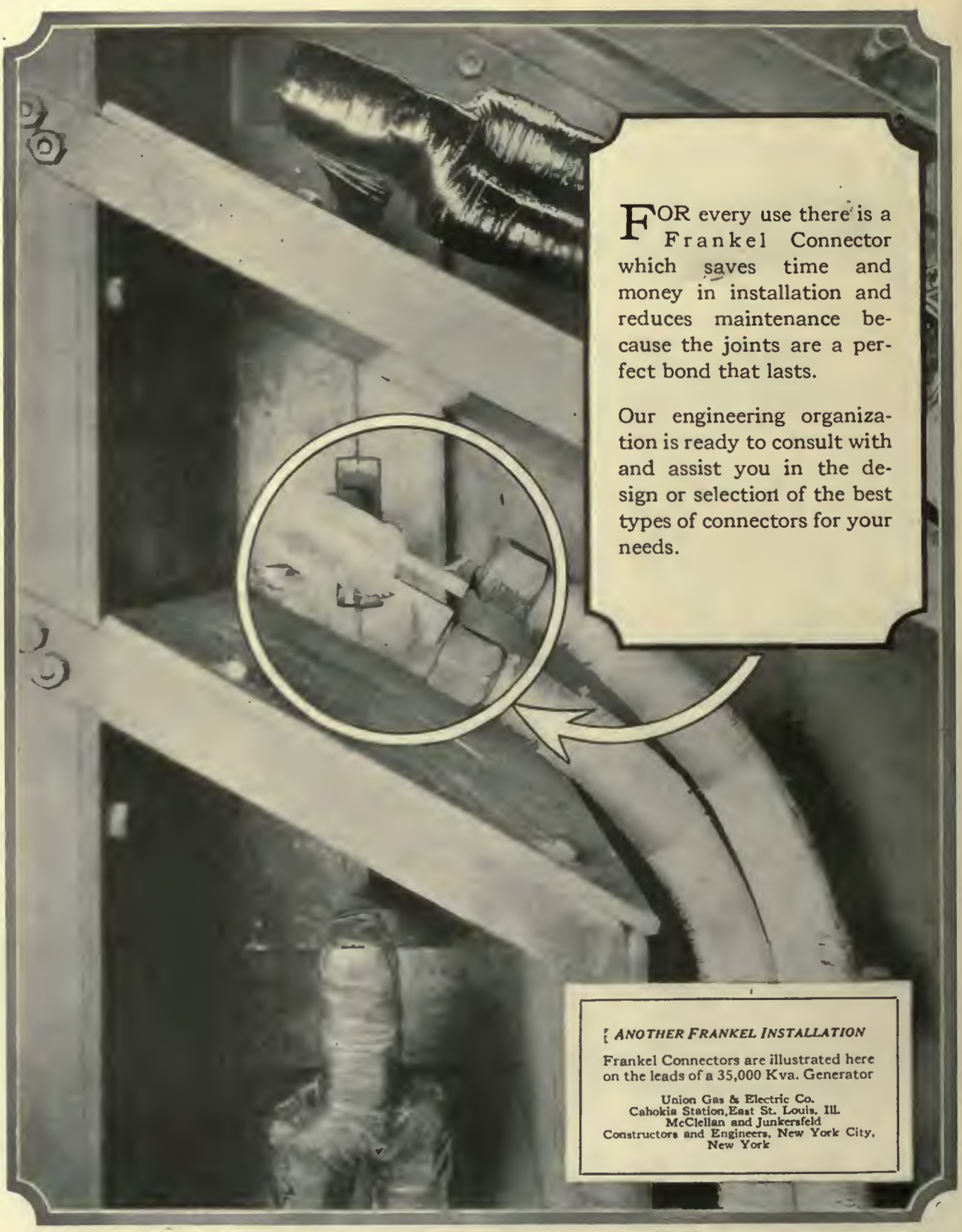
"Send Us Your Specifications"

Light Weight Noiseless Electric Street Car Company

1745 Illinois Merchants Bank Building, CHICAGO

Manufacturers of Electric Street Cars

Shops at St. Paul, Minn.



FRANKEL SOLDERLESS CONNECTORS

DISTRIBUTORS—*Sales Offices in all Principal Cities*

Westinghouse Elect. & Mfg. Co. ***Western Electric Company***

Do You Get All You Are Entitled to When You Purchase Ties?

SUCCESSFUL tie preservation demands a sound tie to start with. A decayed or unsound tie cannot give satisfactory service no matter how well it is treated.

The extreme care and personal supervision of ties immediately after they are cut is in large measure responsible for the soundness and longevity of ***International*** Ties.

To secure sound ties, they must be properly cut and properly followed from the tree to the treating yard. The important fact to be remembered is that they must be ***Removed Quickly from the Woods.***

This period in the production of ***International*** Ties is given particular attention for its execution has a direct bearing on the ultimate life of the tie.

International Ties are removed quickly from the decay producing conditions of the woods, transported to the right of way, inspected, graded and shipped to the seasoning yard, where they are free from all vegetation.

Here the ties are carefully stacked to allow maximum circulation of air and promote early seasoning with minimum danger of decay.

International Creosoting & Construction Co.

General Office—Galveston, Texas

Plants: Texarkana, Texas Beaumont, Texas
Galveston, Texas

2¢5

The International Dating Nail is our guarantee of quality and your protection

International

Standard Specification Ties

Modern Signal Protection

Electro-Pneumatic Interlocking at Terminal Station of Philadelphia & West Chester Traction Co.

At the new Philadelphia Terminal Station of the Philadelphia & West Chester Traction Co., UNION ELECTRO-PNEUMATIC INTERLOCKING allows car movements to be speeded up and insures against confliction of simultaneous movements.

Let one of our engineers study your operating conditions and co-operate with you in considering what Interlocking and Automatic Block Signals will do for your Railway.

Trade Mark

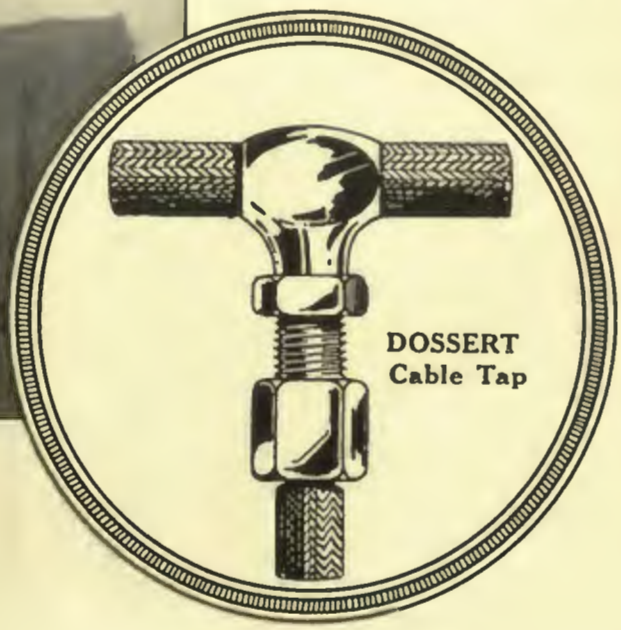
Union Switch & Signal Co.

SWISSVALE, PA.

Trade Mark

This tap off the main feeder

made with this DOSSERT in 5 minutes



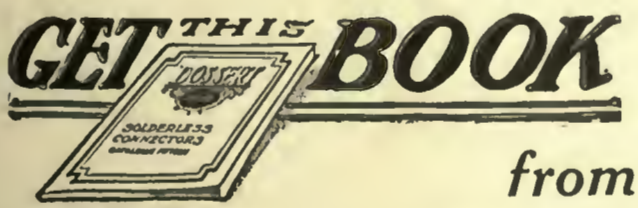
A man can waste a lot of time—and spoil a lot of insulation—by the old method of doing this job.

Now he goes up with a Dossert and a wrench—and does a perfect job, regardless of his experience, in a few minutes.

There are but few expert splicers in any construction or repair gang—but *every* man is expert on Dossert connections.

Tests after connection will show you that the Dosserts run at as low temperature as the wires connected to them.

You'll find many suggestions on time saving in the Dossert Book—which will be mailed you gratis on request.



FREE

from

DOSSERT & COMPANY

H. B. LOGAN, President

242 West 41st St., New York City


COLLIER

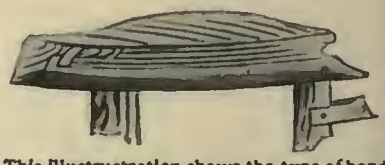
Superior Aerostructure Bodies Are 25% Lighter

The new Superior Bodies are a full 25% lighter and yet they are as rigid as any body. The same construction that results in this big reduction in weight at the same time adds greatly to strength.

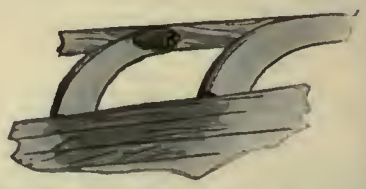
The weight reduction on these new Superior Bodies is equal to the weight of seven passengers. Yet the rigidity and strength are there. That means greater service and lower costs.

Many of the foremost chassis manufacturers have sent engineers to our plant to see these highly improved body manufacturing methods in practice. They have gone away thoroughly convinced of the marked advantages of Superior Aerostructure bodies.

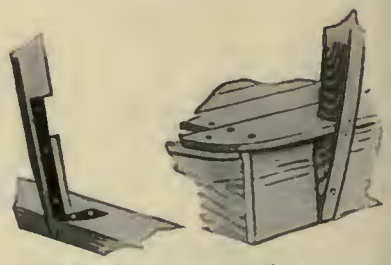
Write for full information or send an engineer to see Superior Aerostructure bodies in the making.



This illustration shows the type of bend used at all curves in every Superior body. All bends are made with laminated wood, creating a joint that in woodworking is the equivalent of a weld in metal working. These laminated bends are as strong as though the wood grew in that form for our convenience.



Above is shown the old style cross grain section that was formerly used. The lack of strength and clumsiness is evident. Note the irons for bracing. These are not needed with the new construction. This is one place where weight is saved.



Another big improvement in Superior Aerostructure bodies is the use of vertical sills. At the left is shown the old style construction. Note the weak way in which pillars are tied in and braced with heavy irons. At the right is shown the new vertical sill with firm anchorage for body pillars that makes bracing with irons unnecessary.

THE SUPERIOR MOTOR COACH BODY CO.

LIMA, OHIO

Aerostructure SUPERIOR BODIES *Coach Bodies*

Steel Pole Stability

Truscon Steel Poles are constructed throughout of copper bearing steel and in a truss formation which lends extraordinary strength and stability. The metal is concentrated at the corners in such a way as to adapt the structure especially to resist loads both longitudinally and transversely to the line. Interruption of service due to storms and other unusual stresses is reduced to a minimum possibility by the use of steel poles.

None of the ills that wood is heir to effects Truscon Steel Poles. They are fireproof and copper bearing steel construction insures extra long life and great durability. In appearance they are greatly superior and the surface does not deteriorate and become unsightly with age. Maintenance of steel poles is practically nothing and they are surprisingly low in first cost.

Return coupon for data on Truscon Steel Poles and Steel Windows.

TRUSCON STEEL COMPANY, Youngstown, Ohio

Warehouses and Sales Offices from Pacific to Atlantic.
For addresses see phone books of principal cities
Canada: Walkerville, Ont. Foreign Div.: New York

TRUSCON
COPPER-BEARING
STEEL POLES

TRUSCON Steel Windows conform to every structural and architectural demand for Powerhouses. Truscon Engineers are specialists in daylighting and control of natural ventilation in Powerhouses. Central Station Engineers everywhere are making use of this service in designing new Powerhouses.

TRUSCON STEEL COMPANY, Youngstown, Ohio
Please send me
Free booklet, "Truscon Steel Poles."
Information on Steel Windows for Powerhouses.

Name .....

Address .....

R. R. J. 1-3-25

Why are you buying new

YOU may be opening new routes—buying more coaches to handle increased traffic—replacing worn-out or obsolete equipment.

Whatever the reason that necessitates this expenditure of money, whether the amount is large or small, you cannot be certain that you have made the wisest purchase for your company until you have thoroughly investigated SAFEWAY Six Wheel Construction.

No matter how much experience you have had in the operation of buses, the time you devote to this investigation will be profitably spent. This is true because there is no four wheel vehicle whose performance can be compared with the Six Wheeler.

SAFEWAY Six Wheel transportation represents a form of bus operation which is superior to anything that can be accomplished with four wheel equipment. Before you complete any plans for the purchase of new buses you should understand the sound engineering principles on which Six Wheel construction is based and the resulting advantages both to passenger and operator.

Until you have actually ridden in a Six Wheeler you cannot realize how comfortably a large number of people can be carried over all sorts of roads.

Catalog and other information will be mailed on request

THE SAFEWAY

Made by The Six Wheel Company

equipment this year?

Until you have seen how Six Wheel construction absorbs road shocks and vibrations, you cannot appreciate the extent to which it minimizes body depreciation.

You need to drive this coach, or see it driven, to understand why the Six Wheeler, with its six point road contact and great braking area, cannot be equaled for safe operation. This is especially true on icy streets and hilly, snow-covered roads.

These are "high spots"—advantages in SAFEWAY construction that are evident in a single ride. Continued operation reveals many others, less obvious but equally important in the insurance of efficiency and profit in bus operation.

Finally, there is this to consider. Whether you spend ten or a hundred thousand dollars in 1925 for new equipment, your supreme desire must be for coaches that in the coming years will not have depreciated through wear or obsolescence . . . . . We believe you cannot be certain of this if you buy four wheel equipment . . . . . We know that on both these counts money spent for SAFEWAY Coaches in 1925 will continue to be a profitable and satisfactory investment for many years.

Catalog and other information will be mailed on request

SIX-WHEELER

1800 W. Lehigh Avenue, Philadelphia, Pa.

More trips—more *passengers* *more* profits every day

Electric railways are turning to modern, luxurious Pierce-Arrow motor coaches as an *additional* source of profit.

The public today demands speed, comfort and safety. Pierce-Arrow coaches are powered by six-cylinder engines. Speeds from 45 to 50 miles per hour can be maintained *with safety*. The luxuriousness of the roomy, solidly built bodies can be compared to that of a parlor car.

These modern coaches meet modern demands. They handle with the ease of high-powered touring cars. They glide along swiftly and silently with the smoothness of a Pierce-Arrow limousine. Vibration is noticeably absent.

* * *

Our engineers will be glad to demonstrate these modern coaches to railway representatives and to discuss their profit-earning ability.

THE PIERCE-ARROW MOTOR CAR COMPANY, *Buffalo, N.Y.*

Pierce Arrow

SIX-CYLINDER MOTOR COACHES

Standard Chassis **$4600**

Terms if desired

for 196-inch wheelbase, $4750 for 220-inch wheelbase, at Buffalo; including starter, battery, generator, solid tires and electric lights. Pneumatic tires and disc wheels optional at extra cost. Either chassis will accommodate the Sedan, sight-seeing or pay-enter types of wood or steel bodies, ranging from 18-passenger capacity upward.

."Tiger" Bronze Axle and Armature Bearings.

The exceptional toughness and anti-frictional qualities of "Tiger" Bronze insures great strength and a very slow and even rate of wear. These qualities result in a perfect bearing alignment and greater mileage. "Tiger" Bronze will save its cost many times over, every year.

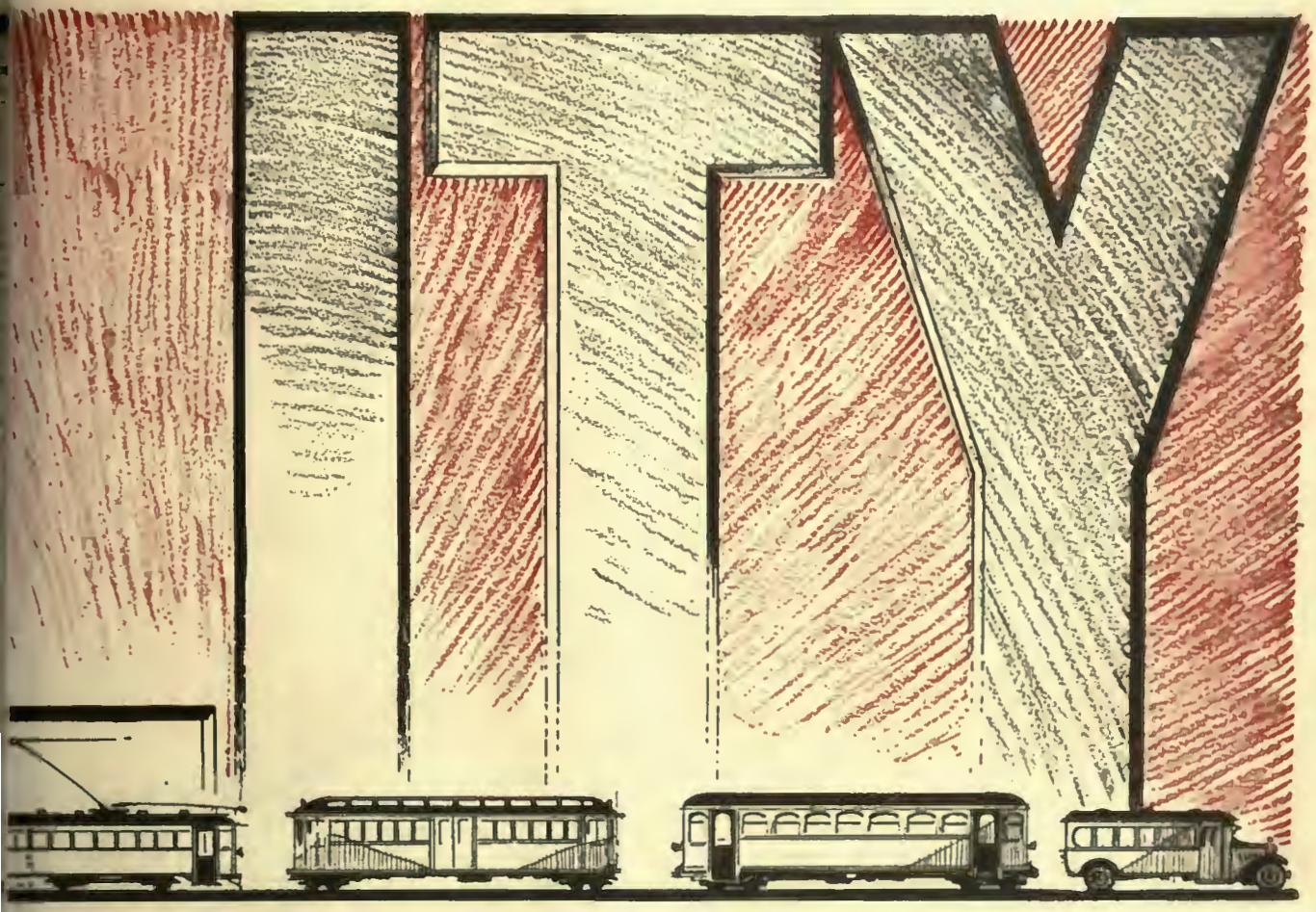
M-J Armature Babbitt

More-Jones experts, with 50 years of experience to guide them, compounded this excellent babbitt for the railway field exclusively. It is pure tin, copper, antimony and metallic nickel, alloyed to the highest degree of practical utility—there is not a trace of lead in it. Specify M-J for armature bearing service.

M-J Lubricated and V-K Oilless Trolley Wheels and Non-Arcing Harps.

Perfect lubrication plus maximum conductivity. That's the combination that makes V-K Oilless Trolley Wheels lowest in ultimate cost and higher in net efficiency. It's properly balanced and mechanically perfect in finish. The metal from which it is made is especially tough, yet not too hard. This means greater mileage. The patented oilless graphite and bronze gauze bushing is non-insulating, heat proof, long lived and easily interchangeable.

Let us give you further information and prices on More-Jones Quality Products. Prompt shipments always. Complete cooperation.



Backed up by Quality for 36 years

Thirty-six years of constant "quality" building has definitely established the reputation of St. Louis Cars and Equipment, for low maintenance costs.

Our long experience, our engineering data and our manufacturing resources are always at the call of railway operators.

St. Louis Car Company

St. Louis, Mo.

"The Birthplace of the Safety Car"

St. Louis Quality Equipment

When Concrete is Use

a Tie Should Do MORE Than Just Support the Rails

A TIE that does no more than just support the rails does not measure up to what a real tie should be.

1st. It should not displace any more concrete than is necessary.

2nd. It should be so constructed that it will protect the concrete, and preserve it against disintegration.

DAYTON

or Track Foundation

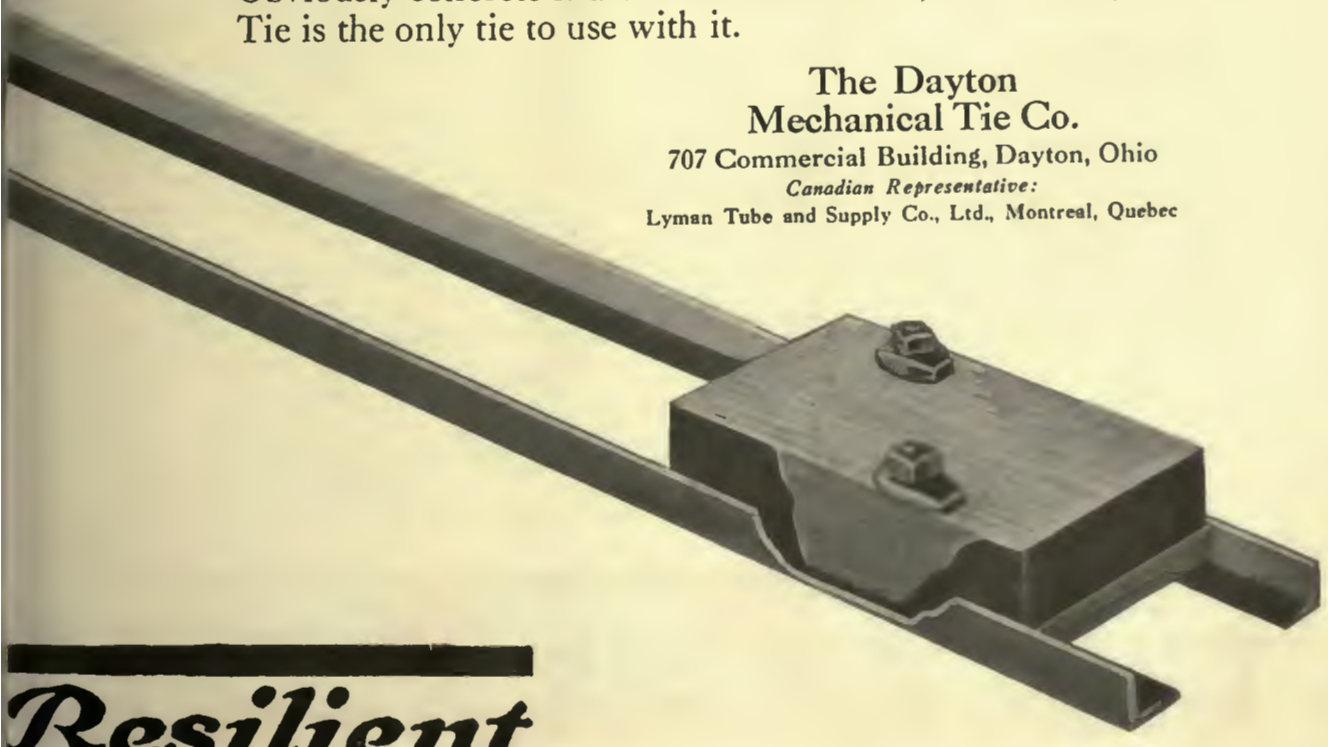
The increased weight of trucks over streets necessitates a paving foundation that will withstand this concentrated weight.

The wood tie on ballast necessarily displaces a certain amount of concrete, leaving only a thin coating of concrete above the tie. This coating gives way, and allows water to reach the ballast foundation, which soon buries itself in the subsoil, causing a sinking of the track, and a breaking of the paving.

The Dayton Tie is designed to overcome these weak places, by maintaining a uniform thickness of concrete throughout, besides reinforcing the concrete itself with the steel angles. To secure the maximum service from concrete it should not be permitted to disintegrate under the shocks of traffic. It will go to pieces if nothing is done to absorb the shocks. The tie itself should contain the cushion. This the Dayton Tie does. Resiliency is its fundamental principle.

Obviously concrete is the foundation to use, and the Dayton Tie is the only tie to use with it.

The Dayton Mechanical Tie Co.
707 Commercial Building, Dayton, Ohio
Canadian Representative:
Lyman Tube and Supply Co., Ltd., Montreal, Quebec



Resilient TIE

Cushions the Shock
On Rolling Stock

Made Right

Excellence of White Trucks begins with the purchase of materials. Tons upon tons are received every day at the factory, but not a bar or a sheet or a casting is permitted to go into production until it has been thoroughly tested by metallurgists and engineers to be sure that it measures up to the stringent specifications. Nothing is taken for granted.

Accepted material is placed in the hands of skilled, careful workmen with whom White excellence is a sacred tradition. An engineering department of trained and practical men sets the standards to which these men work.

Men, machines and materials are brought together in one great, co-ordinated system for smooth, careful, economical production.

Sold Right

There are rules of business more modern, perhaps, but none more sound than this creed: "Build the best product you can. Add to your cost a fair profit. Your purchaser's satisfaction will be complete and enduring." That policy has always been fundamental with The White Company. White Trucks are not manufactured to a price. They are sold for what it costs to build them, plus a fair profit. There are no trading allowances, no trick discounts, no considerations other than the basic, time-tested principle of sound merchandising—an honest dollar's worth for every dollar accepted from a customer. White prices have never been subject to frequent or wide variation.

The White Company will not knowingly sell you more trucks than you can use economically, or a truck of the wrong capacity for a job. No White sale—whether it is a single truck or a fleet—is complete until the purchaser's satisfaction is complete.

Kept Right

Direct factory branches in all of the principal cities and dealers at other points make certain that every White Truck is kept right.

The White Company has spread the boundaries of its factory yard throughout the world to be sure every White Truck may do its full duty. No White Truck is ever far from skilled and interested care. The needs of the oldest White Trucks can still be cared for should misfortunes of the road stop their wheels.

Making trucks right and selling trucks right has enabled The White Company to build up the organization which is the purchaser's assurance that White Trucks will be kept right.

White Service
Assuring continuous, sustained transportation everywhere.

A White combination tower and line construction truck in the service of the United Electric Railways, Baltimore

White Trucks are built to build business

White Trucks are business builders. Because of their ability to build business for their owners, they have built a great business for their makers. They have done both because they are made right, sold right and kept right.

Repeat orders daily emphasize the satisfaction of White owners. In the service of electric railway, power and light companies there are over 1550 White Trucks in fleets of two or more, exclusive of hundreds of single truck installations.

In addition to the large number of White Trucks owned by electric railways, 37 electric lines operate 783 White Busses in fleets ranging from five to 126. Scores of other White Busses profitably serve electric railways in fleets of less than five.

These owners know truck and bus values. They know their White Trucks and White Busses give the most *money-earning miles.*

THE WHITE COMPANY
CLEVELAND

WHITE TRUCKS

LUMNITE CEMENT

Speeds Concrete Construction in Cold Weather

Intersection where North Shore Road crosses Revere Street, city of Revere, Mass. The city allowed only 24 hours' closing of the section. On an area of about 1000 yards, using Lumnite Cement, 1: 2: 4 mix, 7" reinforced concrete was laid in November and put in service to heaviest traffic in 24 hours. The other part of the section previously laid, but not with Lumnite Cement, took more than three weeks to cure. Mr. Joseph Tomasello, the contractor, stated that the use of Lumnite not only avoided interruption to traffic, but also permitted completing a job in cold weather impossible with other cement.

SPEEDY elimination of traffic jams and detours, due to street or road construction and repairs, is made possible with Atlas Lumnite Cement all the year around.

LUMNITE is a hydraulic building cement. It produces *twenty-eight-day concrete in twenty-four hours* without the use of artificial accelerators. It is not "quick setting," but allows the normal time for mixing and placing in forms. Its high early strength is obtained through Bauxite, a high-grade aluminum ore, which is its principal ingredient. Within twenty-four hours, concrete pavement of Lumnite Cement sustains the heaviest traffic.

Also, concrete made with LUMNITE is doubly safeguarded against frost attack, because it hardens in a few hours to a point in its curing beyond danger of freezing, and this rapid hardening, a chemical action, develops very considerable heat within the mass.

LUMNITE is indispensable for repairing city streets and highways where traffic is constantly congested, and for all other concrete work where speed is essential.

THE ATLAS LUMNITE CEMENT CO.

25 *Broadway*, NEW YORK CITY

2000 First Avenue, Birmingham, Ala. 134 South LaSalle Street, Chicago

THE ATLAS LUMNITE CEMENT COMPANY — ATLAS LUMNITE CEMENT — NEW YORK, N.Y.

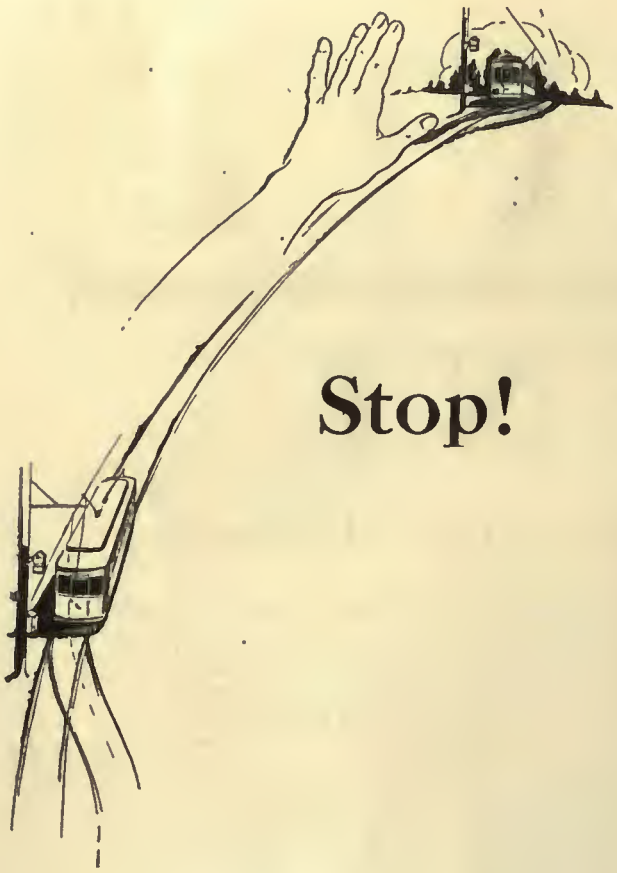
J.E.R.R.V.

SEND THIS COUPON TODAY

Please send your booklet on Lumnite, also detailed information on Lumnite's use for_____

*Name*_____

*Address*_____



Stop!

Nachod Says:
"Wait at this Siding"

No danger of a car running past a siding and meeting another when your line is equipped with NACHOD Automatic Signals. The "long arm of warning" reaches out and holds one at the siding while the other runs the single track.

The Nachod Signal never forgets, never sleeps, never relaxes its vigilance. N-A-C-H-O-D "spells safety" to the entire system.

No other current is needed except that already in your trolley system. There is nothing about Nachod Signals to get out of order to interfere with the reliability of their service. They are easy to install and maintain. No tearing up of track or rebonding—no insulated joints. Brilliant day and night signals—separate and independent.

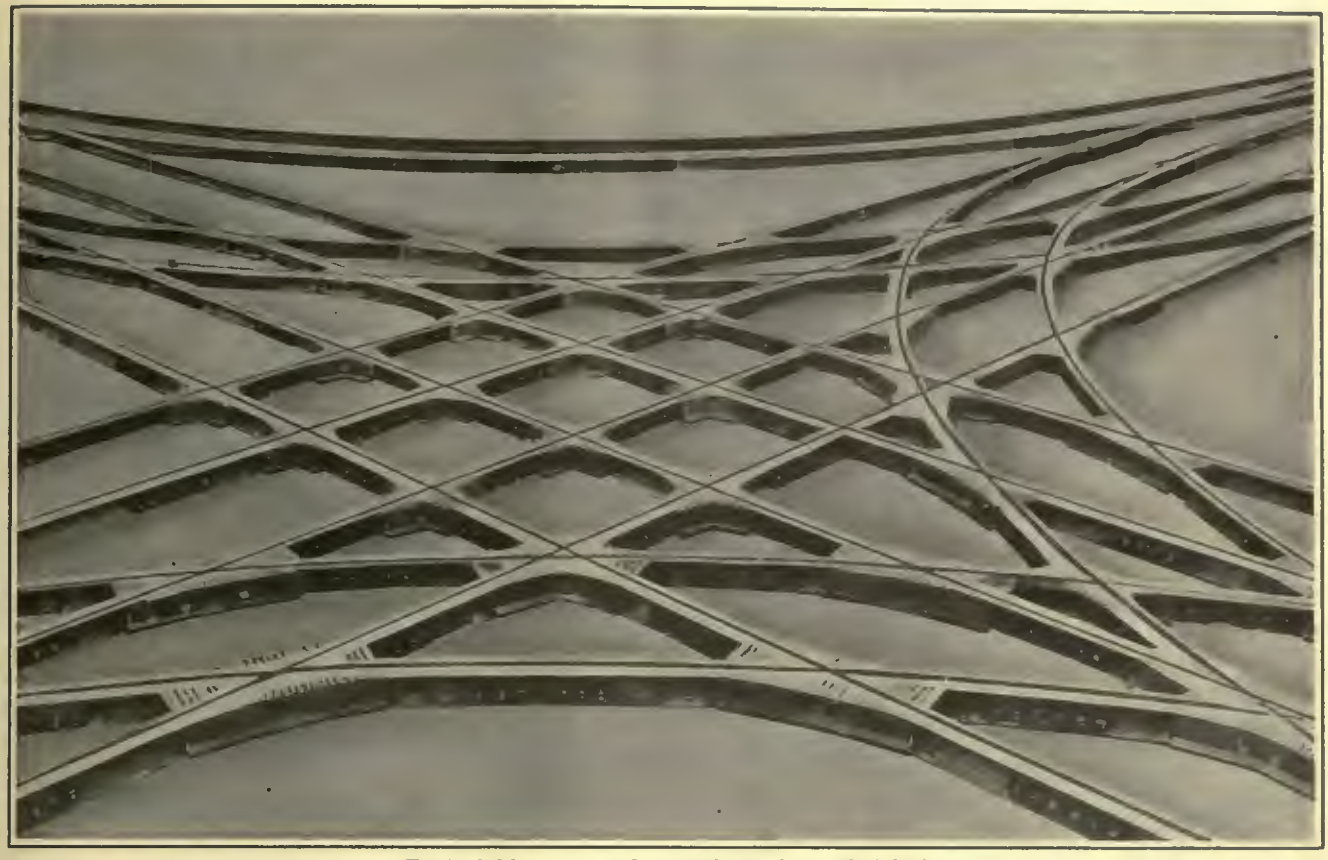
Over 125 electric railways in America and foreign countries use Nachod Signals.

Our Catalog No. 719 gives complete information on block signals. Also manufacturers of Highway Crossing Signals, Headway Recorders, Flasher Relays for trolley lines.

Write for it.

Nachod Signal Co., Inc.
Louisville, Kentucky

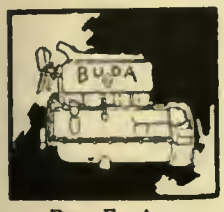
NACHOD



Typical Manganese Center Special Track Work

Unusual in Quality and Performance

BUDA



Bus Engines

Track and Bonding Drill

Crossing Gates

Track work for every condition of service, in standard layouts or complicated special work, when it bears the Buda mark, can be relied upon to render entire satisfaction. In many American Cities are examples of Buda track work that are demonstrating the long life characteristics built into every Buda product.

The high standard of Buda tools and accessories and Buda engines for motor buses and trucks is the result of 43 years of experience. Write Buda for literature on every phase of track construction and maintenance.

BUDA
ESTABLISHED
1881

Track Jack

Railroad Crossing

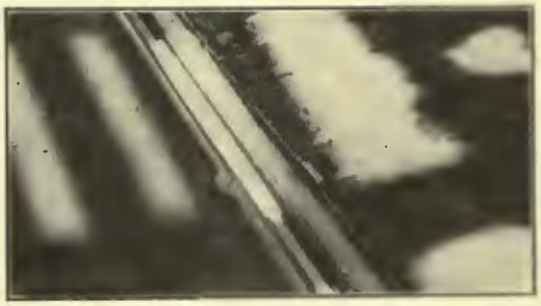
Hand-Car

THE BUDA COMPANY

Harvey (Chicago Suburb) Illinois

More Railway Properties Used The Thermit Rail Weld In 1924 Than In Any Previous Year

Our list of satisfied customers has always shown a constant and increasing growth but in 1924 the increase broke all records. Our old customers keep on using the process because they know from experience that it is unquestionably the best and most economical way to eliminate rail joints with their cost of maintenance. Other roads take it up because they desire to profit by the experience of those who are best qualified to know. They have been particularly impressed by the fact that the first Thermit Insert Rail Welds made over 12 years ago are still as good as ever. These welded joints have not cupped or pounded and practically none have broken. **We feel safe in claiming that no other method of welding rails can show such a record involving such a large number of welds over such a long period of time and under such heavy traffic.**



One of many Thermit Rail Welds which has been in place under heavy traffic on Third Avenue, New York City, for over eleven years.

If in 1925 you desire to secure the most from your construction and maintenance appropriation, you will plan to use the Thermit Weld. It assures economy, permanence, and flexibility. The equipment is low in first cost and is useful for many purposes besides welding rail joints. We shall be glad to demonstrate this to your satisfaction, and to quote you on your contemplated track work for 1925.

A Thermit Rail Weld made over five years ago in Grand Street, Jersey City, N. J., and still as good as new.

Metal & Thermit Corporation

120 Broadway, New York

Pittsburgh Chicago Boston S. San Francisco Toronto

for Electric Railways

ROLLED STEEL CAR WHEELS AND AXLES

Cambria Car Wheels are made by a combination rolling and forging process which thoroughly works the steel and gives exceptional refinement in structure. Cambria Car Wheels will give you the longest service at the lowest cost.

Cambria Axles for Street, Interurban, Subway and Elevated Cars, and Armature Shafts for electric service are furnished rough turned all over to meet any reasonable specification heat treated, annealed, or untreated.

Bethlehem Products for the Electric Railway Field include rails, spikes, trackwork, splice bars, bolts, tie plates, tie rods, pole line material, sheets, gear blanks, axles and rolled steel car wheels.

BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

Sales Offices:

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh
Buffalo Cleveland Detroit Cincinnati Chicago St. Louis San Francisco

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM

The FERALITE Process is making alumino thermic welding practical and popular

Key to the illustrations:

1. Aligning rail preparatory to welding—showing "undercut."
2. Next step—placing the moulds.
3. Preheating two joints simultaneously with our preheater.
4. Solid FERALITE joint after removing moulds.

THIS efficient process has met with an enthusiastic welcome from railway men all over the country for *several important reasons.*

First—We offer a simplified, rapid, and eminently satisfactory process. Everyone admits the superiority of alumino thermic welds which eliminate the joint entirely. Now the FERALITE process makes them practical.

Second—Our engineers are practical railway men, who know rail welding from A to Z.

Third—Our organization being young and vigorous is bent on giving every job the very best individual attention. We simply *have* to make each job another success, to add to the scores already achieved.

Fourth—We are making quotations today on alumino thermic welded joints which make them most attractive on any basis of comparison.

The FERALITE process requires no inserts. An absolutely homogeneous weld is secured by butting the rail heads, and this process, by fusing them together affords a solid weld of the original metal. Correct alignment is insured by this means, and grinding is practically eliminated.

With the FERALITE process is included all the necessary equipment and materials—preheaters, moulds, crucibles, welding portions, etc. Important improvements in all these items is one factor which has lowered the cost of alumino thermic welding by the FERALITE Process.

Get our figures for your 1925 welding program before you make your final plans.

ALUMINO-THERMIC FERALITE TRADE MARK WELDING MIXTURE

ALUMINO-THERMIC CORPORATION
ROSELLE PARK, N. J.

Turning to—

business.

New York Railways Awards Oil Contract

An important electric railway lubricating contract was closed Nov. 8 when the business of supplying oil for the entire lubricating requirements of the New York Railways was awarded to the Texas Company.

The New York Railways operates 1,593 motor passenger cars over 72.43 miles of route in Greater New York. The contract with the Texas Company does not include oil for use in power stations as the railway purchases its energy from the Interborough Rapid Transit Company. The contract became effective on Nov. 1.

Clipping from Electric Railway Journal, Nov. 15, 1924.

Brooklyn-Manhattan Transit!

Every car, from one man safety to ten car subway train of the vast B-M-T is now Texaco lubricated.

Boston Elevated Railway Company, too!

Here's a system operating thousands of surface cars, elevated lines and rapid transit subway service—Texaco Lubricated also.

New York Railways the latest!

The year 1924 has seen a number of the transportation companies turning to Texaco. There must be a *real reason,* when Texaco takes on the lubrication of the New York Railways.

TEXACO

THE TEXAS COMPANY, U. S. A.

Texaco Petroleum Products

Did you see this Armature at the AERA Convention?

Armature was never taken out of original case until sent to the A.E.R.A. Convention.

In continuous service four years and three months.

Mileage 206,170. Bearing Wear .0024 inch.

This armature was taken at random from a number of cars—not a picked armature.

This performance speaks for itself, and shows what can be done with

TULC LUBRICATION

TULC
A
LUBRICANT

You know the cost of rewinding armatures—the cost and replacement of bearings.

THE UNIVERSAL LUBRICATING CO
Schofield Building, CLEVELAND, OHIO
Jameson-Ross Co., Straus Building, Chicago

Forward—

to higher standards of electrical maintenance!

THIS is one place where every dollar spent returns in ten-fold savings. The quality of insulating materials, their dielectric strength and freedom from imperfections, influences directly the length of time your repair job will last.

Judge then of the possibilities of savings by the use of Irvington Insulating Materials. As one specific example, consider Irvington Black Varnished Cambric. It has 30% higher dielectric strength; 100% better heat resistance; 100% more alkali and acid resistance; 200% better aging qualities; 200% more resistance to oil than ordinary yellow varnished cambric.

All Irvington Products possess similar quality superiority.

IRVINGTON Products

Varnished Paper
Black and Yellow Varnished Cambric
Black and Yellow Varnished Silk
Irvington "Seamless Bias" Varnished Cambric Tapes
Flexible Varnished Tubing
"Cellulak"
Irvington Insulating Varnishes
"Irv-O-Slot" Armature Insulation

The World's Standard

IRVINGTON VARNISH & INSULATOR CO.
Irvington, New Jersey.
Established 1905

Sales Representatives:

Mitchell-Rand Mfg. Co., New York
T. C. White Electrical Supply Co., St. Louis
E. M. Wolcott, Rochester
Prehler Bros., Chicago
Consumers Rubber Co., Cleveland
Clapp & Lamoree, Los Angeles
F. G. Scofield, Toronto

Seven factors of Quality

High Dielectric Strength
High Resistance
Flexibility
Non Hygroscopic
Heat Resisting
Chemically Neutral
Maximum Elasticity

No. 208
"DELUXE"

No. 108
"DELUXE"

Develop Satisfied

DEVELOPING a satisfied consciousness is the best way of creating favorable public opinion and increasing the car riding habit.

Hale & Kilburn Seats because of their pleasing appearance and rare comfort have done much to develop a satisfied riding public.

Passengers appreciate comfortable well-upholstered seats. They speak well of the cars that are comfortable to ride in.

Hale and Kilburn SEATS

No. 300 A Standard Rattan Walkover Steel Seat

No. 300 A.E. Standard Interurban Steel Seat

a Consciousness

There is a Hale & Kilburn Seat in a style suitable for city cars—safety cars—interurban and motor buses. They will do much to build up good will, by developing a satisfied consciousness.

No. 208 DeLuxe Bus Seat. Last word in comfort and elegance. "Like riding in a private car."

No. 108 DeLuxe Bus Seat. Deep soft springs. Unusually fine for general service.

No. 300A. Standard Rattan Walkover street car seat.

No. 300 A. E. Elegant Interurban Walkover steel seat.

There are others. Send for Catalogue.

Hale-Kilburn Co. Sales Offices:

Hale-Kilburn Company,
30 Church St., New York

Hale-Kilburn Company,
1530-33 McCormick Bldg.,
Chicago, Ill.

E. A. Thornwell,
1513 Candler Bldg., Atlanta, Ga.

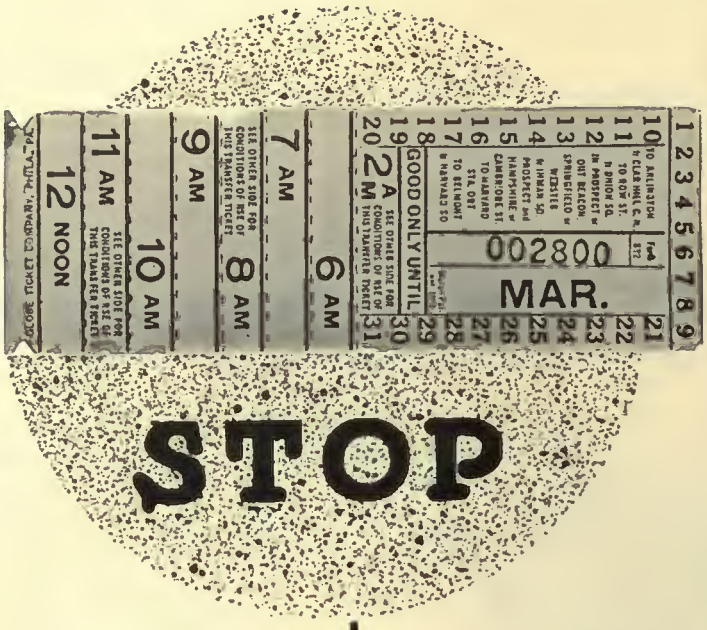
Equipment-Sales Corp'n,
Railway Exch. Bldg.,
St. Louis, Mo.

Frank F. Bodler,
903 Monadnock Bldg.,
San Francisco, Calif.

Chris Eccles,
320 S. San Pedro St.,
Los Angeles, Cal.

Harry M. Euler Company,
46 Front St., Portland, Ore.

T. C. Coleman & Son,
Starks Bldg., Louisville, Ky.



In 1925

Stop transfer abuses with

the Moran Patent Transfer

The latest improvement in transfer design, this Moran Patent Transfer *fixes* the time limit beyond dispute. Its validity is instantly apparent to the conductor — time-expired transfers are instantly detected. A.M. and P.M. indicated by contrasting colors, time limit controlled by tearing off the perforated coupons — conductors can issue this transfer with greatest rapidity.

Let us put you in touch with roads which have adopted the Moran Patent Transfer.

GLOBE

Tickets—Transfers—Passes

As specialists in this class of work, we can offer expert assistance and service in the designing of suitable tickets to meet the requirements of any special case.

Our extensive facilities and large production enable us to produce at lowest cost.

GLOBE TICKET COMPANY

116 N. 12th Street, Philadelphia, Pa.

Los Angeles New York San Francisco

Tune in on Station CCH

This is station CCH, the Consolidated Car Heating Company, broadcasting a short program to the electric railway industry, direct from its factory at Albany.

Modernized Door Engine Equipment—

RAILWAYS throughout the country who are equipping their cars with Consolidated Door Engines are getting the latest type construction in which are embodied many important safety features. Consolidated Door Engines are known for their smooth, safe and efficient operation. The cylinders are ground and polished to give longest life to piston leathers.

Doors operated by Consolidated Equipment are accident-proof. The passenger is protected in three ways—a soft, yielding cushion shoe on the door; a buffer spring in the door operating arm, and finally a by-pass in the door engine itself so that pressure cannot build up in the closing cylinder. The slightest bodily contact gently stops and holds the door.

When considering complete door operating equipment, think of Consolidated and weigh the many built-in points of advantage. Consolidated engineers are at your service.

Station CCH now signing off until next week, when it will resume broadcasting with another weekly message.

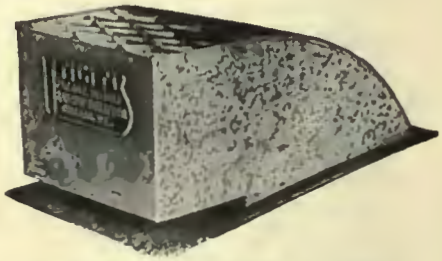
Good day!

CONSOLIDATED DOOR ENGINES

CONSOLIDATED CAR HEATING COMPANY

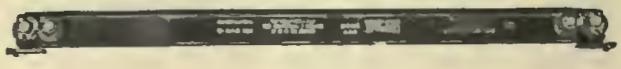
New York ALBANY, N. Y. Chicago

Utility New Type Heat Regulator No. 8. No relay. Greater uniformity of temperature, greater comfort, with 50% saving in current are assured by its use.



Utility Honeycomb Ventilators are constructed on the most scientific principle. Not only is the ventilation superior with this type of equipment, but a great saving of current for heating is also effected.

Left—Vestibule type Utility Heater. Below — Truss plank type Utility Heater. The "Chromalox" heating element of these heaters is constructed throughout of materials that resist deterioration from alternate heating and cooling. They meet every requirement of the Underwriters' Laboratories, whose approval they bear.



Individual Chromalox Strip Heater, the "active" part of Utility Heaters.

Sure, it'll be

What is Boyerizing?

Boyerizing does to car parts and brakes rigging what other processes attempted to do and failed. It gives a glossy, glass-hard armor coating to the metal which literally offers no foothold for wear.

And in cold, hard figures it means that Boyerized parts outlast ordinary steel parts not once or twice but three to four times.

If you don't believe us get a few Boyerized Brake Pins, for instance, and try them out.

The McArthur Turnbuckles

Requires only a small hand wrench to get a grip that "stays put." One full tooth exposed at the end on each section acts as a cutter in removing ice or caked mud.

SAMSON SPOT TROLLEY CORD

is tough and durable, made to withstand the powerful jerk on the cord when the pole goes off the wire. It outlasts ordinary trolley cords many times. It eliminates cord troubles, saves time and lowers costs.

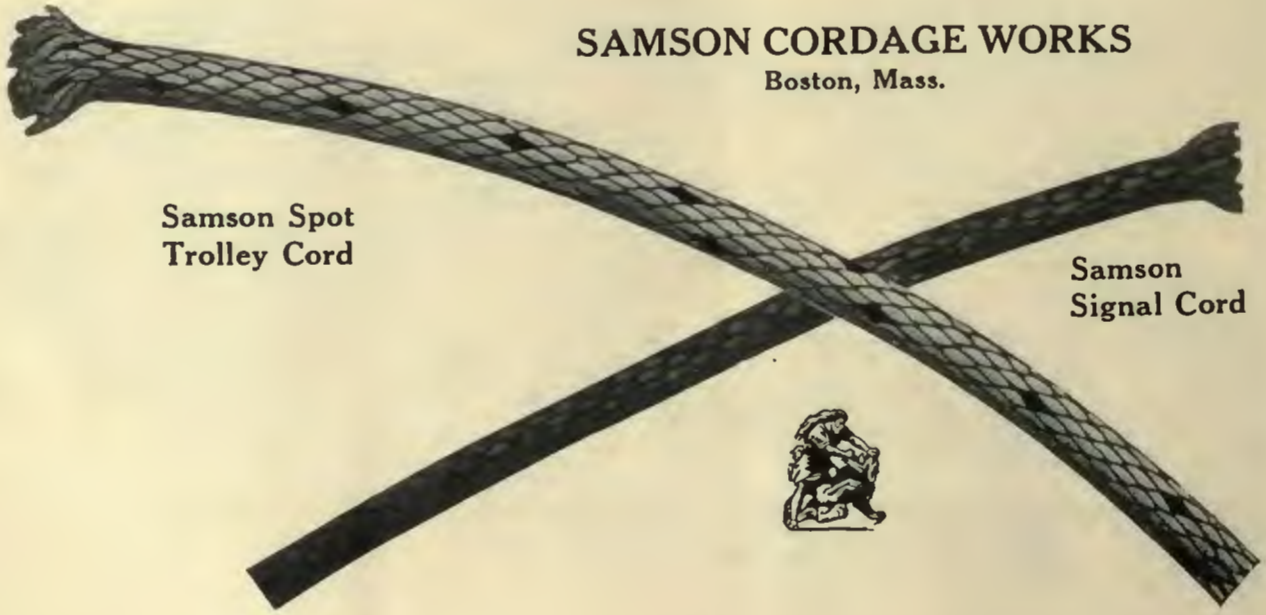
The value of Samson Spot Cord lies in the extra-quality stock from which it is made, its hard smooth braid and thorough waterproofing.

The colored spots are our trade mark and assure the buyer of a cord having unusual resistance to wear and weather.

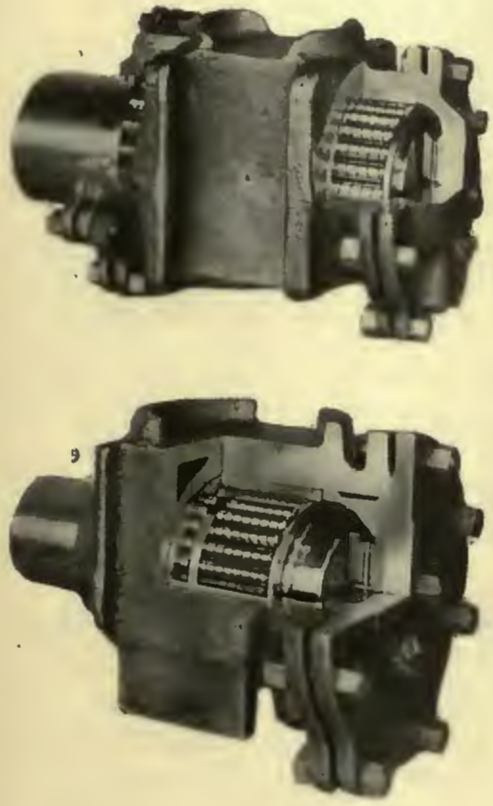
Samson Bell and Register Cord is the same extra quality as Samson Spot Trolley Cord. Made in drab, mahogany, and white, with wire centre if desired.

Send for Samples and Full Particulars

SAMSON CORDAGE WORKS
Boston, Mass.



Car Bearings Designed To Eliminate Needless Waste



Hyatt equipped journal boxes for electric railway cars, cut away to show the bearings.

THE greatest single cause of waste in street railway operation is the friction in car journal boxes.

Until recently this waste was considered unavoidable. Now, however, with the development of Hyatt railway bearings a definite means for its removal is at hand.

Hyatt bearings eliminate plain bearing friction and its attendant destructive wear, providing in its place the freely turning action of steel rollers. These rollers and the parts for retaining them are of sound construction and high grade materials, capable of meeting the severe requirements of railway service.

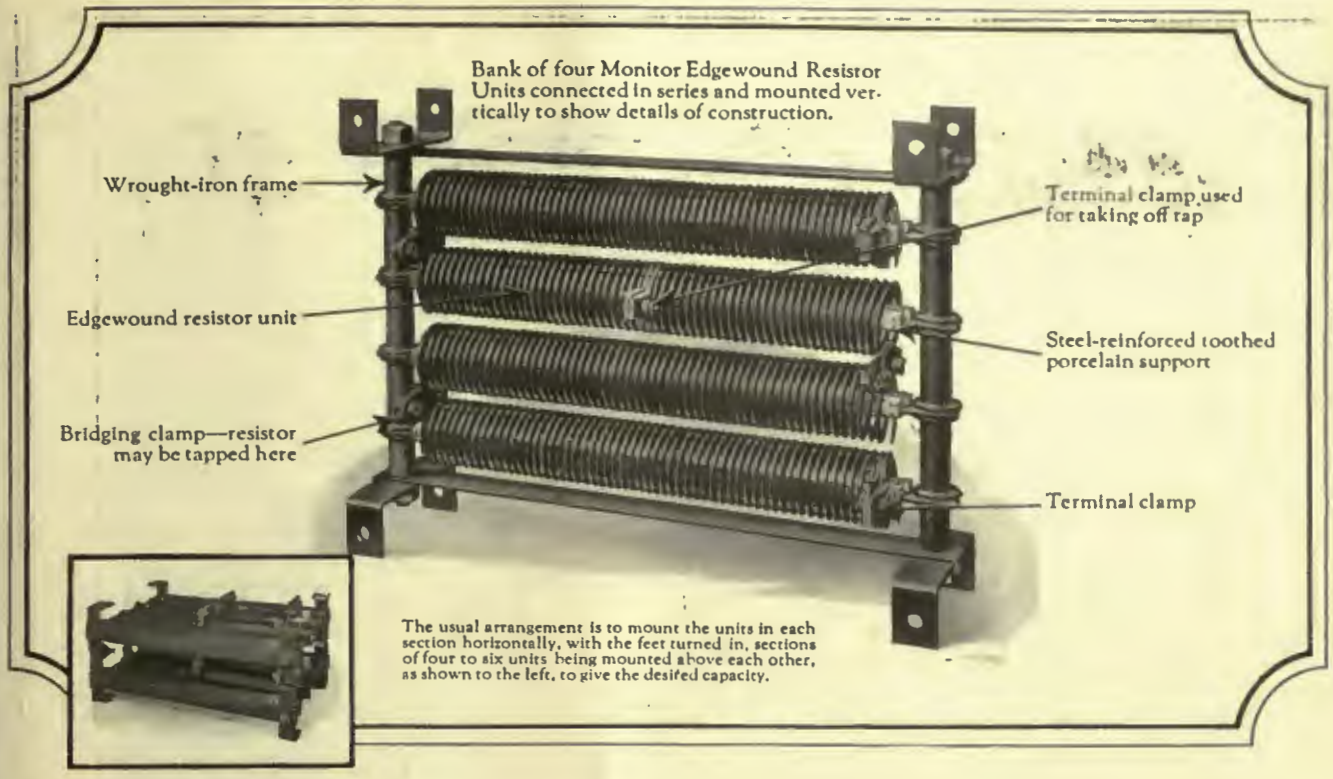
It is not difficult to see that the use of Hyatt bearings in journal boxes must result in power saving, lighter service for motors, lubrication economies, long bearing life and generally dependable car operation.

Several companies are now getting these results. That it is possible for *you* to get them will be demonstrated by our engineers, on request, without placing you under any obligation.

HYATT ROLLER BEARING COMPANY
NEWARK, NEW JERSEY

The Hyatt railway bearing—carries standard rated loads within standard truck dimensions.

HYATT ROLLER BEARINGS FOR ELECTRIC RAILWAY CARS



A *new* heavy-current resistor

Unbreakable — Compact — Light in Weight

THE insistent need for something better than cast-iron grids and equivalent forms of ribbon resistors led to the development of the Monitor Edgewound Resistor, which combines the best of each. Monitor Edgewound Resistors have the mechanical simplicity of the grid, the electrical characteristics of the ribbon and heat dissipating properties far greater than either.

Special alloy ribbon which is of uniform composition, moisture-proof, acid-resisting and of negligible temperature co-efficient of resistivity is wound on edge in helical form. Each unit is mounted on a steel re-inforced porcelain support which supports and separates every convolution at two diametrically opposite points. This method of construction permits free radiation and convection of heat and relieves the units from mechanical strain, enabling the resistor to be operated at any temperature up to red heat without sagging or injury.

Two simple forms of clamps provide facilities for connecting units in series or in parallel or for taking off taps at *any* desired points along the units.

The only joints are at the terminals of the sections whereas a cast-iron grid section has approximately 50 in addition to its terminals.

When rating the Monitor Edgewound Resistor at half the air temperatures permitted by the fire underwriters, the ratio of volume for a 4500-watt rheostat is 1 to 1.5 and the ratio of weight 1 to 1.65 when compared to an equivalent cast-iron grid resistor.

The Original "Just Press a Button" System

Complete information about this new resistor is given in Bulletin 107, which will be sent to you on request.

Monitor Controller Company, *500 E. Lombard St., Baltimore, Md.*

Birmingham	Buffalo	Cincinnati	Detroit	New York	Pittsburgh
Boston	Chicago	Cleveland	New Orleans	Philadelphia	St. Louis

6710-1

Monitor Edgewound Resistor

Chilled Iron Wheels

possess the required factors of safety at the lowest cost.

The hard wearing surface of the tread has sufficient bearing power to carry the maximum load of any car yet designed without permanent deformation, and has the maximum resistance to abrasion.

The hard tread and flange have a maximum wearing value.

The wearing surface of the tread and flange causes the least abrasion to the rail and offers the least resistance to rolling. There is a consequent saving in rail replacement cost and fuel consumption.

The metal of the tread produces the greatest co-efficient of brake shoe friction, yet removes the least quantity of brake shoe metal. Braking efficiency insured with decrease in brake shoe consumption over other types of wheels.

They carry a service guarantee.

Cost Less Per Car Mile

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS

1847 McCormick Building
CHICAGO

50 PLANTS ~ DAILY CAPACITIES 20000 WHEELS

Street Cars—Trucks—Bus Bodies Snow Fighting Equipment

McGuire-Cummings Mfg. Co. builds city and interurban cars and trucks, safety cars, combination and work cars, snow-plows, sweepers, bus bodies and electric locomotives.

Back of all equipment built by McGuire-Cummings are the results of over twenty years of specialization in the construction of all classes of rolling stock for the successful operation of electric railways.

The McGuire-Cummings engineering department is at the service of transportation companies considering the matter of new equipment. They will be pleased to submit specifications and drawings and to quote thereon or submit proposals on specifications furnished.

McGUIRE-CUMMINGS MANUFACTURING CO.,
General Offices: 111 W. Monroe St., Chicago, Ill.

SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD.

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.

Positions Vacant and all other classifications, 5 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION.

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH

1 to 3 inches . . . $1 50 an inch
4 to 7 inches . . . 4 30 an inch
8 to 11 inches . . . 4 10 an inch

Rates for larger spaces, per year, on request.

An advertising inch is measured vertically on one column, 3 columns 10 inches to a page.

R. F. J.

POSITIONS WANTED

AUDITOR, broad and thorough experience in financing and accounting; all branches railway, electric and gas utilities, open for engagement. Possess initiative and capable of assuming full control of all accounting matters. PW-758, Electric Railway Journal, Old Colony Bldg., Chicago, Ill.

EXECUTIVE, nine years manager of local street railway system in industrial town seeks larger opportunity. Thirteen years' prior experience in engineering, transportation and executive departments of large trunk line railroad. Has given special study to analyzing transportation problems and operating costs. PW-761, Electric Railway Journal, Real Estate Trust Bldg., Philadelphia, Pa.

EXECUTIVE—Twelve years' experience in engineering and operation, city and interurban; first-class record and references. PW-757, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

EXECUTIVE. Urban and interurban. Wide successful experience in all departments of construction and operation. PW-740, Electric Railway Journal, Leader-News Bldg., Cleveland, Ohio.

GENERAL superintendent of one of the largest electric railway systems, interurban and city, desires a change. Has come up through the ranks. Knows both electric railway and bus business. Capable of handling combination property. Highest references furnished confidentially. Open to any stable proposition. Wide experience with men in all departments of the business. If interested please give me an interview. Address PW-764, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

GENERAL shop foreman, city or interurban, 18 years' successful experience in maintainance operation and general shop management. At present employed. Personal reasons for change. PW-767, Electric Railway Journal, Old Colony Bldg., Chicago, Ill.

GENERAL superintendent, chief engineer, or superintendent of equipment, technical graduate, eighteen years' experience on construction, operation, maintenance of power, shops, track, line buses. Highly successful in handling men and materials and producing results, fine references. Personal reasons for desiring change. PW-768, Electric Railway Journal, Old Colony Bldg., Chicago, Ill.

POSITION wanted by young man, thorough accountant, ten years' public utility experience middle west, six years as auditor, secretary and treasurer and assistant to manager; familiar with railway, bus, gas and electric departments. Now employed, but desire change. PW-766, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

WANTED: Position with street railway company by master mechanic, 18 years' experience. Best of references. PW-765, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

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 Circuit Breakers
Roller-Smith Co.

Air Receivers, Aftercoolers
Ingersoll-Rand Co.

Ammeters
Roller-Smith Co.
Weston Electrical Instrument Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch Stand
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Johnson & Co., J. E.
St. Louis Car Co.
Standard Steel Wks.
Taylor Elec. Truck Co.

Axles, Bus
Standard Steel Co.

Axles (Front & Rear) Motor Truck & Passenger Car
Timken-Detroit Axle Co.

Axle Straighteners
Columbia M. W. & M. I. Co.

Axles, Trailer & Motor Bus
Timken-Detroit Axle Co.

Axles, Car Wheel
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. E.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Babbitt Metal
Ajax Metal Co.

Babbitting Devices
Columbia Machine Wks.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co., The

Batteries, Dry
National Carbon Co.
Nichols-Lintern Co.

Bearings and Bearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Columbia Machine Wks.
General Electric Co.
More-Jones Brass & Metal Co.
Norma-Hoffman Corp.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller Side
Baldwin Locomotive Wks.
Norma-Hoffman Corp.
Stucki Co., A.

Bells and Gongs
Brill Co., The J. G.
Columbia Machine Wks.
Consolidated Car Heating Co.
Elec. Service Supplies Co.

Benders, Rail
Railway Track-work Co.

Bodies, Bus
Superior Motor Coach Body Co.
Auto Body Co.

Boilers
Babcock & Wilcox Co., The

Bond Testers
Amer. Steel & Wire Co.
Elec. Service Supplies Co.
Roller-Smith Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.

Bonds, Rail
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Westinghouse Elec. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Boxes, Switch
Johns-Pratt Co.

Brackets and Cross Arms (See also Poles, Ties, Posts etc.)
American Bridge Co.
Bates Expanded Steel Truss Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Nat'l Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Taylor Electric Truck Co.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Brill Co., The J. G.
Columbia Machine Wks.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Taylor Electric Truck Co.
Westinghouse Tr. Br. Co.

Brooms, Track, Steel or Rattan
Parson Co., J. W.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
Morganite Brush Co.
National Carbon Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite
Morganite Brush Co.
National Carbon Co.

Brush Holders
Anderson Mfg. Co., A. & J. M.
Columbia M. W. & M. I. Co.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Bulkheads
Haskelite Mfg. Co.

Bunkers, Coal
American Bridge Co.

Buses, Motor
Brill Co., The J. G.
International Harvester Co.
International Motor Co.
N. Y. Transportation Co.
Pierce-Arrow Motor Car Co.
St. Louis Car Co.
Six Wheel Co.
White Co.

Bushings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.
E. G. Long Co.

Cables
(See Wires and Cables)

Calculating Machines
W. A. Morschhauser

Cambric Tapes, Yellow & Black Varnish
Irvington Varnish & Ins. Co.

Cambric Yellow & Black Varnish
Mica Insulataor Co.

Carbon Brushes
(See Brushes, Carbon)

Car Flooring
Wheeling Corrugated Co.

Car Lighting Apparatus
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse Elec. & M. Co.

Car Steps, Safety
Irving Iron Wks.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Differential Steel Car Co., Inc.
McGuire-Cummings Mfg. Co.
St. Louis Car Co.

Cars, Gas Rail
St. Louis Car Co.

Cars, Passenger, Freight Express, etc.
American Car Co.
Brill Co., The J. G.
Kuhlman Car Co., G. C.
McGuire-Cummings Mfg. Co.
National Ry. Appliance Co.
St. Louis Car Co.
Thomas Car Wks., Perley A.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.
Transit Equipment Co.

Cars, Self-Propelled
General Electric Co.

Castings, Brass, Composition or Copper
Ajax Metal Co.
Anderson Mfg. Co., A. & J. M.
Columbia Machine Wks.
More-Jones Brass & Metal Co.

Castings, Funnel
Wharton, Jr. & Co., Inc., Wm.

Castings, Gray Iron and Steel
American Bridge Co.
Bemis Car Truck Co.
Columbia Machine Wks.
Standard Steel Wks.

Castings, Malleable and Brass
Amer. Brake Shoe & Fdry. Co.
Bemis Car Truck Co.
Columbia Machine Wks.

Catchers and Retrievers, Trolley
Earll, C. I.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Cement Products
Atlas Lumnite Co.

Change Carriers
Cleveland Fare Box Co.
Galef, J. L.

Circuit Breakers
General Electric Co.
Roller-Smith Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables
Anderson Mfg. Co., A. M. & J. M.
Dossert & Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
General Electric Co.
Hubbard & Co.
WestinghouseElec . & M. Co.

Cleaners and Scrapers, Track (See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
McGuire-Cummings Mfg. Co.
Ohio Brass Co.
Root Spring Scraper Co.

Cleaners and Sockets
General Electric Co.

Coal and Ash Handling (See Conveying and Hoisting Machinery)

Coils, Armature and Field
Columbia Machine Wks.
Economy Electric Devices Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coil Banding and Winding Machines
Columbia Machine Wks.
Electric Service Sup. Co.
Westinghouse Elec. & M. Co.

Coils, Choke and Kicking
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines
Cleveland Fare Box Co.
Galef, J. L.
International Register Co. The
Johnson Fare Box Co.

Coin Sorting Machines
Cleveland Fare Box Co.
Galef, J. L.

Coin Wrappers
Cleveland Fare Box Co.
Galef, J. L.

Commutator Slotters
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Elec'l Mfg. Co.
Columbia Machine Wks.
General Electric Co.
Westinghouse Elec. & M. Co.

Compressors, Air
Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.

Compressors, Air, Portable
Ingersoll-Rand Co.

Compressors, Gas
Ingersoll-Rand Co.

Concrete Flooring Surface
Irving Iron Works

Condensers
Allis-Chalmers Mfg. Co.
General Electric Co.
Ingersoll Rand Co.
Westinghouse Elec. & M. Co.

Condenser Papers
Irvington Varnish & Ins. Co.

Conduits, Underground
Std. Underground Cable Co.

Connectors, Solderless
Dossert & Co.
Frankel Connector Co.
Westinghouse Elec. & M. Co.

Connectors, Trailer Car
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
Allis-Chalmers Mfg. Co.
Columbia Machine Wks.
General Electric Co.
Westinghouse Elec. & M. Co.

Controller Regulators
Electric Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse Elec & M. Co.

Converters, Rotary
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Conveying and Hoisting Machinery
Columbia M. W. & M. I. Co.

Copper Wire
Anaconda Copper Mining Co.

Cord, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co., The
Roeblings Sons Co., John A.
Samson Cordage Works
Silver Lake Co.

Cord Connectors and Couplers
Electric Service Supplies Co.
Samson Cordage Work
Wood Co., Chas. N.

Couplers, Car
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes
Allis-Chalmers Mfg. Co.

Cross Arms (See Brackets)

Crossings
Ramapo Ajax Corp.

Crossing Foundations
International Steel Tie Co.

Crossing Frogs and Switches
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co., Inc.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.

Crossing Signals .See Signal Systems, Highway Crossing)

Crossings, Track, (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.

Crushers, Rock
Allis-Chalmers Mfg. Co.

Curtains and Curtain Fixtures
Brill Co., The J. G.
Electric Service Supplies Co.
Morton Mfg. Co.

Cutouts
Johns Pratt Co.

Dealers' Machinery
Electric Equipment Co.
Hyman-Michaels Co.
Transit Equipment Co.

Derailing Switches, Tee Rail
Ramapo Ajax Corp.

Destination Signs
Columbia Machine Wks.
Electric Service Supplies Co.

Detective Service
Wish Service, P. Edward

Door Operating Devices
Consolidated Car Heating Co.
National Pneu. Co, Inc.
Safety Car Devices Co.

Doors and Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.
St. Louis Car Co.

Doors, Folding Vestibule
National Pneumatic Co., Inc.

Draft Rigging, (See Couplers)

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.

Ears
Ohio Brass Co.

Economizers
Power Specialty Co.

Electric Grinders
Railway Track-work Co.

Electrodes, Carbon
Railway Track-work Co.

Ingersoll-Rand Paving Breakers tearing up track foundation operated from I-R Electric Driven Portable Air Compressor.

A dozen times faster

The Compressed Air Way Saves Time and Money

Ingersoll-Rand Portable Air Compressors and Tools finish up many jobs in a fraction of the time required by hand methods.

Pneumatic "Paving Breakers" save more than 50% in time and labor over hand methods, when breaking out pavement shoulders, heavy foundation, etc.

Pneumatic Tie Tampers enable four men to tamp more track and do it better than twelve to sixteen men using hand methods.

Other air tools are also used to save money on various jobs, making the portable compressor outfit a most important factor in reducing track costs. Ask for complete information on the savings made with portable air power units.

Ingersoll-Rand Company
11 Broadway, New York
Offices in the Principal Cities the World Over
For Canada, refer Canadian Ingersoll-Rand Co., Limited
260 St. James Street, Montreal, Quebec

Ingersoll-Rand

Electrodes, Steel
Railway Track-work Co.

Electrical Wires and Cables
American Elec. Works
Roeblings Sons Co., J. A.

Engineers, Consulting, Contracting and Operating
Allison & Co., J. E.
Archbold-Brady Co.
Beeler, John A.
Bibbins, J. Rowland
Buchanan & Layng
Bureau of Commercial Economics, Inc.
Day & Zimmerman, Inc.
Drum & Co., A. L.
Feustel, Robert M.
Ford, Bacon & Davis
Hemphill & Wells
Holst, Engelhardt W.
Jackson, Walter
Kelly, Cooke & Co.
Ong, Jee R.
Parsons, Klapp, Brinkerhoff & Douglas
Railway Audit & Inspection Co.
Richey, Albert S.
Dwight P. Robinson & Co.
Sanderson & Porter
Shaw, Henry M.
Stevens & Wood, Inc.
Stone & Webster

Engineers Inspecting & Chemists
Pittsburgh Testing Laboratory

Engines, Gas, Oil and Steam
Allis-Chalmers Mfg. Co.
Ingersoll-Rand Co.
Westinghouse Elec. & M. Co.

Expansion Joints, Track
Wharton, Jr., & Co., Inc., Wm.

Exterior Side Panels
Haskelite Mfg. Co.

Fare Boxes
Cleveland Fare Box Co.
Economy Elec. Devices Co.
Galef, J. L.
Nat'l Ry. Appliance Co.
Ohmer Fare Register Co.

Fences, Woven Wire and Fence Posts
Amer. Steel & Wire Co.

Fenders and Wheel Guards
Brill Co., The J. G.
Consolidated Car Fender Co
Electric Service Sup. Co.
Root Spring Scraper Co.
Star Brass Works

Fibre and Fibre Tubing
Westinghouse Elec. & M. Co

Field Coils (See Coils)

Flaxlinum Insulation
Nat'l Ry. Appliance Co.

Floodlights
Electric Service Sup. Co.

Floor Plates
American Abrasive Metals Co.

Flooring, Fireproof
Irving Iron Works

Flooring, Non-Slipping
Irving Iron Works

Flooring, Open Steel
Irving Iron Works

Flooring, Steel Subway
Irving Iron Works

Flooring, Ventilating
Irving Iron Works

Forgings
Carnegie Steel Co.
Columbia M. W. & M. I. Co.
Duff Mfg. Co.
Standard Steel Wks.

Frogs & Crossings, Tee Rail
Bethlehem Steel Co.
Ramapo Ajax Corp.

Frogs, Track. (See Track Work)

Frogs, Trolley
Ohio Brass Co.

Funnel Castings
Wm. Wharton Jr. & Co.

Furnaces, Electric
American Bridge Co.

Fuses and Fuse Boxes
Columbia Machine Wks.
Consolidated Car Heating Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Fuses, Refillable
General Electric Co.

Galvanizers, Hot Dip
Jos. P. Cattie & Bros.

Gaskets
Westinghouse Tr. Br. Co.

Gas-Electric Cars
General Electric Co.

Gasoline Torches
Economy Elec. Devices Co.

Gas Producers
Westinghouse Elec. & M. Co

Galvonometers
Weston Electrical Instrument Co.

Gates, Car
Brill Co., The J. G.

Gear Blanks
Bethlehem Steel Co.
Carnegie Steel Co.
Standard Steel Wks.

Gear Cases
Chillingworth Mfg. Co.
Columbia Machine Wks.
Electric Service Supplies Co.
Westinghouse Elec. & M. Co.

Gears and Pinions
Bemis Car Truck Co.
Bethlehem Steel Co.
Columbia Machine Wks.
Electric Service Supplies Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Tool Steel Gear & Pinion Co.

Generating Sets, Gas-Electric
General Electric Co.

Generators
Allis-Chalmers Mfg. Co.
English Electric Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Girder Rails
Bethlehem Steel Co.
Lorain Steel Co., The

Gongs (See Bells and Gongs)

Grating, Steel Subway
Irving Iron Works

Greases (See Lubricants)

Grinders and Grinding Supplies
Metal & Thermit Corp.
Railway Track-work Co.

Grinders, Portable
Railway Track-work Co.

Grinders, Portable Electric
Railway Track-work Co.

Grinding Blocks and Wheels
Railway Track-work Co.

Guard Rail Clamps
Ramapo Ajax Corp.

Guard Rails, Tee Rail & Manganese
Ramapo Ajax Corp.

Guards, Cattle
American Bridge Co.

Guards, Trolley
Electric Service Sup. Co.
Ohio Brass Co.

Hammers, Pneumatic
Ingersoll-Rand Co.

Harps, Trolley
Anderson M. Co., A. & J. M.
Electric Service Sup. Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.

Headlights
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.

Headlining
Haskelite Mfg. Co.
Panelyte Co.

Heaters, Car (Electric)
Consolidated Car Heating Co.
Gold Car Heating & Lighting Co.
Nat'l Ry. Appliance Co.
Smith Heater Co., Peter Wm.

Heaters, Car, Hot Air and Water
Electric Service Sup. Co.
Smith Heater Co., Peter Wm.

Heaters for Special Purposes
Power Specialty Co.

Helmets, Welding
Railway Track-work Co.

Hoists and Lifts
Columbia Machine Wks.

Hoists, Portable
Ingersoll-Rand Co.

Hose, Bridge
Ohio Brass Co.

Hydraulic Machinery
Allis-Chalmers Mfg. Co.

Indicating, Signals
Nichols-Lintern Co.

Inspecting Engineers & Chemists
Pittsburgh Testing Laboratory

Instruments, Measuring, Testing and Recording
Electric Service Sup. Co.
General Electric Co.
Roller-Smith Co.
Westinghouse Elec. & M. Co.
Weston Electrical Instrument Corp.

Insulating Cloth, Paper and Tape
Anchor Webbing Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Okonite Co.
Standard Underground Cable Co.
Westinghouse E. & M. Co

Insulating Machinery
Amer. Ins. Machinery Co.

Insulating Silk
Irvington Varnish & Ins. Co.

Insulating Varnishes
Irvington Varnish & Ins. Co.

Insulation (See also Paints)
Anderson M. Co., A. & J. M.
Electric Ry. Equipment Co.
Electric Service Sup. Co.
General Electric Co.
Irvington Varnish & Ins. Co.
Mica Insulator Co.
Okonite Co.
Westinghouse Elec. & M. Co.

Insulation Cloth Paper & Tape
Mitchell-Rand Co.
Mica Insulator Co.

Insulation, Slot
Irvington Varnish & Ins. Co.

Insulator Pins
Electric Service Sup. Co.
Hubbard & Co.

Insulators (See also Line Material)
Anderson M. Co., A. & J. M.
Electric Ry. Equipment Co.
Electric Service Sup. Co.
Hemingray Glass Co.
Irvington Varnish & Ins. Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Jacks (See also Hoists and Lifts)
Buda Company
Columbia Machine Wks.
Duff Mfg. Co.
Electric Service Sup. Co.
National Ry. Appliance Co.

Journal Boxes
Bemis Car Truck Co.
Brill Co., The J. G.

Junction Boxes
Standard Underground Cable Co.

Lamp Guards and Fixtures
Anderson M. Co., A. & J. M.
Electric Service Sup. Co.
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Arc and Incandescent (See also Headlights)
Anderson M. Co., A. & J. M.
General Electric Co.
Westinghouse E. & M. Co.

Lamps, Signal and Marker
Nichols-Lintern Co.

Lanterns, Classification
Nichols-Lintern Co.

Lightning Arresters
Shaw, Henry M.

Lightning Protection
Anderson M. Co., A. & J. M.
Electric Service Sup. Co.
General Electric Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Line Material (See also Brackets, Insulators, Wires, Etc.)
Anderson M. Co., A. & J. M.
Archbold-Brady Co.
Columbia M. W. & M. I. Co.
Dossert & Co.
Electric Ry. Equipment Co.
Electric Service Sup. Co.
English Electric Co.
General Electric Co.
Hubbard & Co.
More-Jones Brass & Metal Co.
Westinghouse Elec. & M. Co.

Locking Spring Boxes
Wm. Wharton Jr. & Co., Inc.

Locomotives, Electric
Baldwin Locomotive Wks.
General Electric Co.
Westinghouse Elec. & M. Co.

Locomotives, Oil Engine, Electric Driven
Ingersoll-Rand Co.

Lubricating Engineers
Galena-Signal Oil Co.
Texas Company
Universal Lubricating Co.

Lubricants, Oil and Grease
Galena Signal Oil Co.
Texas Company
Universal Lubricating Co.

Lumber (See Poles, Ties, etc.)

Machine Tools
Columbia M. W. & M. I. Co.

Manganese Parts
Bemis Car Truck Co.

Manganese Steel Castings
Wm. Wharton Jr. & Co., Inc.

Manganese Steel Guard Rails
Ramapo Ajax Corp.

Manganese Steel, Special Track Work
Bethlehem Steel Co.
Wm. Wharton Jr. & Co., Inc.

Manganese Steel Switches, Frogs and Crossings
Bethlehem Steel Co.
Ramapo Ajax Corp.

Meters (See Instruments)
Roller-Smith Co.

Meters, Car Watt-Hour
Economy Electric Devices Co.

Mica
Mica Insulator Co.

Motor and Generator Sets
General Electric Co.

Motor Buses (See Buses, Motor)

Motormen's Seats
Brill Co., The J. G.
Electric Service Sup. Co.
St. Louis Car Co.
Wood Co., Chas. N.

Motors, Electric
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Motor Leads
Dossert & Co.

Nuts and Bolts
Allis-Chalmers Mfg. Co.
Bemis Car Truck Co.
Bethlehem Steel Co.
Columbia M. W. & M. I. Co.
Hubbard & Co.

Ohmmeters
Roller-Smith Co.

Oil Heaters
Power Specialty Co.

Oil Purifiers
De Laval Separator Co.

Oils (See Lubricants)

Packing
Electric Service Sup. Co.
Westinghouse Tr. Br. Co.

Paints & Varnish Preservatives
Baldwin Locomotive Wks.
Joseph Dixon Crucible Co.

Paints and Varnishes for Woodwork
National Ry. Appliance Co.

Pavement Breakers
Ingersoll-Rand Co.

Paving Material
Amer. Br. Shoe & Fdry. Co.

Pickups, Trolley Wire
Electric Service Sup. Co.
Ohio Brass Co.

Pinion Pullers
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
General Electric Co.
Wood Co., Chas. N.

Pinions (See Gears)

Pins, Case Hardened, Wood and Iron
Bemis Car Truck Co.
Electric Service Sup. Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Pipe Fittings
Standard Steel Wks.

Planers (See Machine Tools)

Plates for Tee Rail Switches
Ramapo Ajax Corp.

Pliers, Rubber Insulated
Electric Service Sup. Co.

Pneumatic Tools and Accessories
Ingersoll-Rand Co.

Pole Line Hardware
Bethlehem Steel Co.
Ohio Brass Co.

Pole Reinforcing
Drew Elec. & Mfg. Co.
Hubbard & Co.

Poles and Ties, Treated
Bell Lumber Co.
Cook Pole & Tie Co.
International Creosoting & Construction Co.
Long Bell Lumber Co.

Poles, Metal Street
Bates Expanded Steel Truss Co.
Electric Ry. Equip. Co.
Hubbard & Co.

Poles, Ties, Posts, Piling and Lumber
Bell Lumber Co.
Cook Pole & Tie Co.
International Creosoting & Construction Co.
Long Bell Lumber Co.

Poles, Trolley
Anderson M. Co., A. & J. M.
Columbia M. W. & M. I. Co.
Nuttall Co., R. D.

Poles, Tubular Steel
Elec. Ry. Equip. Co.
Electric Service Sup. Co.

Portable Grinders
Buda Company

Potheads
Okonite Co.

Power Saving Devices
Nat'l Ry. Appliance Co.

Pressure Regulators
General Electric Co.
Westinghouse Elec. & M. Co.

Pumps
Allis-Chalmers Mfg. Co.
Ingersoll-Rand Co.

Pumps, Vacuum
Ingersoll-Rand Co.

Punches, Ticket
International Register Co., The
Wood Co., Chas. N

Rail Braces and Fastenings
Ramapo Ajax Corp.

Rail Joints
Carnegie Steel Co.
Rail Joint Co.

Rail Joints, Welded
Metal & Thermit Corp.

Rail Grinders (See Grinders)

Rails, Relaying
L. B. Foster Co.
Hyman-Michaels Co.

Rails, Steel
Carnegie Steel Co.
L. B. Foster Co.

Railway Safety Switches
Consolidated Car Heating Co.
Westinghouse Elec. & M. Co.

Railway Welding (See Welding Processes)

Rail Welding
Metal & Thermit Corp.

Rattan
Brill Co., The J. G.
Electric Service Sup. Co.
Hale-Kilburn Co.
St. Louis Car Co.

Registers and Fittings
Brill Co., The J. G.
Electric Service Sup. Co.
International Reg. Co., The
Ohmer Fare Register Co.
Rooke Automatic Reg. Co.

Reinforcement, Concrete
Amer. Steel & Wire Co.
Bethlehem Steel Co.
Carnegie Steel Co.

Repair Shop Appliances (See also Coil Banding and Winding Machines)
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.

Repair Work (See also Coils)
Columbia M. W. & M. I. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Replacers, Car
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.

Resistance, Grid
Columbia M. W. & M. I. Co.
Monitor Controller Co.

Resistance, Wire and Tube
General Electric Co.
Westinghouse Elec. & M. Co.

Resistances
Consolidated Car Heating Co.

Retrievers, Trolley (See Catchers and Retrievers, Trolley)

Rheostats
General Electric Co.
Monitor Controller Co.
Westinghouse Elec. & M. Co.

Rollers, Bearing
Hyatt Roller Bearing Co.

Roofs
Haskelite Mfg. Co.

Sanders, Track
Brill Co., The J. G.
Columbia M. W. & M. I. Co.
Electric Service Sup. Co.
Nichols-Lintern Co.
Ohio Brass Co.

Sash Fixtures, Car
Brill Co., The J. G.

Sash, Metal, Car Window
Hale-Kilburn Co.

Scrapers, Track (See Cleaners and Scrapers, Track)

Screw Drivers, Rubber Insulated
Electric Service Sup. Co.

Seating Materials
Brill Co., The J. G.

Seats, Bus
Hale-Kilburn Co.
Heywood-Wakefield Co.
St. Louis Car Co.

Seats, Car (See also Rattan)
Brill Co., The J. G.
Hale-Kilburn Co.
St. Louis Car Co.

Second-Hand Equipment
Electric Equipment Co.
Hyman-Michaels Co.
Transit Equipment Co.
Zelnicker Supply Co., W. A.

Shades, Vestibule
Brill Co., The J. G.

Shovels
Hubbard & Co.

Shovels, Power
Allis-Chalmers Mfg. Co.
Brill Co., The J. G.

Signals, Car Starting
Consolidated Car Heating Co.
Electric Service Sup. Co.
Nat'l Pneumatic Co., Inc.

Signals, Indicating
Nichols-Lintern Co.

Signal Systems, Block
Electric Service Sup. Co.
Nachod Signal Co., Inc.
Union Switch & Signal Co.
U. S. Electric Signal Co.
Wood Co., Chas. N.

Signal Systems, Highway Crossing
Nachod Signal Co., Inc.
U. S. Electric Signal Co.

Slack Adjusters (See Brake Adjusters)

Slag
Carnegie Steel Co.

Sleet Wheels and Cutters
Anderson M. Co., A. & J. M
Columbia Machine Wks.
Electric Ry. Equip. Co.
Electric Service Sup. Co.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.

Smokestacks, Car
Nichols-Lintern Co.

Snow-Plows, Sweepers and Brooms
Brill Co., The J. G.
Columbia Machine Wks.
Consolidated Car Fender Co

Soldering and Brazing (See Welding Processes and Apparatus)

Spikes
Amer. Steel & Wire Co.

Special Adhesive Papers
Irvington Varnish & Ins. Co

Special Trackwork
Bethlehem Steel Co.
Lorain Steel Co., The

Splicing Compounds
Westinghouse Elec. & M. Co

Splicing Sleeves (See Clamps and Connectors)

Springs, Car and Truck
Bemis Car Truck Co.
Brill Co., The J. G.
Ft. Pitt Spring & Mfg. Co.
St. Louis Car Co.
Standard Steel Wks.
Taylor Electric Truck Co.

Sprinklers, Track and Road
Brill Co., The J. G.

Stair Steps, Safety
Irving Iron Works

Steel Castings
Wm. Wharton Jr. & Co., Inc.

Steel and Steel Products
Morton Mfg. Co.

Steps, Car
American Abrasive Metals Co.
Morton Mfg. Co.

Stokers, Mechanical
Babcock & Wilcox Co.
Westinghouse Elec. & M. Co

Storage Batteries (See Batteries, Storage)

Strain Insulators
Ohio Brass Co.

Strand
Roebling's Sons Co., J. A.

Superheaters
Babcock & Wilcox Co.
Power Specialty Co.

Sweepers, Snow (See Snow Plows, Sweepers and Brooms)

Switch Stands
Ramapo Ajax Corp.

Switches and Switchboards
Allis-Chalmers Mfg. Co.
Anderson M. Co., A. & J. M
Electric Service Sup. Co.
General Electric Co.
Westinghouse Elec. & M. Co

Switches, Selector
Nichols-Lintern Co.

Switches, Tee Rail
Ramapo Ajax Corp.

Switches, Track (See Track Special Work)

Synchroscope
Roller-Smith Co.

Tampers, Tie
Ingersoll-Rand Co.
Railway Track-work Co.

Tapes and Cloths (See Insulating Cloth, Paper and Tape)

Tee Rail, Special Track Work
Bethlehem Steel Co.
Rampo Ajax Corp.

Telephones and Parts
Electric Service Sup. Co

Terminals, Cable
Standard Underground Cable Co.

Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)

Thermostats
Consolidated Car Heating Co
Gold Car Heating & Lighting Co.
Railway Utility Co.
Smith Heater Co., Peter

Ticket Choppers and Destroyers
Electric Service Sup. Co.

Tickets and Transfers
Globe Ticket Co.

Ties, Mechanical
Dayton Mechanical Tie Co.

Ties and Tie Rods, Steel
American Bridge Co.
Carnegie Steel Co.
International Steel Tie Co

Ties, Wood Cross (See Poles, Ties, Posts, etc.)

Tokens
Scovill Mfg. Co.

Tongue Switches
Wm. Wharton Jr. & Co.

Tool Steel
Bethlehem Steel Co.
Carnegie Steel Co.

Tools, Track and Misc.
Amer. Steel & Wire Co.
Columbia Machine Wks.
Electric Service Sup. Co.
Hubbard & Co.
Railway Track-work Co.

Tower Wagons and Auto Trucks
McCardell & Co., J. R.

Towers and Transmission Structures
Archbold-Brady Co.
Bates Expanded Steel Truss Co.
Westinghouse Elec. & M. Co.

Track Expansion Joints
Wm. Wharton Jr. & Co.

Track Grinders
Metal & Thermit Corp.
Railway Track-Work Co.

Trackless Trolleys
Pierce-Arrow Motor Car Co
St. Louis Car Co.

Track, Special Work
Bethlehem Steel Co.
Buda Company
Columbia Machine Wks.
N. Y. Switch & Crossing Co.
Ramapo Ajax Corp.
Wharton, Jr., & Co., Inc., Wm.

Transfer Issuing Machines
Ohmer Fare Register Co.

Transfer Tables
American Bridge Co.

Transformers
Allis-Chalmers Mfg. Co
American Transformer Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Transmission Towers & Structures
Amer. Bridge Co.

Treads, Safety, Stair, Car Step
American Abrasive Metals Co.
Morton Mfg. Co.

Trolley Bases
Anderson M. Co., A. & J. M
Electric Service Sup. Co.
General Electric Co.
More-Jones Brass & Metal Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Ohio Brass Co.

Trolley Bases, Retrieving
Anderson M. Co., A. & J. M
Electric Service Sup. Co.
General Electric Co.
Nat'l Ry. Appliance Co.
Nuttall Co., R. D.
Ohio Brass Co.

Trolley Buses
Brill Co., The J. G.
General Electric Co.
Westinghouse Elec. & M. Co

Trolley Materials
Electric Service Sup. Co.
More-Jones Brass & Metal Co.
Ohio Brass Co.

Trolley Shoes
Economy Elec. Devices Co.
Miller Trolley Shoe Co.

Trolley Wheels (See Wheels, Trolley)

Trolley Wheels, Bushings
More-Jones Brass & Metal Co.

Trolley Wheels & Harps
More-Jones Brass & Metal Co.

Trolley Wire
American Elec'l Works
Amer. Steel & Wire Co.
Anaconda Copper Mining Co
Bridgeport Brass Co.
Roeblings Sons Co., J. A.

Trucks, Car
Baldwin Locomotive Wks.
Brill Co., The J. G.
Bemis Car Truck Co.
St. Louis Car Co.
Taylor Electric Truck Co.
Westinghouse Elec. & M. Co.

Tubing, Yellow & Black Flexible Varnished
Irvington Varnish & Ins. Co

Turbines, Steam
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Turbines, Water
Allis-Chalmers Mfg. Co.

Turnstiles
Electric Service Supplies Co.
Perey Mfg. Co., Inc.

Vacuum Impregnation
Allis-Chalmers Mfg. Co.

Valves
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Varnished Papers
Irvington Varnish & Ins. Co.

Varnish Silks
Irvington Varnish & Ins. Co.

Varnishes (See Paints, etc.)

Ventilators, Car
Brill Co., The J. G.
National Ry. Appliance Co.
Nichols-Lintern Co.
Railway Utility Co.
St. Louis Car Co.

Vestibule Linings
Haskelite Mfg. Co.

Voltmeters
Roller-Smith Co.

Welded Rail Joints
Alumino-Thermic Corp.
Electric Ry. Improvement Co.
Metal & Thermit Corp.
Ohio Brass Co.
Railway Track-work Co.

Welders, Portable Electric
Electric Ry. Imp. Co.
Ohio Brass Co.
Railway Track-work Co
Rail Welding & Bonding Co.

Welding Processes and Apparatus
Alumino-Thermic Corp.
Elec. Ry. Improvement Co.
General Electric Co.
Metal & Thermit Corp.
National Ry. Appliance Co.
Ohio Brass Co.
Railway Track-work Co.
Westinghouse Elec. & M. Co.

Welding Steel
Electric Ry. Improvement Co.
Railway Track-work Co.

Wheel Guards (See Fenders and Wheel Guards)

Wheel Grinders
Wheel Truing Brake Shoe Co.

Wheels, Car, Cast Iron
Asso. of Mfrs. of Chilled Car Wheels
Griffin Wheel Co.

Wheels, Car Steel & Steel Tire
Carnegie Steel Co.
Standard Steel Wks.

Wheel Presses (See Machine Tools)

Wheels, Trolley
Anderson Mfg. Co., A. & J. M
Columbia Machine Wks.
Electric Ry. Equip. Co.
Elec. Service Supplies Co.
General Electric Co.
Gilbert & Sons, B. F. A.
More-Jones Brass & Metal Co.
Nuttall Co., R. D.
Star Brass Works

Whistles, Air
General Electric Co.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Wire Rope
Amer. Steel & Wire Co.
Roeblings Sons Co., J. A.

Wires and Cables
Aluminum Co. of Amer.
Amer. Electrical Works
Amer. Steel & Wire Co.
Anaconda Copper Min. Co.
Bridgeport Brass Co.
General Electric Co
Kerite Insulated Wire & Cable Co.
Okonite Co.
Roeblings Sons Co., J. A. Co.
Standard Underground Cable Co
Westinghouse Elec. & M. Co.

Wood Preservatives
Baker Wood Preserving Co

Woodworking Machinery
Allis-Chalmers Mfg. Co.

CAR step accidents are more frequent than most people realize—and smooth, slippery steps are a pretty big risk any time, but especially in rush hours. One damage suit may cost you more than a "SAFKAR" equipment for every car on your tracks.

There's built-in accident insurance in these sturdy steel safety car steps. There's comfort for passengers, too—a secure foothold that makes for quick passenger interchange.

NON-SLIPPING under all conditions, wet or dry—PERMANENTLY SLIP-PROOF, no abrasive insets, bars or mats to wear out or work loose—EXTREMELY LIGHT WEIGHT—CLEANLY, because dust, dirt, mud and snow fall through—ECONOMICAL AND PRACTICALLY INDESTRUCTIBLE, because all-steel solidly riveted up, self-contained, time-proof and wear-proof—these, summed up, are the distinctive "SAFKAR" values.

There's a size and style of "SAFKAR" Step for every city or interurban car. Write for Catalog 4A28.

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y., U.S.A.

Let Us Work With You

Our engineers will welcome an opportunity to work with yours — submitting "Safkar" Steps for examination and test—cooperating with you in any reasonable way toward greater safety and economy in your car step equipment. Call upon us.

ALPHABETICAL INDEX TO ADVERTISEMENTS

Trenton & Mercer Co. Trac. Corp.

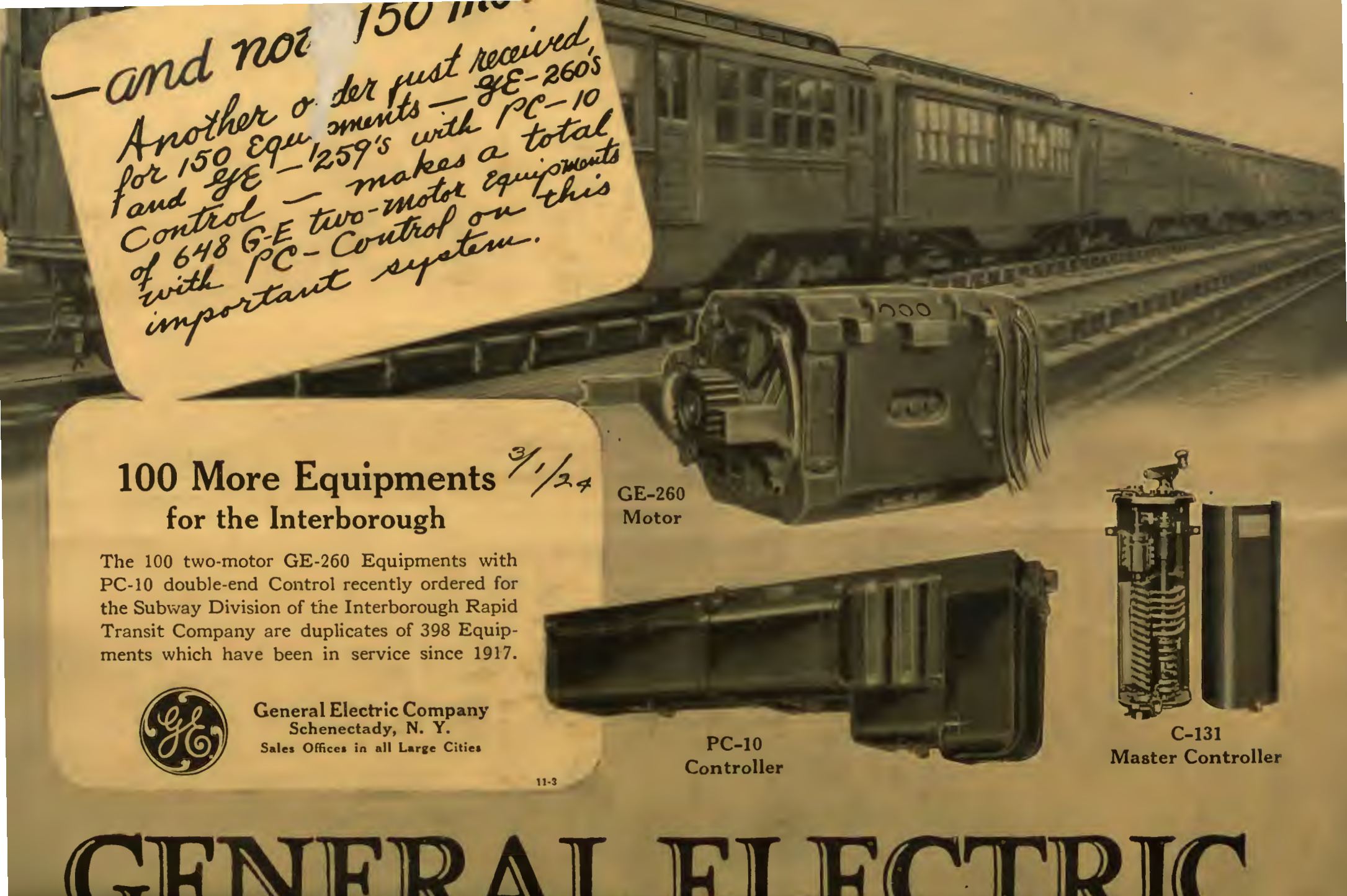
New City and Suburban Cars

Twenty light-weight, one-man two-man cars of this type were recently built in our Philadelphia Plant for Trenton, N. J. Ten cars include quadruple 25 Hp. motor equipment for city service, and ten are equipped with quadruple 35 Hp. motors for suburban service. Otherwise, the cars are practically identical, being mounted on Brill 77-E low-level trucks equipped with Brill Twin Swing Links, measure 44 ft. long over platforms, and seat 48 passengers.

The city cars weigh 34,476 lb. and the suburban cars 36,746 lb.

THE J. G. BRILL COMPANY
PHILADELPHIA, PA.

AMERICAN CAR CO — ST LOUIS MO — G.C. KUHLMAN CAR CO — CLEVELAND OHIO — WASON MANF'G CO — SPRINGFIELD, MASS.



—and not 150 more

Another order just received for 150 Equipments — GE-260's and GE-1259's with PC-10 Control — makes a total of 648 G-E two-motor equipments with PC-Control on this important system.

100 More Equipments 3/1/24
for the Interborough

The 100 two-motor GE-260 Equipments with PC-10 double-end Control recently ordered for the Subway Division of the Interborough Rapid Transit Company are duplicates of 398 Equipments which have been in service since 1917.

GE-260 Motor

PC-10 Controller

C-131 Master Controller

General Electric Company
Schenectady, N. Y.
Sales Offices in all Large Cities

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GENERAL ELECTRIC