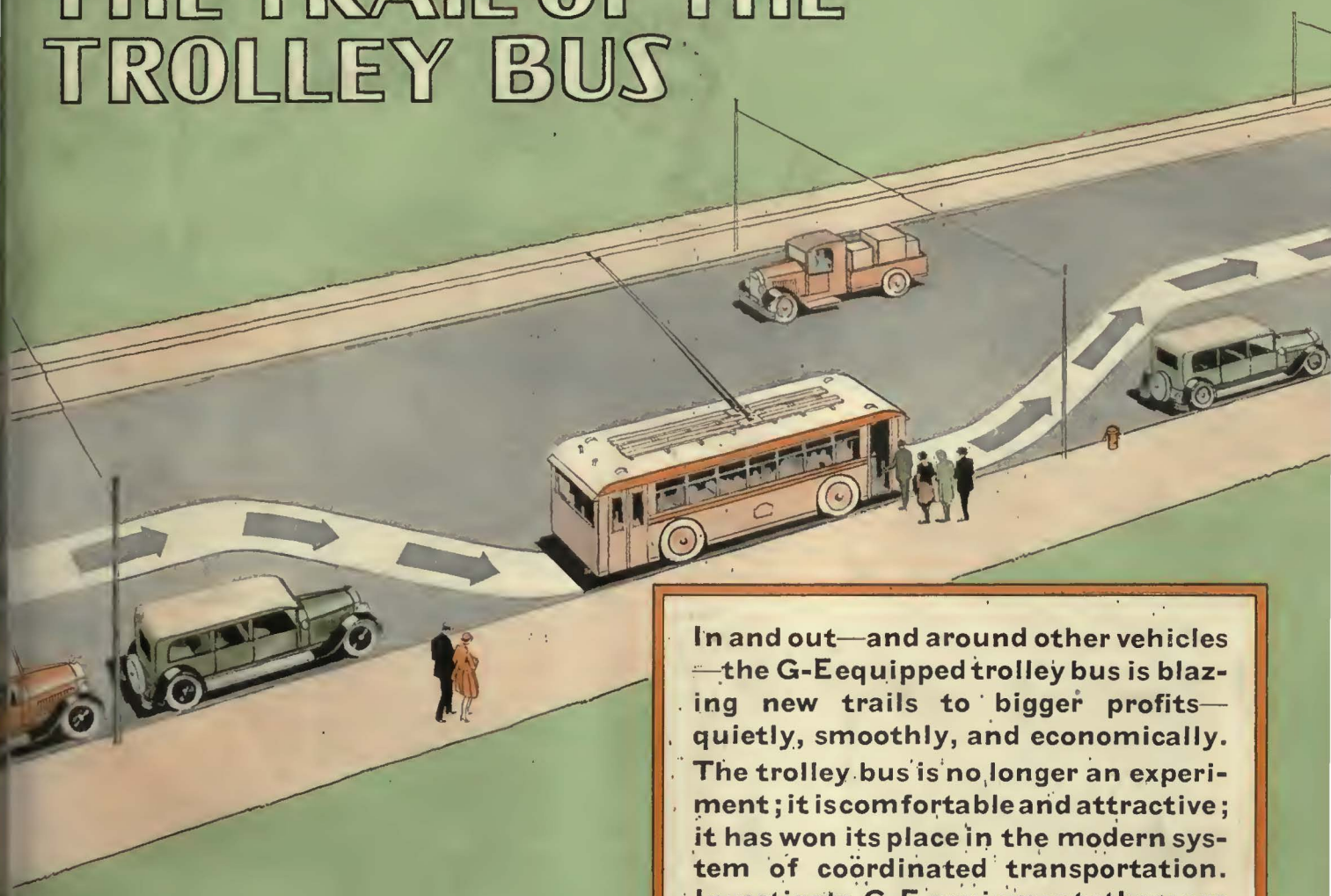
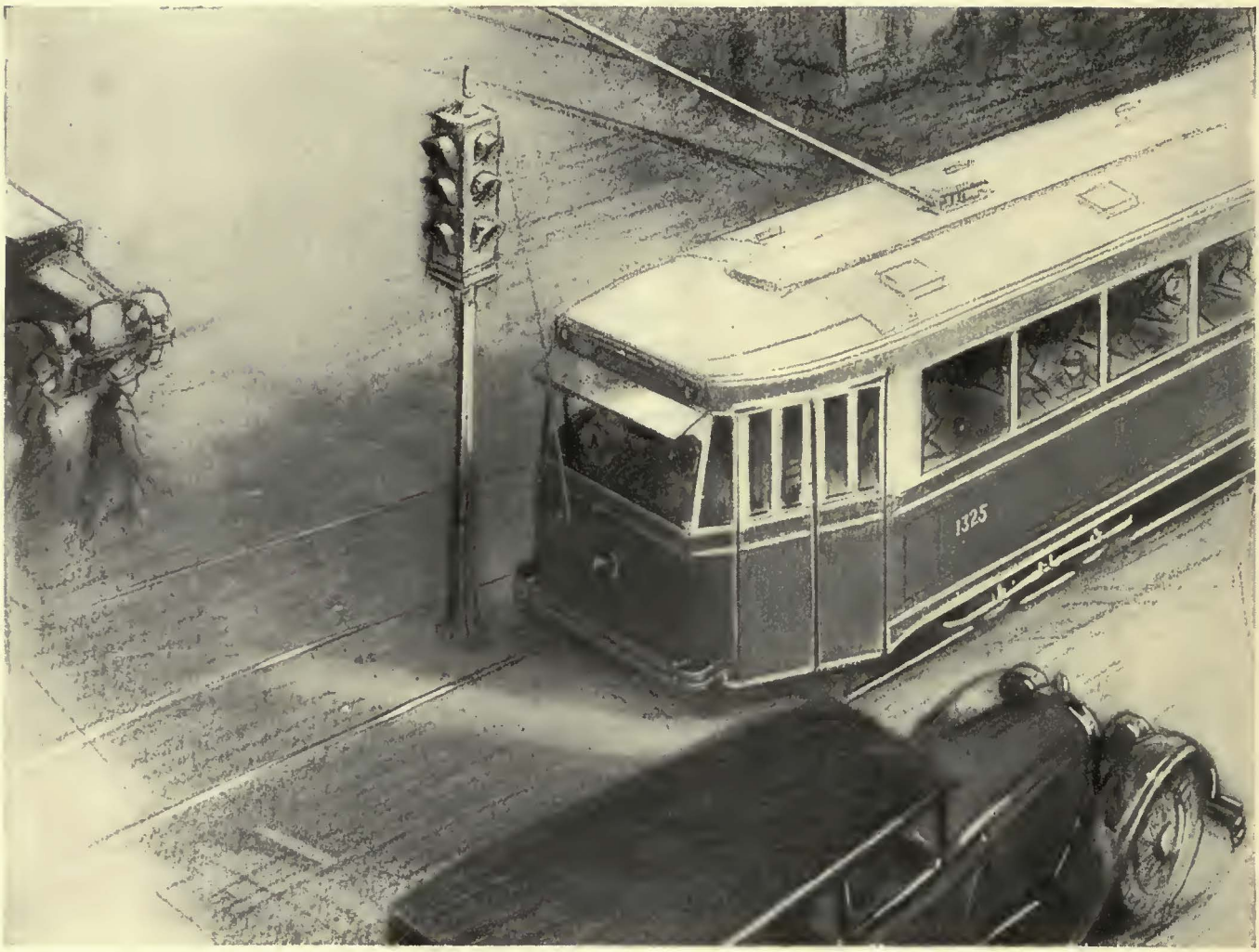
ANNUAL STATISTICAL AND PROGRESS NUMBER

ELECTRIC RAILWAY JOURNAL

...w-Hill Publishing Company, Inc. JANUARY, 1930 Thirty-five Cents per Copy

THE TRAIL OF THE TROLLEY BUS





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Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review

JOHN A. MILLER, JR., *Managing Editor*

Vol. 74, No. 1 *Pages 1 to 64*

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1930

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JANUARY, 1930

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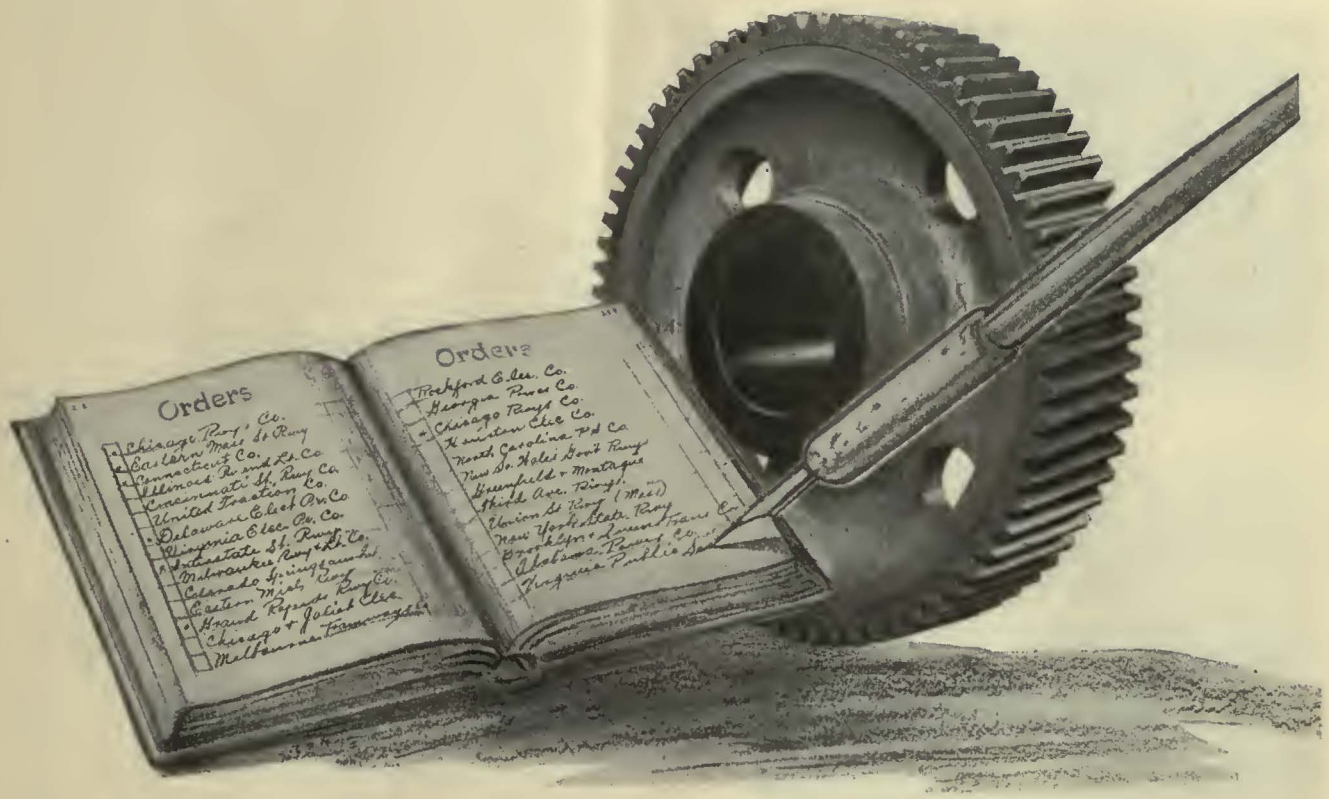

The list grows longer - -

ONE after another electric railway companies, large and small the country over, continue to place their names upon the roster of users of Westinghouse-Nuttall quiet gears.

The intense interest which has followed this revolutionary improvement since its introduction scarcely two years ago, is reflected in the fact that at present more than 30 properties have specified these gears both for replacements and as part of new equipment. Among these are many of the largest orders for new cars placed during the past year.

Such ever-increasing use of Westinghouse-Nuttall quiet gears is a significant indorsement of their importance as a fundamental requirement wherever quiet car operation is to be secured.

The Westinghouse-Nuttall noise-eliminating feature may be applied to either helical or spur gears.

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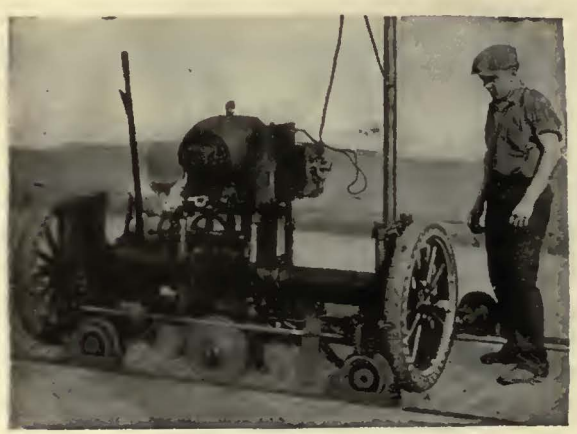
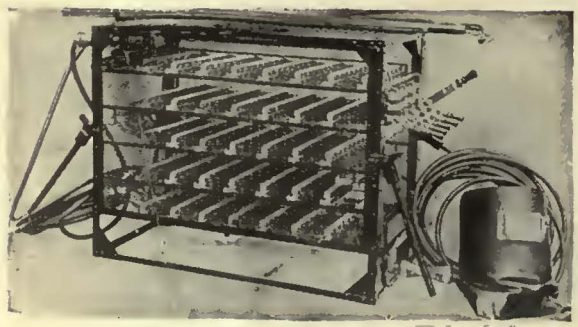
Improved Atlas Rail Grinder

Eureka Radial Rail Grinder



Imperial Track Grinder



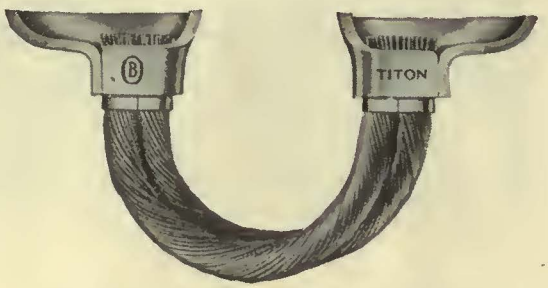
Ajax Electric Arc Welder

For a prosperous year

How Over 125 Electric Railways Secure Efficient Rail Bonding

O-B Titon Bonds, Installed with Duron Welding Rod, Improve Reliability of Return Circuit.

FROM coast to coast, from Canada to Mexico and in many foreign countries, operators of electric railway properties have solved many rail bonding problems by installing Titon Bonds.

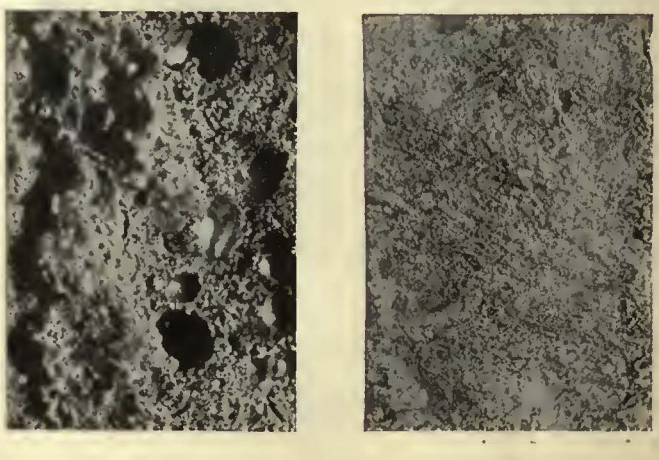


The O-B Titon Bond, for installation on ball of rail, over standard joint plates. Observe how the cupped terminal holds the welding material while in a molten state, thus assuring complete union between cable and rail.

In the few short years since Titons were first offered to the industry, experience shows a marked reduction in maintenance and replacements, with vastly improved efficiency due to the longer life and permanently lower resistance possible with *properly-installed* Titon Bonds.

Proper installation requires, in addition to a bond of correct design, a welding rod of definite characteristics. A dense weld, free from gas bubbles, which form a homogeneous union with the rail, is absolutely necessary to long life and low resistance.

The use of O-B Duron Welding Rod provides such a weld. Compare the above microphotographs of sheared sections. Why the weld made with O-B Duron Rod will and does render far better service than is possible



Microphotographs of welds sheared from rail. At the left is a weld made with ordinary scrap copper wire. Note the porosity and poor union with the rail. The weld at the right, made with O-B Duron Welding Rod is dense, free from porosity and makes a homogeneous union with the rail.

with less efficient material is obvious to the critical eye. A resistance welder, with negative rail polarity is used.

The service rendered by O-B Titon Rail Bonds throughout the industry is definite proof that this design, regardless of the welding material, is greatly improving performance. With the use of O-B Duron Welding Rod even this improved performance is bettered.

The O-B Hevi-Bede Titon Rail Bond for installation on ball of the rail, where heavily beaded or Weber type joints are used.

If you, too, have rail bond problems—if you want lower return circuit resistance, greater reliability and much longer life, why not investigate O-B Titon Rail Bonds?

Ohio Brass Company, Mansfield, Ohio
Canadian Ohio Brass Co., Limited
Niagara Falls, Canada
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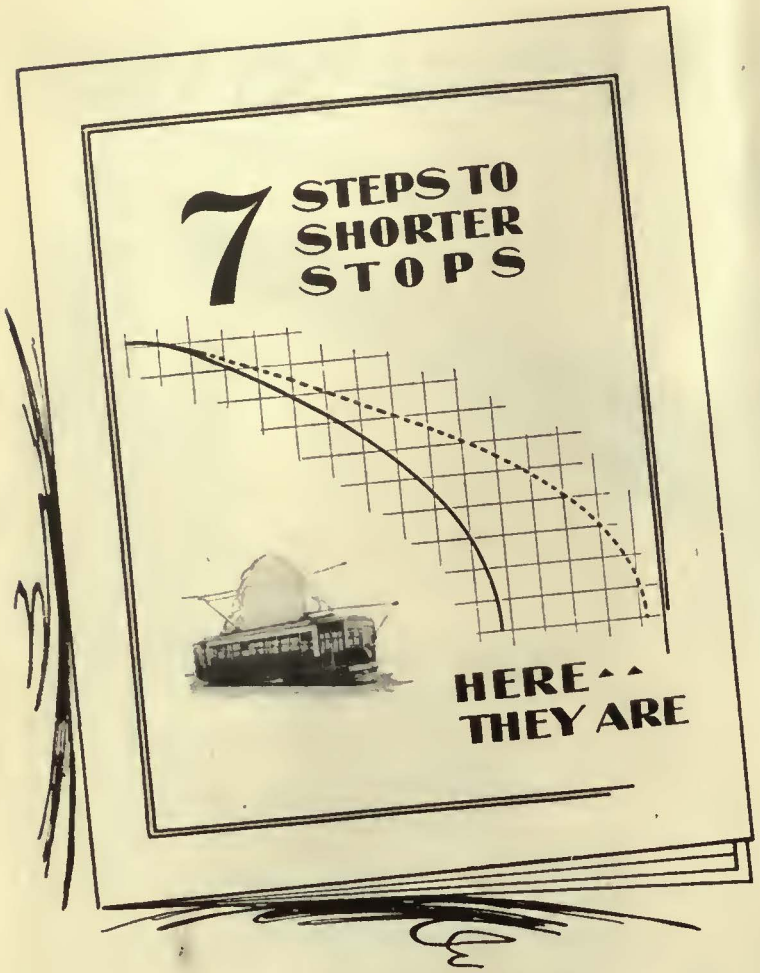

Do you have *your* copy?

YOU have, no doubt, been following our series of advertisements dealing with the seven factors that influence stopping distance. . . . The interest manifested in this series by street railway men throughout the country has indicated an eagerness for better brake performance. . . . These advertisements have now been reprinted in booklet form for ready reference and connected study by those interested. If you have not already received a copy, write for one now. Ask for Publication 9073.

Remember, also, that our engineers are always available for assistance in solving your braking problems.

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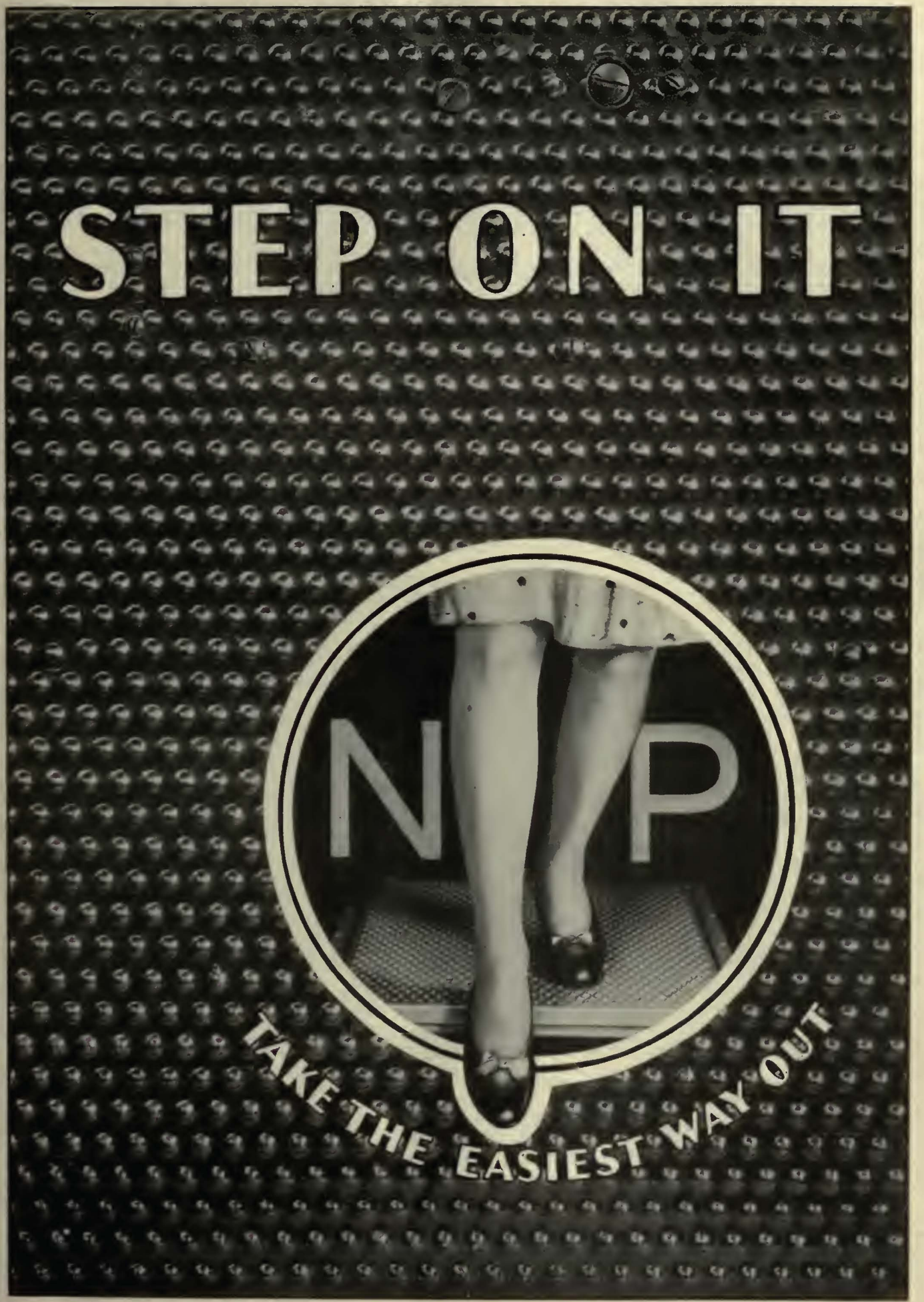
STEP ON IT
N P
TAKE THE EASIEST WAY OUT

J-M Brake Blocks are making unusual performance records on Bus Lines . . .

MORE than 650,000 safe, quick, quiet stops is an unbelievable record for any braking material. Yet the J-M Brake Blocks shown in the photograph below made this record in 25,000 miles of service . . . and this set of blocks is still good for thousands of miles additional cost-free braking service.

This is not an isolated record of the money-saving, safe service that J-M Brake Blocks give the bus operator. More than sixty companies have tested this friction material with uniformly successful results.

J-M Brake Blocks, adaptable to many types of equipment, have been specially designed to meet the operating conditions of modern bus service.

J-M Brake Blocks, made of moulded asbestos, resist the action of oils and greases. They reduce costs by giving thousands of miles of extra service, by reducing shop time for adjustments, by increasing tire life through smooth gripping and by eliminating road delays. J-M Brake Blocks provide quiet and positive braking action. They allow higher running speeds and quicker stopping with absolute safety. They are particularly recommended for use on alloy or high-carbon drums.

From the standpoint of safety, efficiency and reduced cost of operation we ask that you test this J-M friction material. The coupon will bring you further information and performance facts.

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J-M Brake Blocks are recommended for use on air brakes which may be either of the diaphragm type, requiring a tank pressure of 60 lbs. or of the wheel cylinder type, requiring a pressure of from 100 to 110 lbs. They are also applicable to mechanical brakes, with vacuum boosters. These may be two wheel or four wheel brakes, the latter being used extensively on 17-21 passenger coaches. The size of the friction material in each instance runs from 1-4" to 7-8" thick. In the manufacture of J-M Brake Blocks, composition, density, hardness and dimensions are carefully controlled.

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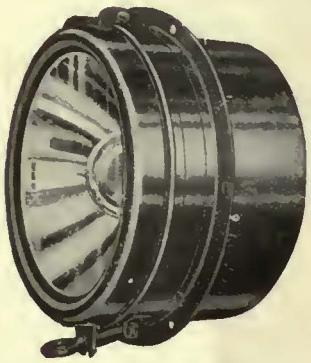
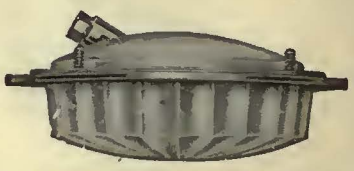


Golden Glow Railway Car Headlights

Golden Glow Bus Headlights



Dome Type A Keystone-Ivanhoe Fixture

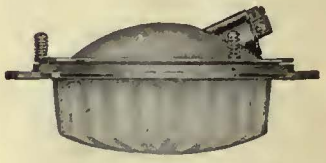
Keystone Trolley Catchers

Type 129 Hunter Sign—mechanism

Type T Lighting Fixtures

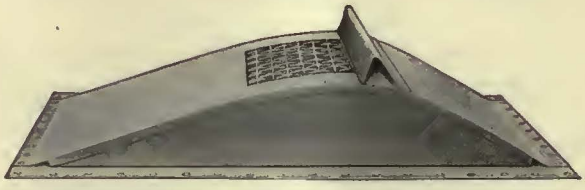
Typical Hunter Illuminated Sign

Faraday Push Buttons



Dome Type S Keystone-Ivanhoe Fixture

Faraday Car Signal Systems



Keystone Roof Type Bus Ventilator

Faraday Buzzers

ELECTRIC SERVI

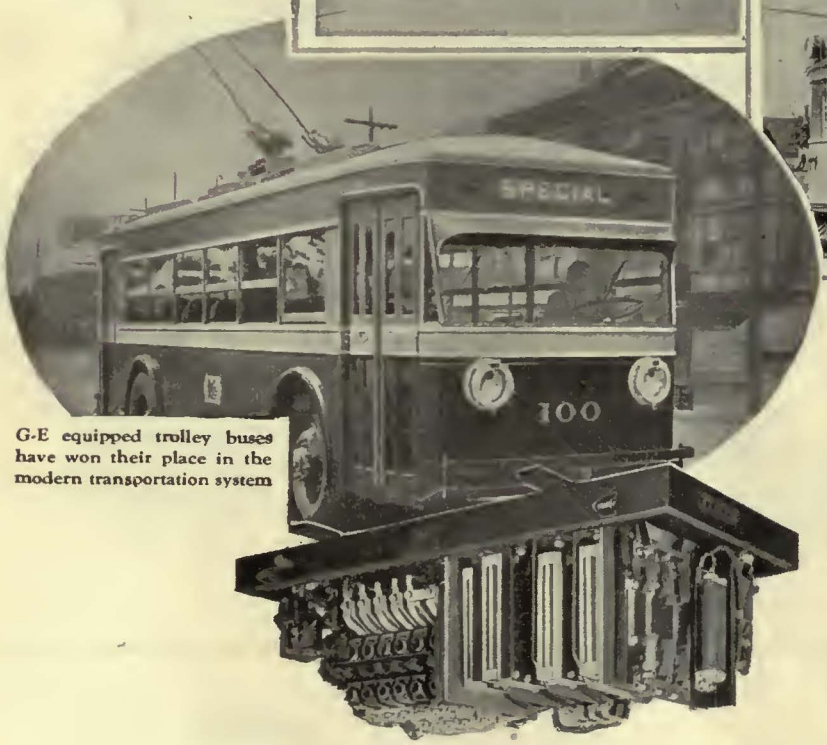
Home office and manufacturing plant located at 17th and Cambria Streets, Philadelphia, Pa.; District offices are located at 111 North Canal Street, Chicago, Ill. and 50 Church Street, New York City.

A Review of Recent

(Above) The Chicago Surface Lines specified PCM control and G-E air brakes for 100 new cars. Forty are equipped with GE-301, low-wheel motors

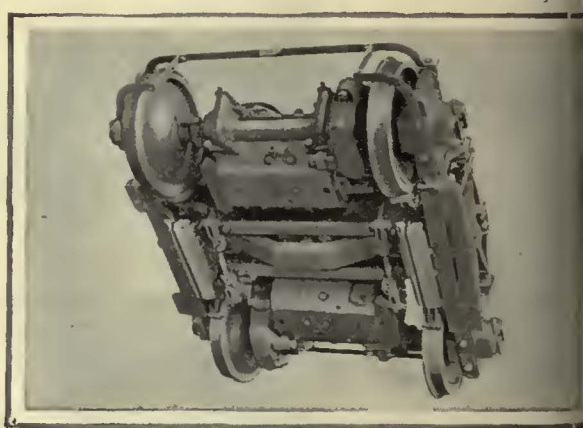
(Left) G-E motors, PCM co trol, and G-E magnetic tra brakes are responsible f unusual performance of th ne car, operated by the ni Traction Co., Albany, N Y

(Above) The Gary Railway Company of Gary, Ind., operates 7 G equipped street cars. Several are of this modern type



G-E equipped trolley buses have won their place in the modern transportation system

PCM control provides smooth, quick acceleration. It is simple, compact, and reliable



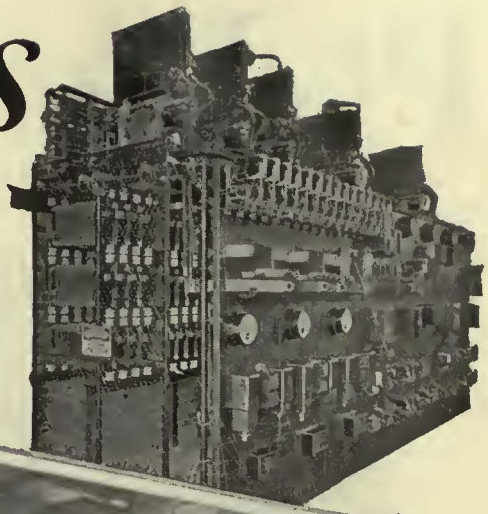
(Above) G-E magnetic track brakes are designed to prevent accidents

GENERAL

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

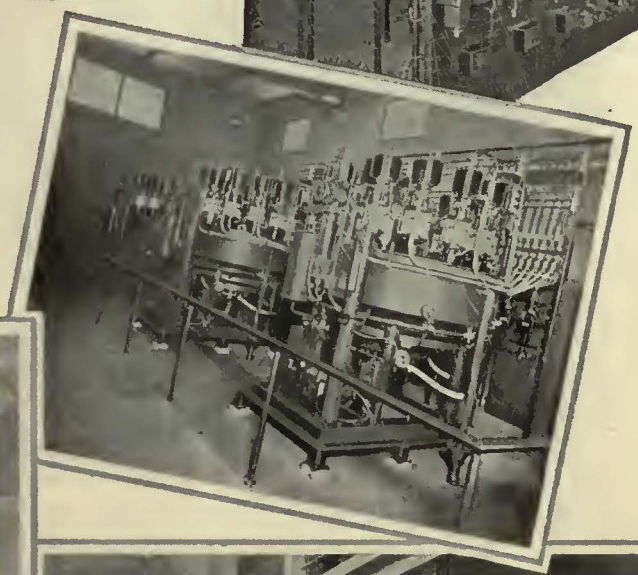
Developments

IN recent years, the necessity of realizing every possible economy in operation and maintenance has become increasingly important. Now—more than ever before—the railway industry has opportunities, through the use of General Electric equipment, to effect sound economies and also to provide better service for the public.

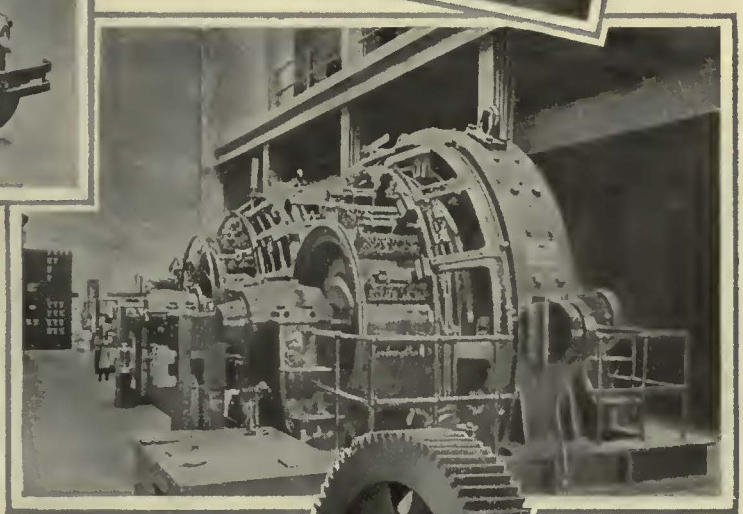


(Right) Automatic switching equipment for mercury-arc rectifiers, Piedmont and Northern Railway

(Below) 1,000-kw., 600-volt, mercury-arc rectifiers, Philadelphia Rapid Transit Co.



(Above) The Public Service Coördinated Transport of New Jersey now operates more than 1,000 G-E equipped gas-electric buses



(Above) One 4,000-kw. and two 2,000-kw., 650-volt, manually controlled, synchronous-converter units, Brooklyn-Manhattan Transit Corp.

(Left) G-E line-material products include overhead equipment for trolley-bus operation

(Left) The G-E non-resonant gear contributes much toward quiet car operation

330-141

ELECTRIC

SALES OFFICES IN PRINCIPAL CITIES

Electric Railway Journal

Consolidation of
Street Railway Journal and Electric Railway Review
A McGraw-Hill Publication—Established 1884

JOHN A. MILLER, JR., *Managing Editor*

Volume 74 New York, January, 1930 *Number 1*

Accelerated Progress

FORECAST BY RECORD OF PAST YEAR

FIRM FAITH in the future is shown by the intention of the electric railways to spend almost $375,000,000 during the next twelve months for extensions, betterments and maintenance. Building slowly but surely on a firm foundation, the industry has steadily improved its position in recent years until today it looks forward with renewed confidence. Figures received by this paper from companies representing more than 97 per cent of the electrified track mileage of the United States and Canada show that the record of 1929 is more encouraging in nearly every way than the record of any other recent year. Estimates for 1930 indicate that even greater progress may be expected during the year just beginning.

Operating Results Improved

FINANCIAL results of operations in 1929 were notably better than in 1928. The total number of passengers carried by the cars and buses of the electric railways last year was slightly greater than during the preceding year. The average fare increased a fraction of a cent. Gross earnings showed a moderate gain. On the other hand, wages and construction costs remained fairly steady, and more efficient operation permitted a substantial reduction in expenses. As a result, net income was considerably improved. Apparently the recent disturbance in the stock market has had little, if any, harmful effect upon the electric railways. Despite some uncertainty concerning the general business outlook, indications are that revenue will be as good in 1930 as in 1929, or perhaps slightly better, and that operating expenses may be still further reduced.

Budget Figures Show Gain

EXPENDITURES made during 1929 for new plant and equipment, maintenance materials and supplies, and construction and maintenance labor, totaled more than $355,000,000. This total is about 4 per cent higher than the figure of similar expenditures made during the preceding year, and is slightly more than was forecast by this paper last January.

Estimates for expenditures during 1930 reflect clearly a recognition of the continuing need for rail service. An increase of $3,000,000, is indicated in expenditures for new cars, making a total of about $32,000,000. Way and structures expenditures will be increased $7,000,000 to a total of more than $88,000,000, not including the cost of regular maintenance work. The power and line budget shows a similar but somewhat smaller increase. At the same time continued expansion of bus operation is forecast by expenditures of some $20,000,000 estimated under that heading.

Rolling Stock Purchases Increased

APPROXIMATELY 1,400 cars were bought by the electric railways in 1929 as compared with less than 900 in 1928. Cars designed for carrying heavy loads in the larger

cities pre-dominated in the purchases last year, but it is notable that a considerable number of companies operating in the smaller cities are also found in the list of purchasers. Included in the total is one order for 300 rapid transit cars for New York City and several orders totaling more than 200 cars for multiple-unit operation in electrified suburban service. One hundred trail freight cars were bought by the electric railway industry, and 77 electric locomotives. Moreover, some 2,300 old cars were scrapped during the year.

Bus Operations Expanded

THE number of new buses bought last year was even larger than the number of new cars, being over 1,800. At the same time nearly 400 additional buses were acquired through the purchase by the railways of independent lines already in operation, making a total gain of about 2,200 buses. This increase is only a little less than that which occurred in 1928, a year of notable expansion in the bus operations of the electric railways. Some 700 buses were scrapped or otherwise disposed of. It is interesting to note that this is equivalent to 70 per cent of the number of buses bought by the electric railways five years ago. Extensions to existing bus routes and new routes added during 1929 totaled nearly 4,000 miles, a considerably larger increase than occurred during the preceding year.

Particularly significant is the increase in the number of trackless trolleys operated by the electric railways. After a promising beginning about ten years ago this type of transportation waned in popularity until it appeared to be on the verge of disappearing entirely. More recently, however, important improvements in the design of the vehicle have restored it to favor. While it is too early as yet to prophesy how far the adoption of trackless trolleys is likely to go in the future, it is evident that this type of vehicle has promising possibilities for rendering efficient transportation service under the conditions to which it is suited.

Volume of Trackwork Large

EXTENSIONS and reconstruction of electrified tracks totaled over 1,050 miles last year. Of this amount more than 850 miles represented increases and improvements to the trackage of the urban and interurban electric railways, and some 200 miles represented electrification of lines formerly operated by steam. While these figures show a slight decrease from the corresponding figures for 1928, they are considerably above the average for the past ten years.

Coincident with the additions made to the trackage and equipment of the electric railways, certain decreases also have occurred. Considerable track was abandoned during the year just ended, the total being approximately 1,000 miles. This is substantially less than the mileage of abandonments which occurred in 1928. Moreover, there was a marked reduction in the number and mileage of properties that were entirely abandoned.

Partial abandonments by companies which continued rail operation on other routes constituted by far the larger part of the decrease in mileage which occurred last year. From this it is evident that real progress is being made in co-ordination, rail service being retained where it is justified by the relationship between revenue and expense, and bus service being instituted in its place where conditions are more favorable for that type of operation.

Industry Strengthened By Readjustment

AS A NET result of these changes the electric railways find themselves at the beginning of the new year with a slightly reduced mileage of track, and a slightly smaller number of cars, but with a substantially larger number of buses and mileage of bus routes. Without doubt, this readjustment has greatly strengthened the position of the industry by enabling it more effectively to meet the transportation demands of the traveling public. That further readjustment along similar lines will occur during 1930 appears certain. From this it is not to be inferred, however, that wholesale substitution of buses for cars is in prospect. Substitutions will continue to be made where they appear to be advantageous, but the necessity for rail service on heavy traffic lines is steadily becoming more widely recognized.

These facts furnish convincing evidence that the industry is in a fundamentally sound condition. Notable progress was made during the year just ended and every indication points to an even greater advance in the year now beginning.

Electric Railway Industry in More

Favorable Position

With revenues approximately the same as in the previous year, the companies have been able to make readjustments for reduced operating expenses, making the net revenue for 1929 the largest in the history of the industry. Statistics show the progress made over a period of years

WITH another year added to the record, the electric railway industry is found in a more stable position than it has been in for some time. It has continued during 1929 along lines similar to those followed in the previous year. The results of a number of influences that have been at work for some time are, however, only beginning to make themselves apparent, so that the industry has been able to make readjustment to the end that greater net revenues have been obtained. The increase in the number of automobiles used for private, urban and suburban transportation has continued at a pace only slightly retarded from its maximum of a few years ago. Even with this the revenues of the electric railways have held up. At the same time it has been found possible to introduce economies, some of them of a major character, so that expenses have not increased. As a result of these two trends acting together, the net income of the electric railway properties for the year, according to the preliminary estimates now available, actually will be the highest the industry has known.

Financial results for the past year's operations, shown graphically on the right edge of Fig. 1, may be compared at a glance with those of past years. This chart, which has been prepared with the assistance of the American Electric Railway Association, shows the financial history of the industry since 1907. The figures for the years 1907 to 1922, inclusive, are from the United States census of street and electric railways, and the others are from the association's records. Inspection of the chart shows that from a net income in 1907 of $40,000,000 retained out of gross revenues of $430,000,000, the business done by the electric railway properties has expanded so that last year the net earned was approximately $83,000,000 out of total revenues amounting to slightly less than $1,130,000,000. On a per cent basis the return has diminished considerably, the net income being 9.4 per cent of the gross in 1907 and only 7.4 per cent in 1929. However, the net income has been increasing steadily each year since 1924, when it was only 4.2 per cent of the gross. This change is of immense importance when the status of the industry as a going concern is under consideration. It is reflected in the improved standing of electric railways with financial interests generally. The approximate figures for the distribution of the expenses for the past year are: wages $424,000,000; other operating expenses,

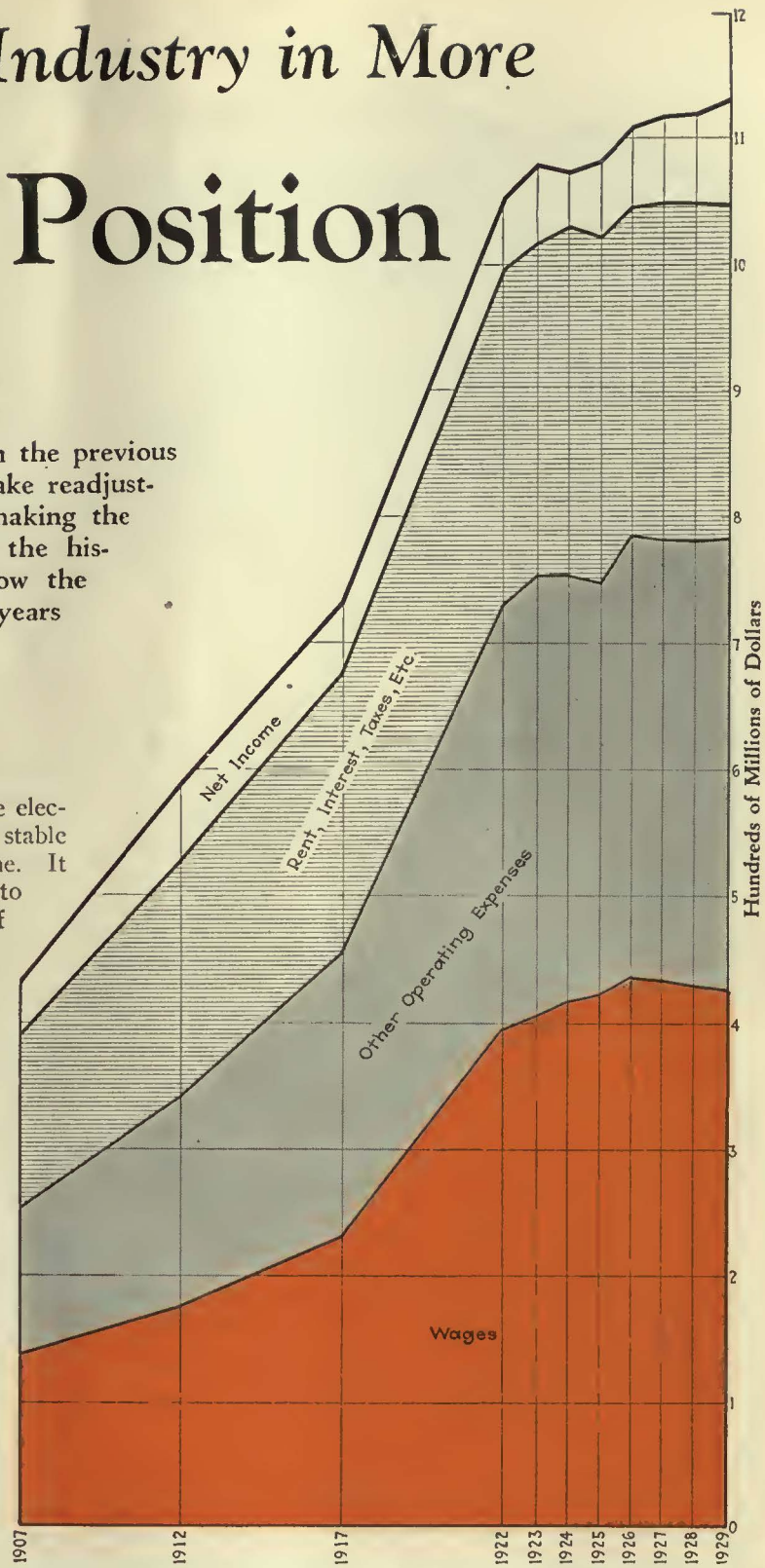


Fig. 1—Distribution of revenues of electric railways of the United States
Figures for 1907, 1912, 1917 and 1922 are from the U. S. Census, and for other years from data collected and compiled by the American Electric Railway Association.

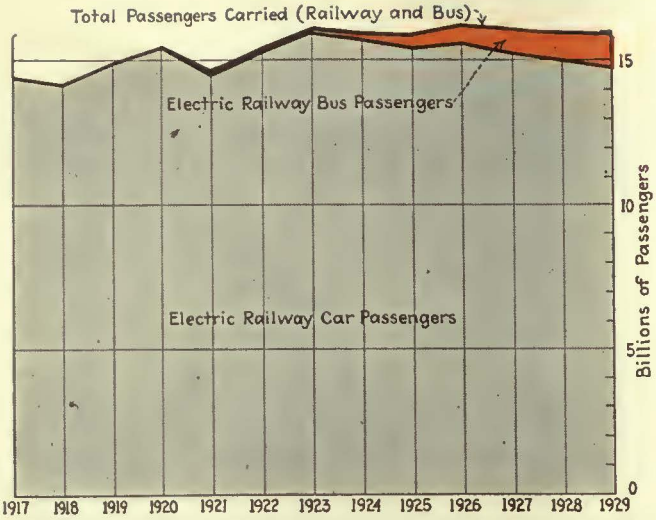


Fig. 2—Total annual passengers of United States electric railways and their bus subsidiaries

Compiled from U. S. Census figures for 1917 and 1922 and from A.E.R.A. data for other years.

$357,000,000; rents, taxes, interest and similar charges, $264,000,000. Wages thus represent 37.6 per cent of the total revenue. Other operating expenses are 31.6 per cent, and rents, interest, etc., are 23.4 per cent of the gross revenue. The ratio of operating expenses to gross revenue stood at 69.2 per cent, which is less than the operating ratio in any recent year.

Passenger Traffic Almost Constant

In number of passengers carried the industry has shown but little change from year to year for some time. In a number of the smaller communities there has been a reduction in riding on street cars, but this has been balanced to a large extent by an increase in the riders on buses operated by the street railway interests. In some of the larger cities there has been a gain in both car and bus passengers. Fig. 2 shows the total number of passengers carried on the vehicles operated by the electric railway companies from 1917 on, separated into car and bus riders. In this chart the figures for electric railway passenger traffic are based on the 1917 and 1922 United States censuses of electric railways, while those for other years are estimates of the American Electric Railway Association. The total number of passengers carried in 1929 was approximately 15,830,000,000, of which 14,740,000,000 were car passengers and the remaining 1,090,000,000 were bus riders.

Miles of Route Covered Expanded Greatly in Ten Years

The track mileage and mileage of bus routes operated by electric railway companies are shown graphically in Fig. 3. During the period from 1917 down to the present there has been an increase of enormous proportions in the length of streets, highways and private rights-of-way over which street and electric railway cars and buses are run. The chart shows that in 1918 there were some 45,000 miles of electric railway tracks and 2,630 miles of electrified steam railroad in the United States. At that time there were no bus routes, and none were recorded until 1920, when there were about 1,000 miles. From year to year there have been minor suspensions of service on tracks which were non-productive, or where buses could be used to replace the cars to advantage. These abandonments have been offset to some extent by extensions of track. In practically every instance where such extensions have been made they were justified economically, as it now is possible to use the bus for extensions of service into territory where there is uncertainty of the need for it. In a number of instances the necessity for maintaining track and rehabilitating it has disappeared, since it is possible to use buses to replace it to good advantage without continuing the liability for excessive taxation and paving charges which in the past have been assessed against the electric railway companies and have proved a severe handicap to successful operation. Where service is not too heavy this plan has proved advantageous.

In other instances abandonment of track has resulted from the need for more direct routing. Many lines were laid out without regard to obtaining the most direct or fastest service, but were distorted to satisfy real estate operators and others who for one reason or another demanded a deviation from the best route. In such instances the bus has usually been accepted as a substitute over the route which best serves the patrons at the present time. The abnormal rise in construction costs without a corresponding rise in revenue caused a situation due to which some of the smaller railway companies were unable to survive the onslaught of much higher operating expenses without an adequate amount of traffic. Then, too, the advent of the private automobile took away sufficient traffic that certain lines became unremunerative.

It is a matter of common understanding that in the heyday of the promotion of electric railway lines 20 to 30 years ago many miles of track were constructed that never should have been built. The territory in which they were placed was not, and could not be, productive of sufficient traffic to warrant them. Although they were a drag on the system, the remainder brought in sufficient revenue to carry the loss. When the war came, bringing in its wake greatly increased costs of operation and maintenance, and when the number of passenger automobiles increased to a total undreamed of in the days

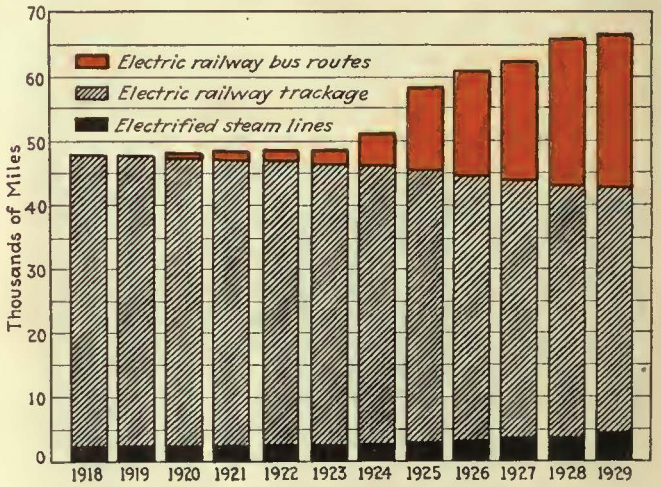


Fig. 3—Electric railway track and bus route mileage in the United States

Figures compiled by Electric Railway Journal.

of the promoters, all within the space of a few years, such unwarranted railway lines were wiped out. Some of them were replaced by bus lines, but in other instances no public transportation of any sort is now given. While the process has been going on for several years, it is not yet completed. There still is some rail-

way track that was uneconomically located at the beginning, and which is a drag on the more prosperous portions of the systems.

Little Change in Number of Vehicles but Capacity Increases

Despite the large numbers of cars and buses that are retired annually, there has been little change in the total number for the last several years. At present there are approximately 111,000 cars and buses in use in the United States, of which 73,768 are passenger cars and 11,854 are buses. The remainder are divided between electric locomotives, freight, service, and miscellaneous cars. It is noteworthy in this connection that the improvement in electric railway cars has made possible the retirement of large numbers of obsolete vehicles and their replacement by a smaller number of new, fast, light-weight cars that are operated today to give an increased number of car-miles. The buses likewise are vastly improved from those that were first introduced, so that comparisons of numbers alone do not give an adequate picture of the change that has been wrought in the past ten years or so. Fig. 4 merely indicates the increase in vehicles that has taken place from 1917 to the present time.

A measure of the actual service rendered by the industry is given in Fig. 5, which shows the vehicle-miles of the cars and buses operated by electric railway systems for the past thirteen years. More and more service is being rendered to the public year by year, as will be noted by a comparison of the vehicle-miles in this chart and the number of passengers carried in Fig. 2. When it is remembered that the modern cars and buses are larger, and not only have more seats but more standing room, the increase becomes even more noteworthy.

Traffic Holds Up Despite Unfavorable Industrial Situation

Another trend which may be noted with considerable interest is the relation between industrial employment and riding. During the four years shown in Fig. 6 there has been comparatively little change in the employment index, save for a relatively brief period in 1928. In the summer of that year the index fell to a low

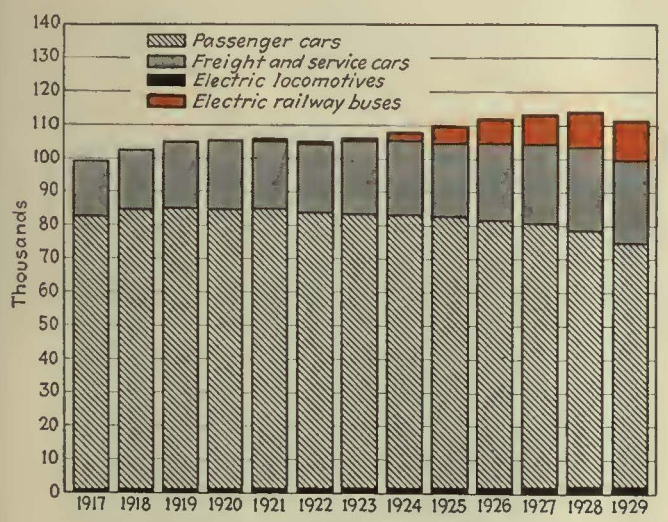


Fig. 4—Cars and buses of the electric railways of the United States
Figures compiled by Electric Railway Journal

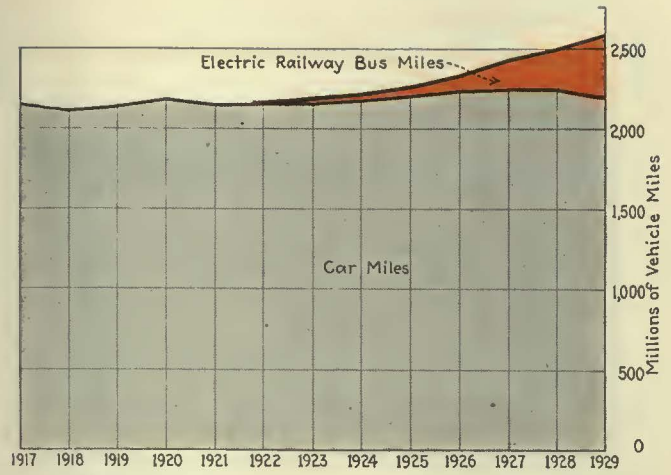


Fig. 5—Revenue vehicle-miles operated annually by United States electric railway systems
Car-miles for 1917 and 1922 from U. S. Census, for other years from A.E.R.A.

figure of 93.1, where it remained for two months, recovering to a present high of 98.5, as compared with 101.2 in the fall of 1926. Passenger traffic, on the contrary, has not followed this trend directly, if at all. It reached a high value of 101.43 in March, 1927, falling gradually and with minor fluctuations to 97.37, the index for October, 1929. There was no drop in riding corresponding with the low employment figure of 1928, and hence there was no corresponding rise during the present year with the improvement in the labor situation.

Undoubtedly a long period of depression would have a more marked effect on the riding habit. On the other hand, it probably would cause a reduction in the use of automobiles, as the operating cost of the motor vehicle would in that instance require a more careful analysis by its owner, who today is interested far more in its convenience as compared with public transportation. As there has been no such period of depression since the automobile has become a large factor in local transportation, the best estimates of what would happen in such an event are little more than guesses. It appears probable, judged by past depressions, that the loss of riding would be decidedly less than the reduction in employment, and under today's conditions there might even be an increase. That, however, is purely a matter of conjecture.

Automobile Affects Riding Less than Popularly Supposed

Many writers have laid all the ills of the transportation industry to the growth in use of the passenger automobile. Fig. 7 shows how far from the truth is the idea that the industry has received a death-blow from this source. The riding habit, or number of rides per capita, is the best measure available for the use made of transportation vehicles. In the period shown it has ranged between 101 and 116, the high figure being reached in 1923, which was the banner year for street car riding. Contrasted with this is the increase in the registration of automobiles, which has gone up from 35 per thousand of population in 1917 to 189 in the year just closed. Naturally it might be expected that the great increase in a new mode of transit would cause a reduction in riding on public vehicles so great that their operation, even in large cities, would be unprofitable. Instead, with a 50 per cent increase in registrations since 1923, the reduction in car and bus riding has been from

Statistics of City and Interurban Electric Railways and Electrified Steam Lines

(As of January 1, 1930)

	Number of Operating Companies	Miles of Track	Passenger Cars		Electric Locomotives	Freight Cars		Service Cars	Buses Operated	Miles of Bus Route
			Motor	Trailer		Motor	Trailer			
New England States										
Connecticut	8	1,290.51	1,395	105	146	54	8	214	217	542.90
Maine	12	422.93	321	8	7	25	69	94	5	25.00
Massachusetts	25	1,912.67	3,773	288	6	23	12	752	713	1,131.87
New Hampshire	11	125.03	172	0	2	0	1	30	41	71.48
Rhode Island	3	301.74	585	9	3	15	0	113	164	160.60
Vermont	4	20.10	7	0	3	2	1	3	23	32.20
Eastern States										
Delaware	1	70.02	113	0	0	0	0	15	22	47.49
District of Columbia	5	395.06	862	24	6	2	13	109	144	287.98
Maryland	5	667.75	1,277	156	3	28	95	148	231	1,602.14
New Jersey	13	1,164.16	2,679	100	0	5	0	327	2,458	3,184.75
New York	71	5,275.54	16,056	2,773	203	196	87	1,524	831	947.73
Pennsylvania	78	3,889.03	6,876	261	9	117	82	931	892	1,518.93
Virginia	13	677.30	684	61	16	10	7	82	247	171.43
West Virginia	10	635.34	365	0	19	25	28	54	128	642.05
Central States										
Illinois	49	3,245.18	6,327	975	80	88	2,787	766	463	1,371.73
Indiana	24	2,496.17	1,619	89	23	426	519	436	443	1,330.46
Iowa	23	984.32	614	43	39	13	1,036	193	150	1,089.18
Kentucky	7	495.49	731	71	0	24	0	126	84	77.21
Michigan	22	1,273.50	2,208	295	27	57	153	254	1,036	1,855.57
Minnesota	8	694.71	1,198	26	2	1	0	99	117	144.54
Missouri	14	1,152.26	2,281	186	5	14	22	338	179	248.56
Ohio	49	3,267.08	3,475	585	26	173	577	645	986	1,878.72
Wisconsin	15	767.03	1,199	54	8	8	4	42	310	1,471.92
Southern States										
Alabama	10	329.53	397	62	2	3	0	61	15	24.24
Arkansas	7	119.23	233	10	0	2	0	17	20	20.60
Florida	7	209.82	382	2	0	2	2	24	90	67.15
Georgia	7	370.42	535	21	2	8	10	44	69	45.39
Louisiana	8	285.65	787	47	0	2	0	78	61	72.76
Mississippi	7	24.00	35	0	0	0	0	3	56	35.20
North Carolina	8	321.97	205	10	17	4	159	40	60	39.02
South Carolina	4	60.16	72	0	0	3	0	9	9	32.70
Tennessee	9	455.01	593	53	3	2	1	71	49	366.04
Western States										
Arizona	3	24.46	33	0	0	3	0	3	13	22.98
California	26	3,464.55	4,093	229	103	67	2,953	428	592	1,410.41
Colorado	9	342.70	366	127	9	2	220	86	46	69.70
Idaho	1	0	0	0	0	0	0	0	11	17.00
Kansas	15	431.47	268	23	14	66	29	38	121	166.69
Montana	8	705.15	105	14	50	35	1,430	32	5	3.50
Nebraska	4	183.88	452	20	3	1	1	67	54	42.49
North Dakota	3	25.54	42	1	0	0	0	9	4	4.95
Oklahoma	11	378.84	231	27	19	83	67	34	140	177.79
Oregon	5	684.73	609	76	24	4	481	116	62	71.40
South Dakota	1	0	0	0	0	0	0	0	27	574.28
Texas	22	1,025.84	1,314	46	5	28	16	142	295	399.88
Utah	7	472.45	262	60	14	4	344	58	27	78.94
Washington	18	1,293.08	936	64	47	203	128	69	135	279.71
Wyoming	1	0	0	0	0	0	0	0	9	28.50
U. S. Total	671	42,431.40	66,767	7,001	945	1,828	11,342	8,724	11,854	23,885.76
U. S. Possessions	5	125.39	268	0	1	29	0	25	98	67.78
Canada	57	2,505.86	3,831	368	65	244	469	449	499	983.76
Grand Total	733*	45,062.65	70,866	7,369	1,011	2,101	11,811	9,198	12,451	24,937.30

*Includes 55 companies which now operate only buses.

FIGURES presented in this table are based on reports received by ELECTRIC RAILWAY JOURNAL during December, 1929, from companies representing more than 97 per cent of the total electrified track mileage of the United States and Canada, supplemented by reports previously received from other companies. The number of companies shown is the number of actual operating companies and does not include subsidiaries whose physical property has been absorbed by merger, etc., nor holding companies which do not operate under their own names. Track mileage and equipment data of interstate companies are listed according to the actual location of track. In addition to the number of cars shown in this table there are in the United States and Canada a total of 3,374 miscellaneous cars which have not been listed by states.

116 to 101. Furthermore, with the automobile registration standing at virtually one for every five people, little additional competition from this source is likely, and an increase in the riding habit on account of the difficulty of operating motor vehicles in the modern city may be looked for from now on.

Readjustment of Fares Has Been Gradual

While it is not possible to make a complete analysis of the fare situation in a review of this nature, the trend of fares in the past thirteen years can be seen clearly in Fig. 8. Before the war practically all the city companies had a basic 5-cent cash fare, frequently supplemented with reduced rate tickets. By 1917, when the chart begins, 271 out of the 297 companies included still had the 5-cent base charge. One had zone fares, 24 had 6-cent cash fares, and the remaining company 7 cents. In the next year many companies went to 6

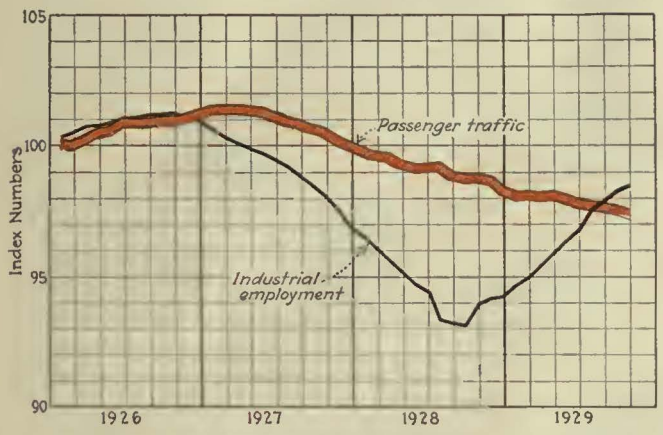


Fig. 6—Trends of passenger traffic and industrial employment in the United States

Passenger traffic is from data reported by 201 companies to the A.E.R.A., and the data on employment from the U. S. Bureau of Labor Statistics.

cents, several to 7 cents, and a few to 8 cents. The 10-cent cash fare appeared in 1919 and the 9-cent fare in 1920. In that year all but 64 of the companies had obtained a cash fare higher than 5 cents. The succeeding years have seen the growth of the 10-cent base rate and a still further reduction of the 5-cent fare, as at the end of 1929 only 33 companies retained the low rate. The 6-cent fare also has fallen from popularity, being confined to 13 properties. Seven cents is charged on 56 systems, 8 cents on 44, 9 cents on only one and 10 cents on 126, while zone fares are in use on 24 systems. Attention should be called to the fact that reduced rate fares of one form or another are in use on a considerable number of the companies included in the chart, which would reduce the average fare considerably. On the contrary, no bus fares are included. Since in the majority of instances the bus fares are higher than the street car fares the number of higher rate companies would be augmented if they were included.

Industry Statistics Presented

Statistics of the industry have been compiled by this paper, and are presented in the table on page 6. The figures have been obtained from a canvass of the individual companies, supplemented by information previously published in the McGraw Electric Railway Directory. The new information, however, covers more

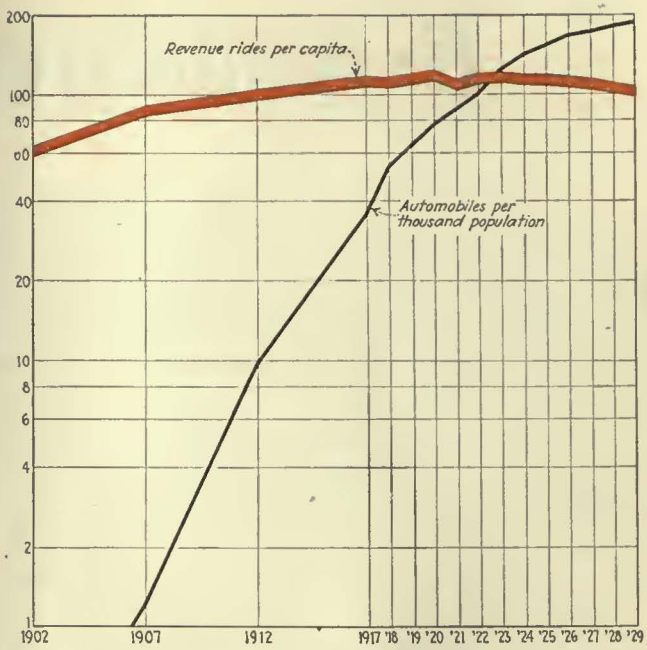


Fig. 7—Effect of private automobiles on passenger transportation in the United States

Electric railway traffic figures for 1917 and 1922 are from the U. S. Census, the remainder are A.E.R.A. estimates. The passenger automobile registrations are supplied by the National Automobile Chamber of Commerce.

than 97 per cent of the systems of the United States and Canada. It may be accepted as the best available information extant.

At the beginning of this year there are 671 operating electric railways in the United States. They have 42,431 miles of track and approximately 24,000 miles of bus routes. The number of cars owned includes 73,768 passenger cars, 945 electric locomotives, 13,170 freight cars, and about 12,000 service and miscellaneous cars. In addition these companies or their subsidiaries own nearly 12,000 buses.

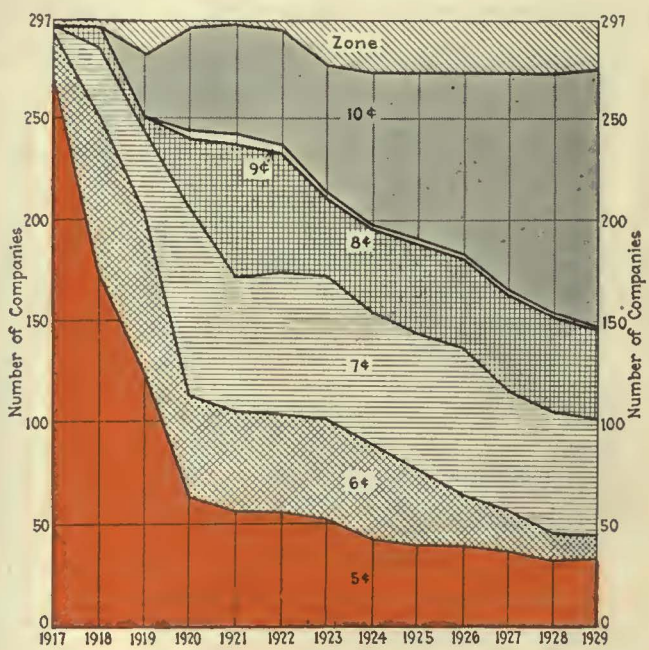


Fig. 8—Distribution and trend of fares of electric railways

Based on 297 companies operating in 280 cities of the United States having a population of 25,000 or more, as reported to the American Electric Railway Association.

Expenditures for Improvements

Budget increase in 1929 exceeded that of 1928, reflecting continued betterment of railways' financial condition. Rolling stock expenditures show greatest increase. Both maintenance material and labor totals rise. Estimates for 1930 forecast further increases.

CONTINUING the upward climb which started in the year of 1928, following the low ebb of 1927, the total expenditures for new plant and equipment and maintenance materials in the electric railway industry in 1929 again exceeded those for the preceding year. Moreover, it is noteworthy that the expenditures of 1930 will exceed those of 1929 by an even greater margin. During the years 1925, 1926 and 1927 the totals receded steadily. The figure for 1927, however, represented a smaller decrease than attended the previous figures and it was predicted at the time that the next year would show a slight increase and the following years slightly greater increases. This trend has been borne out, not only for 1928 and again for 1929, but also in the forecast for the new year, 1930. From $225,271,000 for 1927 to $225,730,000 in 1928 and to $236,005,000 for 1929 are the actual figures. $459,000 and $10,275,000 are the increases for the respective years. Budgets for 1930 submitted by the electric railways indicate that the total will soar to $251,530,000, representing an increase of $15,525,000 or 6.58 per cent.

In view of the somewhat disturbed condition of general business brought about by the recent market crash, the figures of 1929 and the forecast of 1930, both showing increases, are of real significance. They emphasize again the fundamental stability of the electric railway industry and its relative immunity to fluctuations in trade. Expenditures for the past year were not curtailed in any instance and most of the electric railways reporting showed increases for 1930. In a survey made by the American Electric Railway Association for President Hoover the railways reported the same plans. It was stated in the association's announcement, following the survey that the railways would spend more than $1,000,000 a day for equipment and various construction activities in 1930. Actual figures show that the total amount will be $371,220,000, representing $149,050,000 for new plant and equipment, $102,480,000 for maintenance materials and $119,690,000 for maintenance labor.

As mentioned in the interpretation of the budget figures last year, the electric railways had been planning extensive improvement programs for some time, but hesitated in carrying them through because of trifling uncertainties. With the great improvements in car design of the past few years and the reassurance that local transportation cannot be dispensed with, many properties have gone ahead with rehabilitation plans. It was stated last year that the purchasing power of the industry was rapidly being restored and that a steady climb could reasonably be looked for in the following years. This forecast was borne out in 1929 and in the budgets for 1930.

Perhaps the outstanding trend indicated by the figures, aside from the continued climb in the total, is

Purchases Planned by Electric Railways for 1930, Compared with Actual Figures for Past Years Compiled by "Electric Railway Journal"

New Plant and Equipment—Capital

	1925	1926	1927	1928	1929	Forecast 1930
Way and structures	$52,400,000	$51,200,000	$77,365,000	$90,050,000	$81,890,000	$88,400,000
Cars	50,400,000	40,000,000	34,758,000	18,900,000	28,710,000	31,800,000
Buses	15,680,000	17,540,000	14,368,000	19,100,000	17,300,000	19,900,000
Power equipment	5,150,000	7,640,000	3,561,000	7,300,000	7,570,000	8,950,000
Total	$123,630,000	$116,380,000	$130,052,000	$135,350,000	$135,470,000	$149,050,000

Maintenance Materials—Operating

Way and structures	$56,900,000	$50,000,000	$40,517,000	$31,040,000	$35,800,000	$35,790,000
Cars	54,700,000	47,800,000	36,941,000	35,200,000	36,350,000	36,520,000
Buses	7,370,000	7,500,000	9,451,000	15,040,000	17,925,000	19,650,000
Power equipment	22,650,000	11,370,000	8,310,000	9,100,000	10,460,000	10,520,000
Total	$141,620,000	$116,670,000	$95,219,000	$90,380,000	$100,535,000	$102,480,000

Total of New Plant and Equipment, and Maintenance Materials

Way and structures	$109,300,000	$101,200,000	$117,882,000	$121,090,000	$117,690,000	$124,190,000
Cars	105,100,000	87,800,000	71,699,000	54,100,000	65,060,000	68,320,000
Buses	23,050,000	25,040,000	23,819,000	34,140,000	35,225,000	39,550,000
Power equipment	27,800,000	19,010,000	11,871,000	16,400,000	18,030,000	19,470,000
Grand total	$265,250,000	$233,050,000	$225,271,000	$225,730,000	$236,005,000	$251,530,000

Mount Upward

By
CLIFFORD A. FAUST
Assistant Editor *Electric Railway Journal*

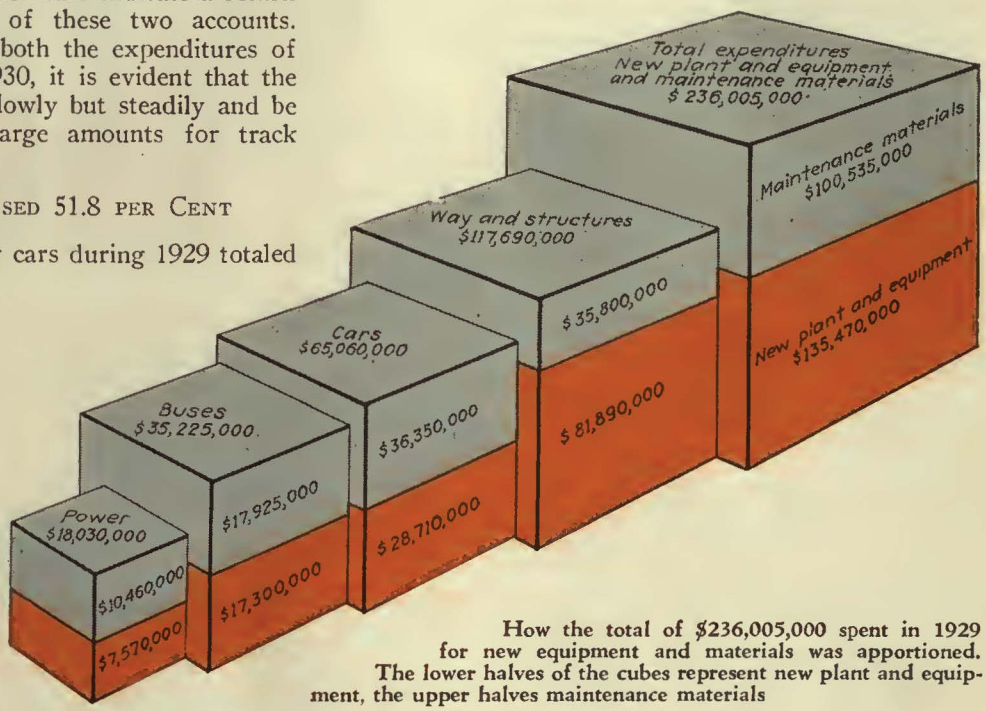
the buying movement in rolling stock, following and now accompanying a period of great track activity. Last year's low mark of $18,900,000 for cars and the high mark of $90,050,000 for way and structures indicated that operators were preparing for the extensive purchase of new equipment by conditioning their track. Their budgets submitted a year ago also showed the same trend, giving an estimate of approximately $30,000,000 for cars in 1929 and slightly under $80,000,000 for way and structures. Actual expenditures in 1929 of $28,710,000 for cars and $81,890,000 for way and structures bear out the trend as foreseen. The predicted increases of 7.95 per cent for way and structures and 10.76 per cent for cars indicate a return to normalcy in the relation of these two accounts. Surveying the past trends in both the expenditures of 1929 and the forecasts for 1930, it is evident that the buying of cars will increase slowly but steadily and be accompanied by reasonably large amounts for track reconstruction.

Car Purchases Increased 51.8 per Cent

Actual expenditures for new cars during 1929 totaled $28,710,000, an increase of $9,810,000, or 51.8 per cent, over 1928. Definite information received last year indicated that several large orders for car equipment would be placed. All of these and several others were placed during the year. Among the outstanding orders of the year were 300 subway cars for the City of New York, 141 suburban motor cars for the Delaware, Lackawanna & Western Railroad, 106 for the Cleveland Railway, 101 for the City of Detroit, 101 for the Brooklyn & Manhattan Transit Corporation, 100 for the Chicago Surface Lines, 50 for the Montreal Tramways and 25 for the Market Street Railway. Other large orders were 42 locomotives for the New York Central Railroad and 22 heavy passenger locomotives for the Cleveland Union Terminals Company. Total orders of new equipment for the year were 77 electric locomotives and approximately 1,400 cars, including freight, express and service cars.

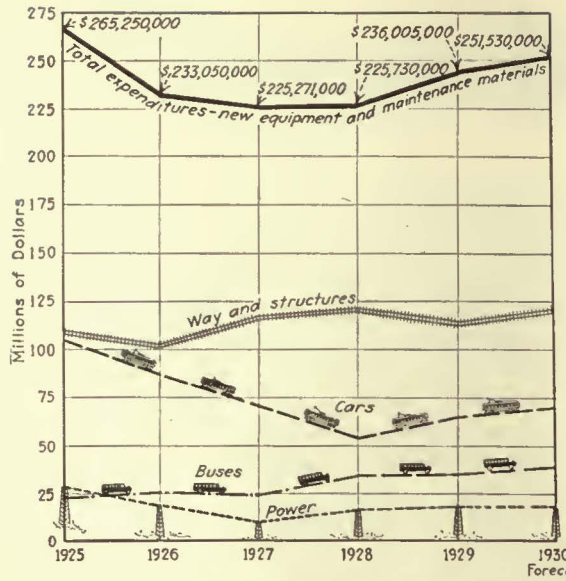
That the large number of cars purchased in 1929 is not an unusual number is indicated in the budgets of 1930, which show that cars purchased in that year will even exceed in value those of 1929. Definite orders totaling 522 were shown on the budgets submitted. Of this number 417 will be ordered by nine companies in lots of 135, 66, 60, 50, 32, 23, 20, 16 and 15, respectively. An important evident trend is that many of the smaller companies will order cars in 1930, increasing their percentage which in the past years has not been very high. In view of the fact that the smaller cities are having more difficulty than the larger ones this is particularly encouraging. Although no definite announcements have been made of large orders for rapid transit or steam road electrification equipment, it is not unlikely that at least one or two such orders will be placed. Considering the low figure for 1928, when car purchases were at an ebb, there is much reason for optimism with the present outlook. It appears that the extensive experimentation and development of modern equipment, which delayed car purchases for a time, will be rewarded in a normal resumption of buying.

As forecast a year ago the expenditures for way and structures, charged to capital accounts, showed a recession in 1929. The total dropped from $90,050,000 to $81,890,000, a comparatively small amount considering the large increase in car purchases. It also should be remembered that the figure for 1928 was a high mark for this account, since these figures were first compiled in 1923, and that the 1929 figure of $81,890,000 exceeds all other totals except the one for 1928. That this activity in track is to continue is indicated in the forecast for 1930 of $88,400,000, an increase of $6,510,000. No doubt the way and structures account will continue to exceed the $80,000,000 mark in succeeding years.



How the total of $236,005,000 spent in 1929 for new equipment and materials was apportioned. The lower halves of the cubes represent new plant and equipment, the upper halves maintenance materials

During the past year more than 700 miles of track was rebuilt, over 165 miles of track extension was made and approximately 200 miles of steam railroad lines was electrified. These figures compare with slightly more than 890 miles of rebuilt track in 1928 and 230 miles of extensions. Structures, of course, account for an appreciable percentage of the total way



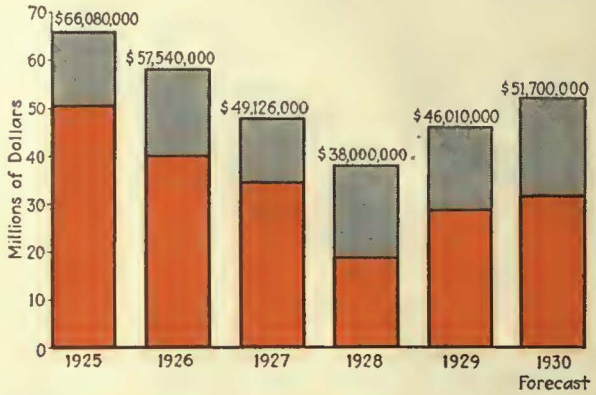
Distribution by individual accounts of new plant and equipment and maintenance materials, for the years 1925 to 1929, inclusive, and the forecasts for 1930. Note the upward turn following 1927

and structures figure. Since structures and track are not segregated on the budget blanks it is impossible to give the exact proportions of the two.

As mentioned previously, way and structures will total $88,400,000 in 1930. It was definitely indicated on the budget blanks that 22 companies would alone expend $17,110,000 for this account. Representing the larger programs, five companies will spend a total of $9,000,000, in amounts of $3,000,000, $2,500,000, $1,300,000, $1,200,000 and $1,000,000. Seven programs under $1,000,000, totaling $4,942,000, are $889,000, $800,000, $700,000, $685,000, $655,000, $633,000 and $580,000. Ten smaller programs, totaling $3,168,000, are $487,000, $466,000, $367,000, $350,000, $349,000, $261,000, $250,000, $229,000, $209,000 and $200,000. These programs in many instances are accompanying large orders for equipment. Others are probably the forerunners of rolling stock buying, just as many orders of 1929 followed the extensive track rehabilitation in 1928.

Falling slightly short of the high mark for buses in 1928, but practically equaling the second highest mark for 1926, expenditures for new buses during 1929 totaled $17,300,000. This figure compares with $19,100,000 for 1928, $14,368,000 in 1927 and $17,540,000 for 1926. The actual number of new buses bought totaled more than 1,800 in 1929 as compared with approximately 2,100 in 1928. An increase of $2,600,000, however, is forecast by the electric railways for 1930. This increase, together with increases of practically the same percentages in the other three capital accounts indicates a steady and normal expansion in every department.

Adding 1,800 new buses during 1929 brings the total now being operated by electric railways to more than 12,400. Since a large number of these have been in service for more than five years a considerable proportion of the buses bought this year were for replacement. This proportion should increase in the following years. With the steady expansion which has characterized this type of service since it was first adopted by the electric railways, and the ever-increasing number for replacement, the sales should continue to be high. In one or two more years the number of buses for replacement actually should exceed the numbers purchased in the years of its expansion.



Combined values of cars and buses bought during 1925-1929 and the forecasts for 1930. The lower portions represent cars, the upper portions buses. The 1929 and 1930 figures indicate a pronounced climb from the low point of 1927

In 1928 the total figure for cars and buses reached a low mark at $38,000,000. This followed similar decreases in the previous years, the total for 1925 being $66,080,000, that for 1926 being $57,540,000 and that for 1927 being $49,126,000. It was predicted in pre-

Maintenance Materials and Labor

		Way and Structures	Cars	Buses*	Power	Total
1927 Expenditures	Material	$40,517,000	$36,941,000	$9,451,000	$8,310,000	$95,219,000
	Labor	66,874,000	44,952,000	6,592,000	8,244,000	126,662,000
	Total	$107,391,000	$81,893,000	$16,043,000	$16,554,000	$221,881,000
1928 Expenditures	Material	$31,040,000	$35,200,000	$15,040,000	$9,100,000	$90,380,000
	Labor	50,400,000	49,300,000	11,870,000	6,580,000	118,150,000
	Total	$81,440,000	$84,500,000	$26,910,000	$15,680,000	$208,530,000
1929 Expenditures	Material	$35,800,000	$36,350,000	$17,925,000	$10,460,000	$100,535,000
	Labor	52,800,000	49,380,000	13,540,000	5,730,000	121,450,000
	Total	$88,600,000	$85,730,000	$31,465,000	$16,190,000	$221,985,000
1930 Estimated expenditures	Material	$35,790,000	$36,520,000	$19,650,000	$10,520,000	$102,480,000
	Labor	51,360,000	50,200,000	12,470,000	5,660,000	119,690,000
	Total	$87,150,000	$86,720,000	$32,120,000	$16,180,000	$222,170,000

*Bus maintenance materials include replacement parts, tires and tubes.

	1929	Forecast 1930
Bus operating supplies, including fuel and lubricants	$20,720,000	$22,510,000

vious articles that 1928 would be the low year, and it was. Mounting to $46,010,000 the total for 1929 exceeded that for 1928 by $8,010,000 and almost reached the combined figure for 1927. It is of particular significance that the total for cars and buses in 1930 will continue to climb, reaching $51,700,000. This figure will be an increase of $5,690,000 over 1929 and will exceed the totals for the three previous years.

Expenditures for new power equipment in 1929 were $7,570,000, exceeding the 1928 figure by $270,000. Because of several rather extensive programs being planned and under way the total for 1930 will amount to $8,950,000. Among the larger expenditures for new power equipment of the past year were those for the Cleveland Union Terminal electrification and the Lackawanna project.

Following a slight recession in the year 1928 the total of maintenance materials, charged to operating accounts, showed an increase of $10,155,000, or 11.2 per cent. All of the accounts showed increases, the first time since these figures have been compiled. The new total was $100,535,000, compared with $90,380,000 for 1928. Way and structures showed an increase of $4,700,000; cars, $1,150,000; buses, $2,885,000; and power equipment, $1,360,000. The way and structures increase is accounted for in the increased expenditure in track maintenance accompanying the decreased amount of track reconstruction. During 1928, when the new plant and equipment for way and structures showed a large increase, the maintenance materials dropped. In 1929 the two accounts were reversed, the capital account showing a decrease and maintenance an increase. During 1930 maintenance materials for way and structures will remain practically the same, varying only $10,000.

One of the most encouraging results of all the maintenance figures is the increase shown in maintenance materials for cars. From the time these figures were first compiled car maintenance materials have decreased each year. Although the increase shown in 1929 is not a very large one it does indicate that the downward turn has been stemmed. The decrease in 1928 was much smaller than in any previous year, which indicated that no doubt the low point would be reached in the first part of 1929 and then go upward. The actual total for 1929 and the forecast for 1930, showing another increase, proved that this theory was true.

Exceeding the previous high mark of $15,040,000 by $2,885,000 the 1929 total of bus maintenance materials reach a new high mark at $17,925,000. This figure includes replacement parts, tires and tubes, but not fuel and lubricants. Bus maintenance materials have shown a steady climb, the increases being almost in direct proportion with the number of buses being used by the electric railways. During 1930 the total will again increase, reaching $19,650,000.

Bus operating supplies, including fuel and lubricants, totaled $20,720,000 for the year. This figure is the first one obtained on the budget blanks, so that no comparison can be made with previous years. However, this figure should increase more nearly in proportion with the number of buses in operation than the maintenance materials. In 1930 this account will increase to $22,510,000. It is interesting to note that fuel and lubricants actually exceed the cost of replacement parts, tires and tubes.

Maintenance materials for power equipment showed an increase of $1,360,000, reaching the figure of $10,460,000. In 1930 materials for power plant, substation and line maintenance will show another increase. It appears from the figures for the past three years and the forecast for 1930 that this account will vary but little each year.

With the exception of power all departments showed an increase in 1929 of expenditures for maintenance labor. Way and structures showed an increase of $2,400,000, cars an increase of $80,000, and buses one of $1,670,000. These increases brought the total for maintenance materials for 1929 up to $121,450,000, an increase of $3,300,000. The most consistent increases are shown by buses, this account mounting from $6,592,000 in 1927 to $11,870,000 in 1928 and $13,540,000 in 1929. The forecasts for 1930 indicate that maintenance labor for every account will remain practically the same.

Because all of the maintenance material accounts showed increases in 1929 over 1928 and maintenance labor varied little, the combined total for both maintenance materials and labor showed an increase. From the previous figure of $208,530,000 the total mounted to $221,985,000. The combined total for 1930 is set by the industry at $222,170,000. It is of real significance that the totals for each account increased. Maintenance figures ordinarily do not fluctuate because maintenance practices on individual properties do not vary much within a period of twelve months. Increases in every account, therefore, can only indicate that the railways are bettering their standards of maintenance.

In the article of last year the percentages were computed of maintenance materials to the total of materials and labor. Budgets for 1929 indicated that the percentages were practically the same as for 1928, being 40.3 for way and structures, 41.2 for cars, 57.0 for buses, 64.5 for power and 45.3 for the total.

Outstanding Facts Revealed by the Budget Data

DURING 1929

The total for new plant and equipment and maintenance materials showed an increase of $10,275,000.

Car purchases totaled $28,710,000, an increase of $9,810,000, or 51.8 per cent.

Power equipment expenditures for both new plant and maintenance material increased.

Total maintenance materials increased from $90,380,000 to $100,535,000.

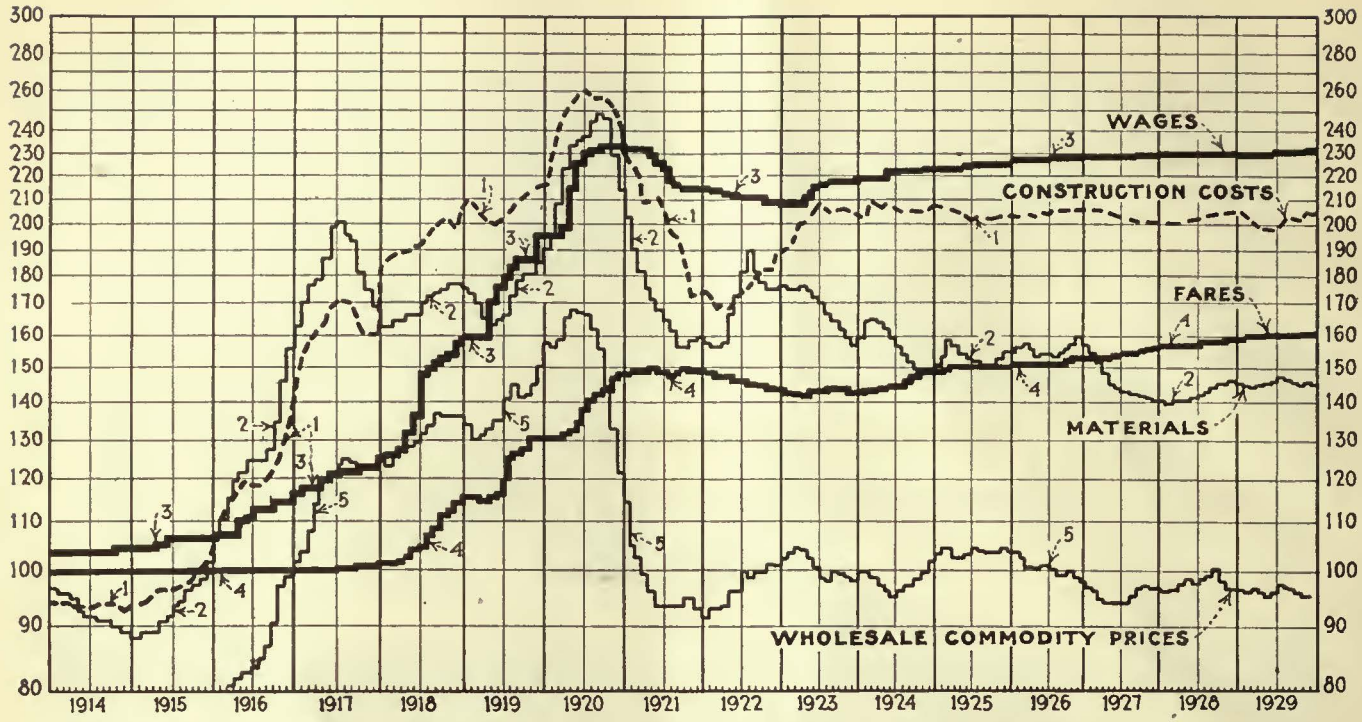
DURING 1930

The total of all expenditures for new equipment and maintenance materials will increase more than in 1929, reaching the mark of $251,530,000.

Car purchases will again be high and will exceed those of 1929.

Both buses and power equipment will increase.

Maintenance materials and labor will not vary much from the 1929 figures.



Trend of Construction and Operating Costs, Wages and Fares, 1914-1929

1. Electric railway construction costs (according to American Electric Railway Association).

2. Electric railway operating materials costs (Richey). Includes fuel for power, weighted according to average use in maintenance and operation.

3. Electric railway wages (Richey). Maximum hourly wages of platform men, weighted according to number of men.

4. Street railway fares (Richey). U. S. cities (except New York), weighted according to population.

5. Wholesale commodity prices (U. S. Bureau of Labor Statistics).

AVERAGE FARES AND COSTS 1913-1929

Base 1913 = 100

	Street Railway Fares (Richey)	Elec. Ry. Operating Materials Costs (Richey)	Electric Railway Wages (Richey)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	General Construction Costs (*Eng. News-Record*)	Wholesale Prices, All Commodities* (U. S. Bur. Lab. Stat.)
1913.....	100.0	100.0	100.0	100.0	100.0	69.8
1914.....	100.0	92.6	104.2	94.0	88.6	68.1
1915.....	100.1	93.5	106.2	97.3	92.6	69.5
1916.....	100.1	126.2	111.6	119.8	129.6	85.5
1917.....	100.5	181.9	120.6	162.7	181.2	117.5
1918.....	106.2	168.8	140.5	192.5	189.2	131.3
1919.....	120.7	172.2	174.0	205.1	198.4	138.6
1920.....	137.2	224.6	217.3	244.7	251.3	154.4
1921.....	148.9	169.9	222.7	200.7	201.8	97.6
1922.....	146.0	170.0	210.0	175.2	174.4	96.7
1923.....	142.9	168.0	212.1	200.2	214.1	100.6
1924.....	149.2	156.0	219.2	204.6	215.4	98.1
1925.....	150.2	153.1	222.2	202.4	206.7	103.5
1926.....	152.2	155.0	225.3	202.6	208.0	100.0
1927.....	154.6	145.7	227.5	201.1	206.2	95.4
1928.....	157.7	142.2	229.3	203.1	206.8	97.6
1929.....	160.2	145.6	230.6	202.4	207.0	.....

*Base 1926 = 100.

MONTHLY INDEX OF FARES AND COSTS FOR PAST FOUR YEARS

Base 1913 = 100

1926	Street Railway Farea (Richey)	Elec. Ry. Operating Materials Costs (Richey)	Electric Railway Wages (Richey)	Elec. Ry. Construction Costs (Am. Elec. Ry. Assn.)	General Construction Costs (*Eng. News-Record*)	Wholesale Prices, All Commodities* (U. S. Bur. Lab. Stat.)
January....	151.2	154.3	223.8	202.2	207.2	103.6
February...	151.8	155.3	223.8	201.9	206.6	102.1
March.....	151.9	156.4	224.1	202.0	207.6	100.4
April.....	151.9	154.2	224.7	201.3	207.0	100.1
May.....	151.9	153.1	225.4	202.4	207.3	100.5
June.....	152.1	154.4	225.5	201.9	204.8	100.5
July.....	152.0	154.1	225.7	203.2	207.8	99.5
August.....	152.0	153.1	225.9	203.6	208.3	99.0
September..	512.0	154.2	226.1	203.2	208.3	99.7
October....	152.8	155.4	226.2	202.9	209.8	99.4
November..	153.2	156.6	226.3	203.7	210.8	98.4
December..	153.2	159.2	226.3	203.2	210.8	97.9
1927						
January....	153.2	156.0	226.6	203.5	211.5	96.6
February...	153.8	154.0	226.7	202.9	210.2	95.9
March.....	153.4	152.1	226.7	203.0	208.8	94.5
April.....	153.4	148.0	226.9	202.6	209.0	93.7
May.....	153.6	144.2	227.4	201.0	206.8	93.7
June.....	153.6	143.0	227.5	200.6	205.6	93.8
July.....	155.2	142.9	227.8	199.9	203.7	94.1
August.....	155.3	142.1	227.9	200.9	205.5	95.2
September..	155.5	141.6	228.0	199.4	203.6	96.5
October....	155.7	141.8	228.2	199.8	204.4	97.0
November..	156.1	141.3	228.3	199.4	202.0	96.7
December..	156.2	140.6	228.4	200.7	203.9	96.8
1928						
January....	156.7	140.6	228.6	200.9	203.9	96.3
February...	156.7	139.5	228.7	200.9	204.6	96.4
March.....	157.2	140.1	228.8	200.5	204.6	96.0
April.....	157.2	140.0	228.8	201.2	206.4	97.4
May.....	157.3	140.4	229.2	201.9	207.0	98.6
June.....	157.3	141.4	229.2	202.7	206.2	97.6
July.....	157.7	141.8	229.2	203.3	206.6	98.3
August.....	158.0	142.5	229.7	204.5	207.3	98.9
September..	158.1	144.2	229.7	204.4	207.3	100.1
October....	158.2	144.9	229.9	205.5	207.7	97.8
November..	158.9	145.1	229.9	205.7	209.5	96.7
December..	159.3	145.5	229.8	205.1	210.2	96.7
1929						
January....	159.3	145.3	229.9	204.5	209.4	97.2
February...	160.0	145.0	229.9	205.2	210.4	96.7
March.....	160.0	144.8	230.1	203.4	207.8	97.5
April.....	160.0	145.0	230.1	200.9	203.4	96.8
May.....	160.2	145.5	230.1	199.5	205.2	95.8
June.....	160.3	145.8	230.8	199.7	205.6	96.4
July.....	160.3	147.5	230.8	199.0	204.8	98.0
August.....	160.3	146.4	231.0	200.8	205.9	97.7
September..	160.3	146.1	231.0	203.4	207.6	97.5
October....	160.3	145.6	231.1	203.0	206.3	96.3
November..	160.6	145.7	231.1	204.8	208.5	94.4
December..	160.6	144.9	231.1	205.1	209.5	.....

*Base 1926 = 100.

Electric Railway

Fares and wages continue to increase, but in a smaller measure than during 1928 and 1927. Commodity prices and construction costs maintain a level practically the same as during the past three years

Costs and Fares in 1929

By
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Worcester, Mass.

FOR several years past the ELECTRIC RAILWAY JOURNAL has published monthly in its financial and corporate section a series of index numbers compiled by the writer under the heading of "Conspectus of Indexes." This conspectus is made up of indexes showing the trends of street railway fares and of the costs of electric railway wages and materials entering into electric railway operation; costs of construction, both electric railway and general; wholesale commodities in general; retail food; cost of living, and some others. In the annual statistical numbers of the JOURNAL, the first issue in January each year, beginning in 1923, charts and tables have been presented showing the trend since 1913 of the most important of these indexes as affecting electric railway operation. In Fig. 7 herewith is shown a similar chart indicating the trend of five of these indexes from January, 1914, through the latest available figures for 1929. The indexes there shown are: (1) Electric Railway Construction Costs, as computed by the formula of the American Electric Railway Association; (2) Electric Railway Operating Materials Costs, including fuel for power; (3) Electric Railway Wages; (4) Street Railway Fares; (5) Wholesale Prices of All Commodities, as computed by the U. S. Bureau of Labor Statistics.

The methods used in the computation of these five indexes were described fully on page 37 of the JOURNAL for Jan. 2, 1926, in an article which also contained a tabulation showing the numerical values of the various indexes monthly from January, 1920, through December, 1925. The earlier monthly numerical values, from January, 1914, through December, 1919, may be found on page 19 of the Journal for Jan. 5, 1924. A tabulation herewith shows the numerical value of six of the indexes yearly from 1913 through 1929, and monthly beginning with January, 1926, and these six indexes also are shown graphically for the past four years on a somewhat larger scale than in Fig. 7 by the charts Figs. 1 to 6, inclusive.

The weighted average street railway fare, as shown by the Richey index in Fig. 1, has increased during 1929 from 7.71 cents to 7.78 cents, an increase of 0.8 per cent during the year. This is a slowing up of the rate of increase in the average fare, as this index showed a 2 per cent gain in 1928 following a 2 per cent gain in 1927. Ten of the 143 cities which affect this index reported increases in street railway fares during 1929, the most important of these increases being in Louisville, Minneapolis and St. Paul. Other changes were of less importance as affecting the index, either on account of the smallness of the changes or the relatively small population involved. It will be noted that the index of the American Electric Railway Association, which is also shown in Fig. 1, shows not only a higher average

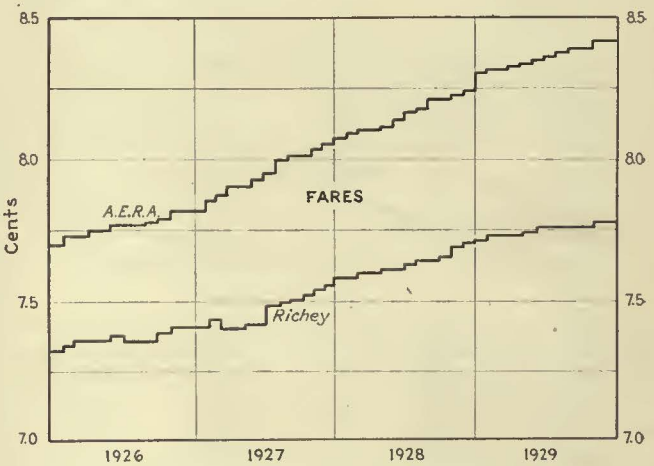


Fig. 1—Street Railway Fares (1913 = 4.8425 cents)

fare, but a slightly greater increase in the average than does the Richey index. This is on account of the fact that the American Electric Railway Association Fare Index includes all cities of more than 25,000 population, is an average of cash fares only, and is not a weighted average, so that each city is of equal importance in the final average regardless of its size or the number of passengers affected by the fare. On the other hand, the Richey index includes only cities of more than 50,000 population (excluding New York City), and in computing the average the fares are weighted in accordance

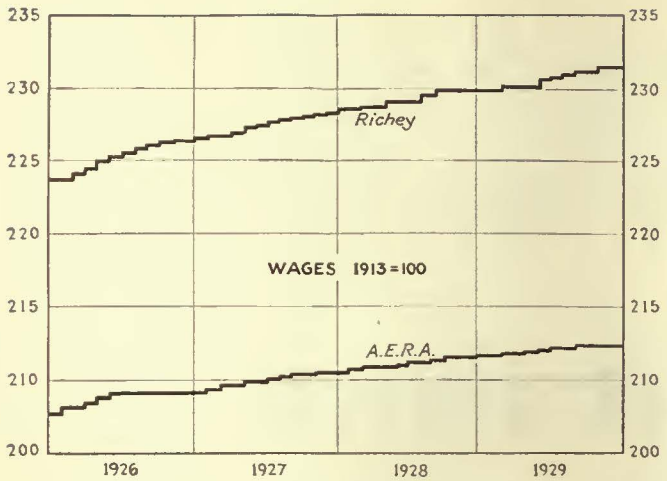


Fig. 2—Electric Railway Wages

with the populations of the cities; further, for each city where reduced rate tickets are used consideration is given to both cash and ticket rates, except that children's or workmen's tickets or other forms of special reduced rates are not included.

Electric railway wages, as shown by the indexes in Fig. 2, have continued the gradual upward trend which started in 1923. The Richey index which includes wages on 130 street and interurban railways, weighted in accordance with the number of trainmen employed on such railways, shows an increase of about 0.6 per cent during 1929 and now stands at 231. The principal increases in wages have been in Chicago, St. Louis, Indianapolis, Cincinnati, Louisville, Ft. Wayne, Toledo, Wilmington and Memphis, these cities being named in the order of the effect of the 1929 wage change on the index. The American Electric Railway Association Wage Index uses wages on 85 railways and is unweighted with respect

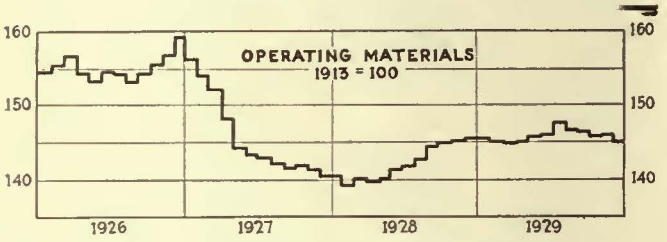


Fig. 3—Electric Railway Operating Materials

to the number of men employed. Both indexes indicate about the same measure of increase in trainmen's wages during the past four years.

A computation of an index of "real wages" of electric railway trainmen as compared with 1913 and 1914 may be made by dividing the index of wages by the index of the cost of living. This indicates an index of "real wages" (on the base of 1913-14) of 141.5 at the end of 1929, which may be compared with 141 at the end of 1928 and 138 at the end of 1927. Such increases in the "real wages" index for street railway employees show their steadily increasing opportunity to better their standard of living.

The cost of electric railway operating materials was maintained at a fairly uniform level during 1929. This index, as shown by Fig. 3, declined from a high of 159 in December, 1926, to a low of 139.5 in February, 1928, and recovered to practically its present level by November, 1928. It should be borne in mind that in the make-up of this index, fuel for power enters into it with a weighting of 40 per cent.

Electric railway construction costs have remained very steadily at about their present level since the middle of 1923, as indicated by the American Electric Railway Association Construction Cost Index, shown on page 12

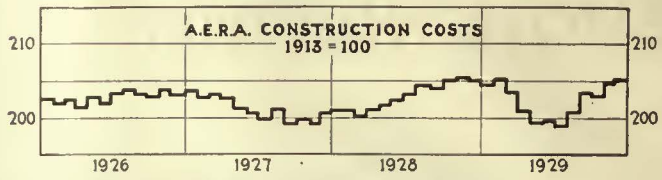


Fig. 4—A.E.R.A. Electric Railway Construction Costs

and on a larger scale for the past four years in Fig. 4. This index of electric railway construction costs may be compared with the general construction cost index of the *Engineering News-Record,* which is shown in Fig. 5 for the past four years. The latter includes structural steel and other building materials in a considerably greater weighting than such materials are used in the Electric Railway Construction Cost Index, which is

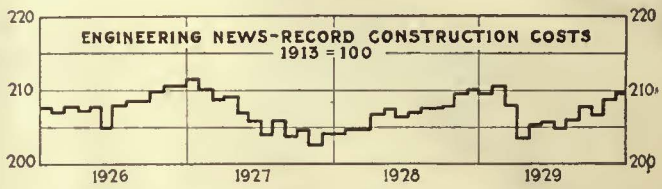


Fig. 5—Engineering News-Record Construction Costs

somewhat stabilized by the heavier weighting of steel rail, the price of which has remained constant since October, 1922. The Electric Railway Construction Cost Index has, however, a heavier weighting of the common labor rate, which started the year at about 56 cents, dropped to 53 cents during the summer months, and has recovered to 56½ cents at the end of the year.

The Wholesale Commodity Index of the United States Bureau of Labor Statistics is shown for the past four years in Fig. 6, and from 1916 on in the large chart. Its level during 1929 has been not greatly different from that of 1928. This index is the only one of those presented here which has a base other than the year 1913. The base of 1913 = 100 for the Wholesale Commodity Index was discontinued in August, 1927, and since then it has been calculated on the base of 1926 = 100 and is so shown in the accompanying tables and charts.

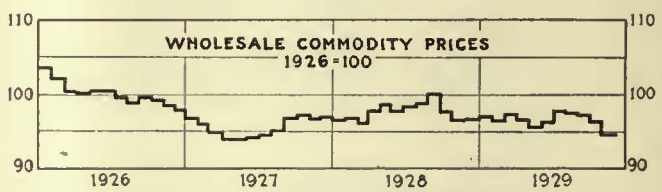


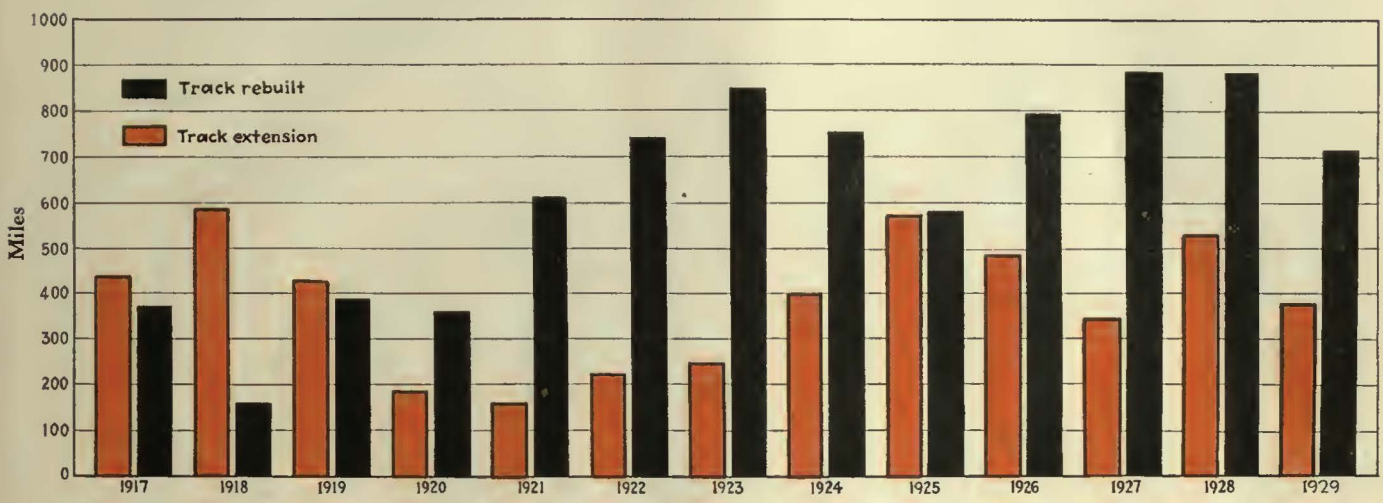
Fig. 6—Bureau of Labor Statistics Wholesale Commodity Prices

Favorable indications in the index figures are the even trends of prices for several years, continuing through 1929, along with an increase in fares. The only disturbing element is the uptrend of wages, making them an increasing item in operating cost. Otherwise all the indications for the coming year are favorable.

Industry Strengthened by

Trackage Readjustment

By
JOHN A. MILLER, JR.
Managing Editor
Electric Railway Journal



Summary of track extensions and reconstructions since 1917

Survey of changes which have occurred during past ten years shows that extensions made by electric railways have largely offset abandonments of unprofitable lines. Despite the steady growth of bus operation the net decrease in electric trackage has been less than 10 per cent. Mileage of extensions and also of abandonments decreased in 1929 as compared with 1928. Volume of track reconstruction continued large on both urban and interurban properties

Comparison of Track Construction by Years

Year	Track Extensions Number of Companies	Track Extensions Miles	Track Rebuilt Number of Companies	Track Rebuilt Miles	Electrified Steam Lines Miles
1908	157	1,174.5	(a)	(a)	84.00
1909	160	774.7	(a)	(a)	112.40
1910	217	1,204.8	(a)	(a)	192.40
1911	223	1,105.0	(a)	(a)	86.50
1912	171	869.4	(a)	(a)	80.80
1913	181	974.9	(a)	(a)	119.00
1914	163	716.5	(a)	(a)	229.00
1915	136	596.0	(a)	(a)	448.20
1916	104	356.30	(a)	(a)	388.00
1917	121	376.70	150	375.40	66.00
1918	80	313.82	81	155.43	275.70
1919	73	140.57	148	389.89	287.60
1920	87	176.56	131	361.77	8.92
1921	78	147.10	184	615.21	8.08
1922	104	211.38	212	739.70	12.35
1923	132	233.15	241	854.63	26.12
1924	112	312.08	218	764.33	83.39
1925	100	339.79	179	578.90	236.36
1926	95	317.96	...	802.52	169.52
1927	95	192.41	212	887.94	140.70
1928	103	238.94	216	894.73	276.14
1929	81	167.71	190	700.14	204.85

(a) Information not available.

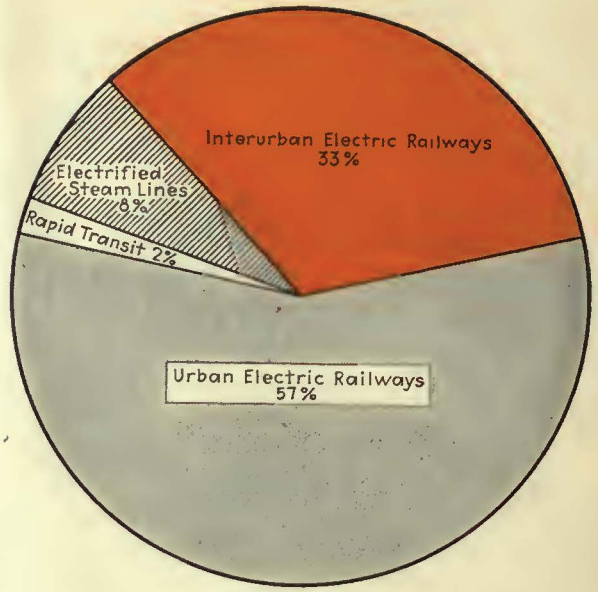
MANY changes in physical plant have been made by the electric railways in recent years to meet the changing transportation requirements of the public. Although somewhat smaller in extent, the changes which occurred in 1929 were similar in character to those of other recent years. During the past decade a considerable amount of track has been abandoned where operation proved unprofitable. At the same time the electric railways have been active in adding to their trackage in profitable territory. The net result of these changes has been a decrease of about 9½ per cent in the total electrified track mileage in the United States and Canada. Undoubtedly the readjustment of trackage by abandonments in some localities and extensions in others has greatly strengthened the position of the industry.

In all, approximately 1,050 miles of track was built or rebuilt in 1929. Extensions of electric trackage made during the year totaled nearly 380 miles. This total was divided almost equally between additions to the trackage of the local transportation systems and additions to the

electrified trackage of the steam railroads. Extensions made to rapid transit track mileage were relatively unimportant.

While the mileage of extensions made in 1929 was somewhat below that of the preceding year, it was slightly above the average for the past ten years. Since Jan. 1, 1920, the urban and interurban electric railways of the United States and Canada have added a total of 2,337.08 miles of track to their systems. Approximately 70 per cent of these extensions were made by the urban railways and 30 per cent by the interurbans. During the same period the steam railroads added 1,166.43 miles to their electrified trackage. Thus the total increase in electric railway track has been approximately 3,500 miles or an average of about 350 miles per year. The mileage of extensions is summarized by years in an accompanying table.

Some 80 electric railways made extensions to their trackage last year. Among the important additions reported by these companies are 16.48 miles built by the Department of Street Railways, Detroit, 11.52 miles by the Montreal Tramways, 10.94 miles by the Cleveland Railway, 10.45 miles by the Milwaukee Electric Railway & Light Company, 5.21 miles by the Pacific Electric Railway, 19.98 miles by the Sacramento Northern Railway, and 23.76 miles by the Oklahoma Railway. Numerous other extensions were made, ranging in length from a fraction of a mile to 5 miles. The complete list of extensions made in 1929 is tabulated below. A number of additions made to the electrified track mileage of the steam railroads are discussed in greater detail elsewhere in this issue.



Classification of electrified track mileage

Nearly 200 electric railways reported reconstruction of track during the year just ended. This is about the same number as in other recent years. In all, a total of more than 700 miles of track was rebuilt, of which approximately 475 miles was in paved street and 225 miles was open construction. The total figure for 1929 is slightly less than that for 1928, but about the same as the average for the past ten years. This decrease in

Track Extensions in 1929

Name of Company	Miles
Alabama	
Birmingham Elec. Co.	0.02
California	
Market St. Ry., San Francisco	0.30
Pacific Elec. Ry.	5.21
Peninsular Ry., San Jose	0.75
Sacramento Northern Ry.	19.98
Visalia Elec. R.R.	0.10
Connecticut	
Connecticut Company	1.80
Delaware	
Delaware Elec. Power Co.	0.29
Florida	
Miami Beach Ry.	0.48
Tampa Electric Co.	0.04
Illinois	
Calumet & South Chicago Ry.	0.14
Chicago, Aurora & Elgin R.R.	0.25
Chicago City Ry.	0.07
Chicago Rys.	0.23
Chicago, North Shore & Milwaukee R.R.	3.45
St. Louis & Belleville Elec. Ry.	0.41
Indiana	
Chicago, South Shore & South Bend R.R.	4.00
Indianapolis Street Ry.	0.19
Indiana Service Corp.	0.36
Lafayette Street Ry.	1.00
Union Traction Co.	0.25
Kentucky	
Louisville Ry.	1.13
Louisiana	
New Orleans Public Service Inc.	0.80
Maryland	
United Rys. & Elec. Co., Baltimore	4.45
Massachusetts	
Berkshire St. Ry.	0.21
Boston Elevated Ry.	2.60
Eastern Mass. Street Ry.	4.91
Worcester Consolidated St. Ry.	0.22
Michigan	
Dept. of Street Rys., Detroit	16.48
Eastern Michigan Ry.	1.50
Minnesota	
Duluth Street Ry.	0.59
Twin City Rapid Transit Co.	4.00
Missouri	
Kansas City Public Service Co.	1.14
St. Louis Public Service Co.	1.10
Nebraska	
Omaha & Council Bluffs Street Ry.	0.97
New York	
International Ry., Buffalo	0.45
New York, Westchester & Boston Ry.	2.92
Niagara Junction Ry.	0.60
Third Avenue Railway	0.13
Steinway Railway	0.04
North Dakota	
Northern States Pwr. Co., Fargo	0.14
Ohio	
Cincinnati Street Ry.	0.18
Community Traction Co.	0.21
Cleveland Ry.	10.94
Ohio Public Service Co.	0.11
Pennsylvania-Ohio Pwr. & Lt. Co.	0.27
Toledo Western Ry.	0.13
Oklahoma	
Oklahoma Railway	23.76
Oklahoma Union Ry.	0.82
Oregon	
Portland Electric Power Co.	2.00
Pennsylvania	
Conestoga Traction Co.	0.43
Harrisburg Rys.	0.28
Philadelphia Rapid Transit Co.	3.22
Pittsburgh Railways	2.91
York Railways	0.27
Rhode Island	
United Elec. Rys., Providence	0.27
Tennessee	
Memphis Street Ry.	0.0
Texas	
Dallas Ry. & Terminal Co.	0.28
Eastern Texas Elec. Co.	0.23
Houston North Shore Ry.	0.33
Texas Electric Ry.	1.50
Utah	
Salt Lake & Utah R.R.	1.65
Virginia	
Lynchburg Traction & Light Co.	0.35
Virginia Public Service Co.	0.10
Washington	
Seattle Municipal Street Ry.	0.42
Spokane, Coeur d'Alene & Palouse Rys.	0.12
Tacoma Ry. & Power Co.	0.17
Yakima Valley Transportation Co.	0.06
West Virginia	
Monongahela West Penn. Pub. Serv. Co.	0.08
Wisconsin	
Milwaukee Elec. Ry. & Light Co.	10.45
Wisconsin Gas & Elec. Co.	0.38
Canada	
British Columbia Elec. Ry.	0.30
Cornwall Street Ry. Light & Power Co.	0.50
Hamilton Street Ry.	4.00
Montreal Tramways	11.52
Niagara, St. Catherines & Toronto Ry.	0.20
Nova Scotia Light & Power Co.	0.17
Oshawa Ry.	0.48
Saskatoon Municipal Ry.	1.20
Sherbrooke Elec. Ry. & Power Co.	0.11
Winnipeg Elec. Co.	3.27
Total	167.71

the volume of track reconstruction done last year as compared with the preceding year was to be expected, however, as the budget figures published in the Jan. 12, 1929, statistical issue of ELECTRIC RAILWAY JOURNAL showed a slight reduction in the expenditures planned for way and structures in 1929 as compared with 1928. Indications from similar reports received during the past few weeks are that the volume of trackwork which will be done during the coming year will show a considerable increase.

The largest single program of track reconstruction reported for the year 1929 was that of the Department of Street Railways, Detroit, which rebuilt more than 42 miles of track. Next in size were the programs of the Pittsburgh Railways, Public Service Co-ordinated Transport and the Philadelphia Rapid Transit Company which rebuilt about 32, 26 and 25 miles of track, respectively. Other urban railways reporting more than 10 miles of reconstruction during the past year include the Connecticut Company, Chicago Surface Lines, Twin

Track Reconstruction in 1929

Name of Company	Miles Paved	Miles Open
Alabama		
Alabama Power Co., Anniston	....	0.76
Alabama Power Co., Montgomery	0.45	....
Alabama Power Co., Tuscaloosa	0.15	....
Birmingham Elec. Co.	2.32	6.45
Birmingham & Edgewood Elec. Ry.	....	0.32
Mobile Light & R.R. Co.	3.53	7.21
Arkansas		
Texarkanna Street Railway	....	0.20
California		
Key System Transit Co.	2.18	....
Los Angeles Ry.	17.53	....
Market St. Ry., San Francisco	2.22	....
Municipal Ry. of San Francisco	0.77	....
Pacific Elec. Ry.	3.36	11.41
Southern Pacific Co., East Bay Div.	5.84	4.62
Colorado		
Denver & Intermountain R.R.	....	0.04
Denver Tramway	2.60	1.23
Connecticut		
Connecticut Co.	10.90	1.02
Delaware		
Delaware Elec. Power Co.	0.65	....
District of Columbia		
Capital Traction Co.	1.63	....
Washington Ry. & Elec. Co.	4.07	....
Florida		
Gulf Power Co., Pensacola	0.11	0.06
Jacksonville Traction Co.	....	1.71
Tampa Electric Co.	1.00	....
Georgia		
Georgia Power Co., Atlanta	6.14	....
Illinois		
Calumet & South Chicago Ry.	0.86	....
Chicago, Aurora & Elgin R.R.	....	12.00
Chicago City Ry.	9.11	....
Chicago Rys.	14.32	0.25
Chicago & Joliet Elec. Ry.	1.00	....
Chicago, No. Shore & Milwaukee R.R.	1.28	3.03
East St. Louis Ry.	0.50	....
Illinois Power & Light Corp., Champaign	....	0.04
Illinois Power & Light Corp., Decatur	0.15	....
Illinois Power & Light Corp., Peoria	1.60	....
Rockford Elec. Co.	0.35	....
St. Louis & Alton Ry.	....	1.93
St. Louis & Belleville Elec. Ry.	....	0.41
Indiana		
Beech Grove Traction Corp.	....	1.00
Chicago, S. Bend & Northern Ind. Ry.	1.25	....
Chicago, S. Shore & S. Bend R.R.	....	7.00
Indianapolis St. Ry.	1.47	1.18
Indiana Service Corp.	....	0.55
Lafayette Street Railway	1.00	....
Terre Haute, Ind. & Eastern Trac. Co.	0.19	....
Union Traction Co.	0.05	....
Kansas		
Kansas Power & Light Co.	0.76	....
Wichita R.R. & Light Co.	0.50	....
Kentucky		
Louisville Ry.	2.09	0.88
Louisville & Interurban Ry.	0.11	....
Louisiana		
New Orleans Public Service, Inc.	3.58	3.33
Maine		
Biddeford & Saco R.R.	....	1.50
York Utilities Co.	0.90	0.90
Maryland		
Potomac Edison Co.	0.38	....
United Rys. & Elec. Co., Baltimore	7.63	1.33
Massachusetts		
Berkshire St. Ry.	0.05	1.57
Boston Elevated Ry.	5.02	2.76
Boston, Revere Beach & Lynn R.R.	....	4.00
Boston, Worcester & New York St. Ry.	....	15.00
Eastern Mass. St. Ry.	8.41	1.25
Springfield St. Ry.	2.34	2.28
Union Street Ry., New Bedford	1.00	3.00
Worcester Consolidated St. Ry.	2.22	0.34
Michigan		
Eastern Michigan-Toledo R.R.	0.10	....
Eastern Michigan Railway	2.10	....
Dept. of Street Railways, Detroit	40.22	2.05
Minnesota		
Duluth St. Ry.	3.11	....
Northern States Pwr. Co., St. Cloud	....	1.00
Twin City Rapid Transit Co.	13.80	....
Missouri		
Hannibal Ry. & Elec. Co.	0.19	....
Kansas City Public Service Co.	0.49	....
Springfield Traction Co.	1.27	....
St. Joseph Ry., Lt., Ht. & Pwr. Co.	0.50	....
St. Louis Public Service Co.	7.00	0.32
Montana		
Butte Elec. Ry.	0.40	....
Nebraska		
Lincoln Traction Co.	0.41	....
Omaha & Council Bluffs St. Ry.	0.88	0.08
Omaha Lincoln & Beatrice Ry.	0.25	....
New Hampshire		
Berlin Street Railway	....	0.38
Nashua Street Railway	0.33	....
New Jersey		
Public Service Co-ord. Transport	23.85	2.11
New York		
International Ry., Buffalo	10.51	0.54
Jamaica Central Rys.	1.35	....
Jamestown Street Railway	1.23	....
Manhattan & Queens Trac. Corp.	0.28	4.83
New York Rys.	0.68	....
New York & Queens County Ry.	1.26	3.63
New York State Rys., Rochester	1.91	3.10
New York State Rys., Syracuse	....	1.96
New York State Rys., Utica	0.61	....
Schenectady Ry.	1.25	....
Steinway Ry.	1.61	....
Syracuse & Eastern R.R.	0.58	....
Triple Cities Traction Co., Binghamton	0.47	1.70
Third Ave. Ry.	12.16	....
United Traction Co., Albany	1.79	....
North Carolina		
Carolina Pwr. & Lt. Co., Raleigh	....	0.25
Tide Water Power Co., Wilmington	....	0.13
North Dakota		
Northern States Pwr. Co., Fargo	0.48	....
Ohio		
Cincinnati, Hamilton & Dayton Ry.	0.56	0.28
Cincinnati, Newport & Covington, Ky.	3.70	....
Cincinnati St. Ry.	15.00	1.62
Cleveland Ry.	8.35	0.71
Cleveland Southwestern Ry. & Lt. Co.	0.50	....
Columbus Ry., Pwr. & Lt. Co.	1.49	....
Columbus, Delaware & Marion Elec. Co.	1.00	....
Community Traction Co., Toledo	8.12	0.70
Indiana, Columbus & Eastern Trac. Co.	....	19.90
Lake Shore Elec. Ry.	1.85	2.00
Lima & Toledo R.R.	0.28	13.10
Lorain St. Railroad	0.34	....
Lancaster Traction & Power Co.	1.00	....
Northern Ohio Pwr. & Lt. Co.	3.55	....
Pennsylvania-Ohio Pwr. & Lt. Co.	0.34	....
Shenango Valley Trac. Co.	0.32	....
Stark Electric R.R.	0.56	....
Toledo & Western Ry.	0.38	1.50
Toledo, Fostoria & Findlay Ry.	0.50	....
Western Ohio Ry. & Power Corp.	0.40	....
West End Trac. Co.	....	0.72
Oklahoma		
United Service Co., Tulsa	2.00	....
Oregon		
Portland Electric Power Co.	....	1.25
Pennsylvania		
Allegheny Valley Street Railway	0.10	3.30
Altoona & Logan Valley Elec. Ry.	0.70	2.17
Beaver Valley Traction Co.	1.58	....
Conestoga Traction Co.	0.20	....
Erie Rys.	1.00	....
Harrisburg Rys.	0.97	0.25
Johnstown Traction Co.	2.00	....
New Castle Elec. St. Ry.	0.50	....
Northern Ohio Power & Light Co.	3.55	....
Philadephia Rapid Transit Co.	24.69	0.64
Pittsburgh Railways	27.85	4.66
Pittsburgh, Harmony, Butler & New Castle Ry.	1.00	15.00
Reading Transit Co.	1.75	....
Scranton Ry.	1.44	0.15
Southern Pennsylvania Traction Co.	0.55	....
Valley Rys., Lemoyne	0.63	0.62
Webster, Monessen, Belle Vernon, Fayette City St. Ry.	0.31	....
West Penn. Rys.	1.20	0.90
Wilkes-Barre Ry.	1.10	0.63
Williamsport Rys.	0.13	....
York Railways	1.09	....
Rhode Island		
United Elec. Rys., Providence	7.50	....
Tennessee		
Knoxville Power & Light Co.	0.21	....
Memphis St. Ry.	8.10	....
Nashville Ry. & Lt. Co.	1.45	1.55
Tennessee Electric Power Co.	3.12	....
Texas		
Dallas Ry. & Terminal Co.	1.28	0.50
Galveston Elec. Co.	0.59	....
Houston Elec. Co.	0.02	0.81
San Antonio Public Service Co.	0.71	3.12
Texas Elec. Ry.	1.00	1.00
Utah		
Salt Lake & Utah R.R.	....	0.75
Utah Light & Traction Co.	0.20	....
Virginia		
Lynchburg Trac. & Lt. Co.	2.00	....
Roanoke Ry. & Elec. Co.	0.65	1.28
Virginia Elec. & Pwr. Co.	6.15	1.66
Virginia Public Service Co.	0.19	....
Washington		
Gray's Harbor Ry. & Lt. Co.	0.71	....
Seattle Municipal St. Ry.	2.70	3.06
Spokane United Rys.	0.77	5.00
Tacoma Ry. & Pwr. Co.	2.92	2.87
West Virginia		
Charleston Interurban R.R.	0.25	....
Monongahela West Penn Pub. Serv. Co.	0.32	0.16
Wheeling Traction Company	3.00	1.30
Wisconsin		
Chicago & Milwaukee Elec. Ry.	1.28	....
Madison Rys.	0.50	....
Milwaukee Elec. Ry. & Lt. Co.	10.52	4.58
Northern States Power Co., Eau Claire	1.00	2.30
Wisconsin Power & Lt. Co.	0.75	....
Wisconsin Valley Elec. Co.	0.70	....
Hawaiian Islands		
Honolulu Rapid Transit Co.	0.63	....
Canada		
British Columbia Elec. Ry.	2.17	1.55
Cape Breton Electric Co.	0.75	....
Cornwall St. Ry. Lt. & Power Co.	0.50	....
Edmonton Radial Ry.	0.86	....
Hamilton St. Ry.	2.00	....
Hydro-Electric Rys., Guelph	....	0.50
Hydro Electric Rys., Kingsville	1.00	....
Hydro-Electric Rys., Windsor	1.10	....
Lethbridge Municipal St. Ry.	....	1.00
Levis Tramways	1.50	....
London Street Ry.	0.88	....
Montreal Tramways	10.37	0.25
New Brunswick Power Co.	0.53	0.38
Nova Scotia Light & Power Co.	0.64	1.26
Ottawa Electric Railway	3.00	....
Saskatoon Municipal Ry.	1.00	....
Sherbrooke Elec. Ry. & Power Co.	0.60	0.45
Toronto Transportation Commission	5.04	....
Winnipeg Elec. Co.	1.32	....
Totals	**472.07**	**228.07**

City Rapid Transit Company, Mobile Light & Railroad Company, International Railway at Buffalo, Cincinnati Street Railway, Milwaukee Electric Railway & Light Company, Los Angeles Railway, Third Avenue Railway and the Montreal Tramways. Among the interurbans, the Pacific Electric Railway, the Pittsburgh, Harmony, Butler & New Castle, the Boston, Worcester & New York Street Railway, the Indiana, Columbus & Eastern Traction Company, the Lima & Toledo Railroad and the Chicago, Aurora & Elgin Railroad reported more than 10 miles of reconstruction done during the past year.

Less track was permanently abandoned by the electric railways during 1929 than in other recent years. In all, about 750 miles of track was abandoned by companies which continued to operate the major portions of their rail systems. Reasons for such abandonments were the same as those which have actuated similar actions in the past—light traffic which did not produce sufficient revenue to meet operating costs or the necessity to make large expenditures for rehabilitation, or both. In many instances bus operation under the management of the railway was inaugurated to replace the rail service formerly given. In some instances, however, where traffic was extremely thin, it was not deemed advisable to supply service of any kind.

The number of electric railways which abandoned all rail operation was smaller in 1929 than in any other recent year, as was also the mileage involved. Altogether, there were fewer than twenty such companies operating only about 300 miles of track. Among these the West Chester Street Railway, the Burlington Traction Company, the Sioux Falls Traction System and the Hamilton Radial Electric Railway, all replaced their rail service by bus service under their own auspices. The Bethlehem Transit Company abandoned rail operation, and bus service is now furnished by the Lehigh Valley Transit Company. All rail operations were abandoned in the small cities of Plattsburgh, N. Y., and Santa Barbara, Cal., without the substitution of any other organized transportation service. Other complete abandonments of the year include the Manhattan Bridge 3-Cent Line of New York City and the Van Brunt & Erie Basin Railroad in Brooklyn. Prior to their abandonment the service rendered by these companies had been superseded to a large extent by under-river tunnels and rapid transit service.

Analysis of the conditions surrounding the abandonment of some 150 electric railway systems during the past decade shows that the great majority have occurred in small communities. The average size of the population served was approximately 10,000 and the average length of the rail system was about 8.5 miles. Nearly half of

Partial Track Abandonments in 1929

Name of Company	Miles
Alabama	
Birmingham Elec. Co.	0.14
Arizona	
Street Ry., City of Phoenix	5.50
Tucson Rapid Transit Co.	1.01
Arkansas	
Arkansas Pwr. & Lt. Co., Pine Bluff	0.20
California	
Key System Transit Co.	9.32
Market St. Ry., San Francisco	0.10
Pacific Coast Ry., San Luis Obispo	0.44
Pacific Elec. Ry.	10.54
Peninsular Ry., San Jose	2.00
Sacramento Northern Ry.	0.13
San Diego Elec. Ry.	1.30
Colorado	
Denver Tramway	11.76
Connecticut	
Connecticut Co.	42.49
New Haven & Shore Line Elec. Ry.	18.13
Delaware	
Delaware Elec. Power Co.	11.76
District of Columbia	
Washington Ry. & Elec. Co.	0.05
Florida	
Gulf Power Co., Pensacola	1.81
Jacksonville Trac. Co.	1.26
Georgia	
Columbus Elec. & Pwr. Co.	0.90
Georgia Power Co., Rome	1.60
Savannah Electric & Power Co.	2.51
Illinois	
Alton Ry.	4.18
Chicago & Illinois Valley R.R.	14.39
Chicago & Joliet Elec. Ry.	1.00
Illinois Power & Light Corp., Bloomington	0.98
Illinois Power & Light Corp., Galesburg	1.50
Illinois Power & Light Corp., Quincy	15.94
Rockford, Beloit & Janesville Elec. Ry.	10.00
Indiana	
Indiana, Columbus & Eastern Traction Co.	8.37
Interstate Public Service Co.	2.16
Northern Indiana Power Co.	0.25
Union Traction Co.	0.65
Iowa	
Mississippi Valley Elec. Co., Iowa City	1.00
Omaha & Council Bluffs Ry. & Bridge Co.	0.77
Tri-City Ry. of Iowa	1.74
Kansas	
Kansas Power & Light Co., Topeka	8.24
Kentucky	
Kentucky Utilities Co., Paducah	2.20
Louisville Ry.	0.28
Louisiana	
New Orleans Public Service, Inc.	13.76
Orleans-Kenner Trac. Co.	3.61
Maine	
Androscoggin & Kennebec Ry.	16.22
York Utilities Co.	32.68
Maryland	
Potomac Edison Co.	10.09
United Rys. & Elec. Co., Baltimore	6.33
Massachusetts	
Berkshire St. Ry.	2.73
Boston El. Ry.	19.54
Eastern Mass. St. Ry.	16.81
Fitchburg & Leominster St. Ry.	5.00
Massachusetts Northeastern St. Ry.	18.17
Middlesex & Boston St. Ry.	22.77
Worcester Consolidated St. Ry.	17.40
Michigan	
Dept. of Street Rys., Detroit	2.07
Lake Superior Dist. Pwr. Co., Ironwood	5.54
Minnesota	
Duluth St. Ry.	0.31
Twin City Rapid Transit Co.	0.26
Missouri	
City Light & Traction Co., Sedalia	0.45
Kansas City Public Service Co.	0.14
St. Louis Public Service Co.	4.26
Nebraska	
Omaha & Council Bluffs St. Ry.	0.19
New Jersey	
Coast Cities Railway	13.32
New York	
Fonda, Johnstown & Gloversville R.R.	4.05
International Ry, Buffalo	4.57
New York Rys.	0.15
New York State Rys., Oneida	1.71
New York State Rys., Rochester	44.86
New York State Rys., Utica	1.42
Niagara Junction Ry.	0.25
Ogdensburg St. Ry.	1.70
Steinway Railway	0.05
Third Avenue Ry.	20.04
United Traction Co., Albany	4.19
Ohio	
Cincinnati St. Ry.	1.60
Cleveland Ry.	6.15
Columbus Ry., Pwr. & Lt. Co.	3.47
Community Traction Co., Toledo	7.29
New Castle & Lowell Ry.	0.26
Northern Ohio Power & Light Co.	65.04
Ohio River Ry. & Pwr. Co.	9.29
Pioneer Transportation, Inc.	1.75
Youngstown Municipal Ry.	4.84
Oklahoma	
Northeast Oklahoma R.R.	0.60
Oklahoma Union Ry.	13.51
Pennsylvania	
Beaver Valley Traction Co.	0.06
Conestoga Traction Co.	0.17
Harrisburg Rys.	0.31
New Castle Elec. St. Ry.	0.32
Philadelphia Rapid Transit Co.	2.15
Pittsburgh Railways	2.17
Reading Transit Co.	0.25
Scranton Ry.	0.72
Valley Rys., Lemoyne	0.25
Rhode Island	
United Elec. Rys., Providence	44.90
Texas	
Eastern Texas Elec. Co.	0.68
Northern Texas Traction Co.	3.70
San Antonio Public Service Co.	2.57
Utah	
Utah Light & Traction Co.	5.71
Virginia	
Lynchburg Trac. & Lt. Co.	0.25
Petersburg, Hopewell & City Point Ry.	3.00
Roanoke Ry. & Elec. Co.	1.05
Virginia Elec. & Pwr. Co.	7.38
Virginia Public Service Co.	0.07
Washington	
Pacific Northwest Traction Co.	6.94
Seattle Municipal St. Ry.	6.12
Spokane, Coeur d'Alene & Palouse Rys.	0.40
Tacoma Ry. & Power Co.	20.66
Yakima Valley Transportation Co.	0.04
West Virginia	
Monongahela West Penn. Pub. Serv. Co.	22.28
Wisconsin	
Milwaukee Elec. Ry. & Lt. Co.	10.98
Wisconsin Public Service Corp.	21.22
Canada	
London Street Ry.	1.25
Montreal Tramways	0.90
Niagara, St. Catherines & Toronto Ry.	0.10
Oshawa Ry.	0.02
Winnipeg Elec. Co.	0.79
Total	766.45

these companies and half of the total miles of track were in towns having an average population of less than 5,000 persons. Only 10 per cent of the abandoned railways were located in towns of over 20,000 population.

A considerable number of other abandoned electric railway systems were so located that exact determination of the population served is impossible. From the fact that in many instances no organized transportation service has replaced the abandoned rail service, however, it may be inferred that the population formerly served by these lines also was exceedingly small.

Bus service has replaced rail service over about two-thirds of the abandoned mileage. In many instances this is being given by the same management which formerly gave rail service, but in some instances new management has come in. On some 1,300 miles of track where the traffic was so light that it became necessary to discontinue rail service, no organized transportation service of any kind is now given.

Entire Electric Railway Properties Abandoned in 1929

Name of Company	Miles of Track
Atlantic City & Suburban Ry.	16.00
Augusta-Aiken Railway	25.10
Bethlehem Transit Co.	7.25
*Burlington Rapid Transit Co.	16.50
Commission of Public Docks, Portland, Ore.	1.50
Detroit, Jackson & Chicago Ry.	69.14
*Hamilton Radial Elec. Ry.	18.00
Lima & Defiance R.R., Ohio	45.00
Lowell & Fitchburg St. Ry.	13.22
Manhattan Bridge 3c. Line	4.50
Plattsburgh Traction Co.	7.58
Puget Sound Power & Light Co., Southern District	6.66
Santa Barbara & Suburban Ry.	8.99
*Sioux Falls Traction System	14.50
*Vermont Co.	12.02
Van Brunt Street & Erie Basin R.R.	2.78
Warren & Jamestown St. Ry.	20.38
*West Chester Street Railway	28.00
Total	317.12

* Bus service substituted under same management.

Rapid Transit Situation Shows Little Change

New York, Boston, Philadelphia and Chicago are the only ones in which regular high-speed subway and elevated service is given

NOTWITHSTANDING widespread interest in transit in many cities, there are only four metropolitan centers in the United States where lines devoted exclusively to rapid transit passenger movement has been constructed. These are New York, Boston, Philadelphia and Chicago. The accompanying table gives the route and track mileages and the number of cars operated, as compiled from available sources.

New York, on account of the immense concentration of population in a limited area, naturally has the greatest rapid transit mileage. Two separate companies give both subway and elevated service in the boroughs of Manhattan, Brooklyn and Queens. The Interborough system alone operates in the Bronx, and the Staten Island Rapid Transit Company, which is an electrification of the steam railroad which has been in operation for many years, serves the Borough of Richmond (Staten Island). Besides these lines, the Hudson & Manhattan Railroad, popularly known as the Hudson Tubes, operates an underground system beneath Sixth Avenue, Manhattan, which crosses the Hudson River to reach points in Jersey City and Hoboken. A second route runs from the Hudson Terminal at Church and Dey Streets, Manhattan, to Jersey City and continues on surface tracks of the Pennsylvania Railroad to Newark. While the Hudson & Manhattan is an interstate line, and as such comes under the supervision of the Interstate Commerce Commission, its service differs but little from rapid transit.

For years the Long Island Railroad has been serving the urban population of New York City with suburban transit. It operates into the heart of Manhattan and supplements to a large extent the subway and elevated lines. The same is true to a lesser extent of the suburban services of the New York Central, New York, New Haven & Hartford, and New York, Westchester & Boston.

In Boston the rapid transit service is given by the trains of the Boston Elevated Railway. In addition there are several routes of surface cars operating on elevated or subway tracks. The most important of these is the Boylston Street subway, which runs from Kenmore to Park Street at the edge of the Boston Common. Another route runs on an elevated track from Lechmere Square to North Station, the surface cars continuing into the Tremont Street Subway to Park Street.

The Boston, Revere Beach & Lynn Railroad is a narrow-gage line operating on its own right-of-way between East Boston and Lynn, Mass. Its method of operation differs but little from the rapid transit lines of the Boston Elevated Railway, and for that reason it is included.

Data on Rapid Transit Lines in United States

	Route Miles — Subway	Route Miles — Elevated	Total Track Miles	Cars
Chicago, Ill.				
Chicago Rapid Transit Co.	0.0	81.1	229.5	1,797
Boston, Mass.				
Boston Elevated Railway	12.2	10.0	57.5	528
Boston, Revere Beach & Lynn R.R.	0.0	13.8*	31.0	96
New York, N. Y.				
Brooklyn-Manhattan Transit Co.	41.66	.....	280.6	1,939
Interborough Rapid Transit Co.	44.6	116.6	356.7	3,712
Hudson & Manhattan R.R.	8.5	0.0†	20.0	305
Staten Island Rapid Transit Co.	0.0	21.6*	44.7	100
Philadelphia, Pa.				
Philadelphia Rapid Transit Co.				
Market St.-Frankford Elevated	2.6	11.8	39.0	215
Broad St. Subway	6.1	0.0	20.9	150

*Operates a high-speed line on the surface on private right-of-way.
†Operates a subway line and leases a high-speed surface line on the private right-of-way of the Pennsylvania Railroad to Newark, N. J.

Besides these lines there are several instances where electric railways and electrified steam lines give service comparable with that already described. The Northwestern Pacific Railroad, and the Key System Transit Company, operating across the bay from San Francisco, are examples of this class of service. The Illinois Central Railroad runs a suburban service in the city of Chicago and its suburbs that is comparable to rapid transit. Beginning in the near future certain lines centering in the Cleveland Union Terminal will furnish suburban service, principally within the city of Cleveland, differing but little from rapid transit.

In the city of Cincinnati a rapid transit subway has been constructed, but the stations never have been built nor track laid. For that reason it is impossible to include it in the tabulation.

Bus Operations *Are Steadil*

By

J. R. STAUFFER

Assistant Editor *Electrical Railway Journal*

CONTINUED activities in the co-ordination of bus and trolley operations, substitution of buses for cars on small, unprofitable lines that did not warrant rehabilitation, and the merging of numerous independent units into stronger unified systems were the dominant features in the development of bus operations by electric railways in 1929.

These adjustments involved the purchase of nearly 2,200 buses during the past year and the extension and installation of bus routes of approximately 4,000 miles, bringing the total number of buses now operated by the electric railways of the United States and Canada to 12,451 and the total number of bus-miles covered to 24,937. In comparison with the 1928 survey, purchases of bus equipment were slightly lower in 1929, but extensions to bus mileage were greater, excluding the mileage added in 1928 by the Southern Pacific Motor Transport Company in special long-haul service.

Bus Operation by Electric Railways and Subsidiary Companies

	No. Buses Jan. 1, 1930
Alabama	
Alabama Power Co. { Gadsden	4
Alabama Power Co. { Sheffield	2
Birmingham Electric Co.	4
*Selma Electric Ry.	5
Arizona	
Phoenix Street Ry.	2
Tucson Rapid Transit Co.	5
*Warren Co.	6
Arkansas	
Arkansas Power & Light Co.	11
Intercity Terminal Railway	9
California	
Bakersfield & Kern Electric Ry.	5
Eureka Street Ry.	1
Key System Transit Co.	64
Los Angeles Ry.	189
Los Angeles Motor Bus Co.	67
Market Street Ry.	6
Municipal Ry. of San Francisco	18
Pacific Electric Ry.	132
Pacific Gas & Electric Co.	11
Peninsular Ry.	8
Sacramento Northern Ry.	1
San Diego Electric Ry.	30
San Francisco, Napa & Calistoga R.R.	2
Napa Valley Bus Co.	
San Jose Railroads	1
Southern Pacific Co. (Electric Division)	52
*Union Traction Co., Santa Cruz	5
Colorado	
Colorado Springs & Interurban Ry.	5
*Denver & Interurban Motor Co.	10
*Denver & South Platte Transportation Co.	2
Denver Tramway	22
Bus Transportation Co.	
Fitzsimons Bus & Taxi Co.	
Grand River Valley Ry.	2
Public Service Co. of Colo.	5
Connecticut	
Connecticut Co.	165
*Danbury Power & Transportation Co.	17
*Groton & Stonington Traction Co.	14
*Lordship Ry.	5
New Haven & Shore Line Ry.	13
Waterbury & Mildale Tramway	3
Delaware	
Delaware Electric Power Co.	22
Delaware Bus Co.	
District of Columbia	
Capital Traction Co.	42
Washington Ry. & Electric Co.	101
Washington & Old Dominion Ry.	1
Florida	
Jacksonville Traction Co.	4
*Key West Electric Co.	5
Miami Beach Ry.	50
Municipal Ry. of St. Petersburg	8
Tampa Electric Co.	23
Georgia	
Columbus Electric & Power Co.	22
Columbus Transportation Co.	
Georgia Power Co.	29
Atlanta Coach Co.	
Savannah Electric & Power Co.	18
Idaho	
*Boise Street Car Co.	11
Illinois	
Alton Ry.	5
Aurora, Elgin & Fox River Electric Co.	5
*Central Illinois Public Service Co. { Charleston	2
*Central Illinois Public Service Co. { Springfield	9
*Central Illinois Traction Co.	3
Chicago, Aurora & Elgin R.R.	10
Western Motor Coach Co.	
Chicago City Ry.	3
Chicago & Illinois Valley R.R.	10
Chicago & Joliet Electric Ry.	10
Chicago & Joliet Transportation Co.	
Chicago, North Shore & Milwaukee R.R.	85
Metropolitan Motor Coach Co.	
Chicago Ry.	5
Chicago & West Towns Ry.	46
East St. Louis & Suburban Ry.	5
East St. Louis Ry.	13
Evanston Ry.	27
Evanston & Niles Center Bus Co.	
Illinois Power Co.	19
Illinois Power & Light Corp.	139
Illinois Terminal R.R.	18
*Joliet, Plainfield & Aurora Transp. Co.	6
Kewanee Public Service Co.	2
Rockford Electric Co.	26
Rockford & Interurban Ry.	10
Tri-City Ry. of Ill.	5
Indiana	
Beech Grove Traction Corp.	8
Chicago, South Bend & Northern Indiana Ry.	25
Chicago, South Shore & South Bend R.R.	108
Shore Line Motor Coach Co.	
Evansville & Ohio Valley Ry.	10
Gary Railways	5
Indianapolis, Columbus & Southern Trac. Co.	2
Indianapolis Street Ry.	27
Peoples Motor Coach Co.	
Indianapolis & Southeastern R.R.	8
Indiana Service Corp.	12
Interstate Public Service Co.	32
Northern Indiana Power Co.	5
Southern Indiana Gas & Electric Co.	17
Southern Michigan Ry.	3
Terre Haute, Indianapolis & Eastern Trac. Co.	50
Indiana Motor Transit Co.	
T. H. I. & E. (Terre Haute Div.)	19
Union Traction Co. of Indiana	51
Iowa	
Cedar Rapids & Iowa City R.R.	8
Clinton, Davenport & Muscatine Ry.	3
Des Moines & Central Iowa R.R.	3
*Des Moines Electric Light Co.	6
Fort Dodge, Des Moines & Southern R.R.	37
Ft. Dodge, Des Moines & South. Transp. Co.	
Fort Madison Street Ry.	2
Interstate Power Co.	9
*Iowa Railway & Light Co., Marshalltown	9
Iowa Southern Utilities Co.	
Burlington	22
Centerville	3
Ottumwa	6
Mississippi Valley Electric Co.	5
Waterloo, Cedar Falls & Northern Ry.	11
Tri-City Ry.	15
Kansas	
Arkansas Valley Interurban Ry.	12
Arkansas Valley Transportation Co.	
Kansas City, Leavenworth & Western Ry.	13
Leavenworth Transportation Co.	
Kansas Power & Light Co.	39
Kansas Public Service Co.	2
Salina Street Ry.	2
United Power & Light Corp.	3
Wichita Railroad & Light Co.	50
Wichita Motor Bus Co.	
Kentucky	
Kentucky Traction & Terminal Co.	29
Kentucky Coach Co.	
Consolidated Coach Corp.	
Kentucky Utilities Co.	12
Louisville Ry.	43
Kentucky Carriers, Inc.	
Louisiana	
Baton Rouge Electric Co.	3
*Louisiana Elec. Co.	7
Municipal Street Ry., Alexandria	12
New Orleans Public Service, Inc.	39
Maine	
York Utilities Co.	5
Maryland	
*Cumberland & Westernport Transit Co.	13
Potomac Edison Co.	93
Blue Ridge Transportation Co.	
United Rys. & Electric Co.	122
Baltimore Coach Co.	
Washington, Baltimore & Annapolis Elec. R.R.	3
Massachusetts	
Berkshire Street Ry.	4
Boston Elevated Ry.	319
Boston, Revere Beach & Lynn Ry.	2
Point Shirley St. Ry. Co.	
Boston, Worcester & New York Street Ry.	11
Eastern Massachusetts Street Ry.	90
East Taunton Street Ry.	2
Fitchburg & Leominster Street Ry.	7
*Gardner-Templeton Street Ry.	9
Holyoke Street Ry.	3
Interstate Street Ry.	14
Middlesex & Boston Street Ry.	98
*Milford, Framingham, Hopedale & Uxbridge Coach Co.	7
Northampton Street Ry.	4

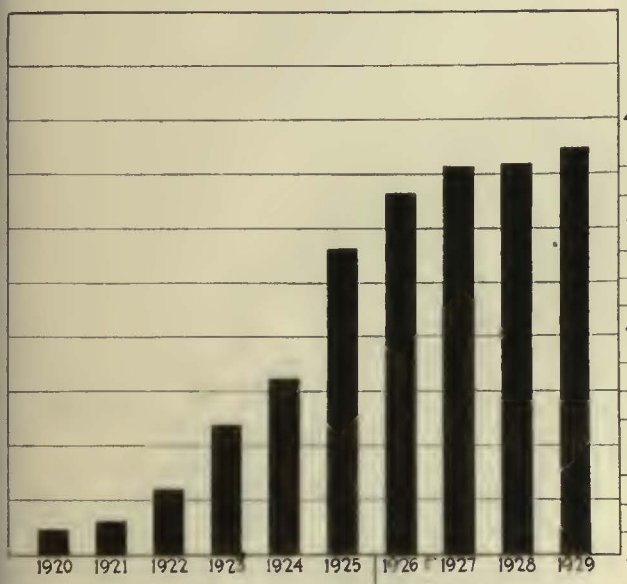
(*Table Continued on page 22*)

Expanded by Electric Railways

Purchases of new buses and extensions of bus mileage during the past year denote normal and healthy progress. Almost 2,200 buses were bought and nearly 4,000 miles of route was added

Of the 2,194 buses bought last year, 1,813 were new equipment while 381 were used and were acquired, in most cases, in the absorption of independent bus companies by the railways. Similarly, the figure of 775 buses which were sold or scrapped during the year includes a large number of transferred equipment as a result of the merging of interests.

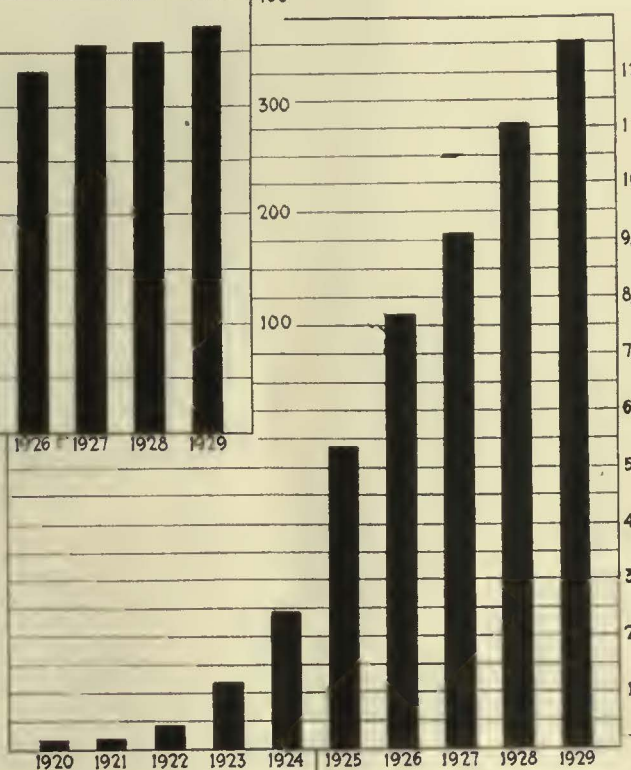
Still maintaining its position as the largest operator of motor buses in the United States, Public Service Co-ordinated Transport, of New Jersey, increased its fleet to a total of 2,337 buses. During 1929 this company purchased 638 buses, of which 374 were new and 264 were second-hand. Practically all of these buses were of the semi-deluxe or deluxe, 29 to 33-passenger type. Approximately 1,100 miles of bus routes was added to the existing routes, bringing the total to 2,852 miles.



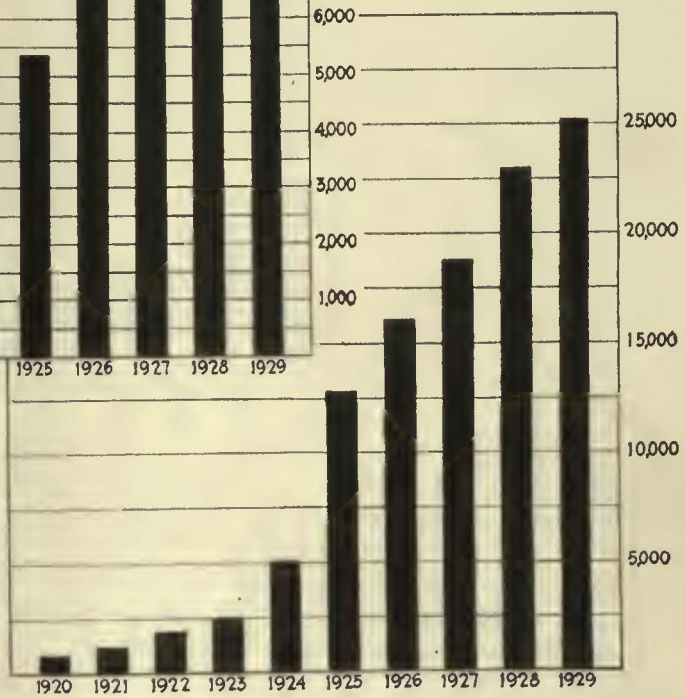
Additional electric railways which inaugurated bus service during the year bring the total to 370

Other large purchasers of bus equipment were: United Electric Railways, Providence, R. I., which bought 72 new buses from 29 to 37-passenger capacity; Toronto Transportation Commission, which added 51 buses ranging in seating capacity from 17 to 33 passengers; New York State Railways, which purchased 50 buses of the 30 to 38-passenger type; Northern Ohio Power & Light, which bought 46 buses of large seating capacity and the Manila Electric Company, which more than doubled its fleet, adding 46 new small type buses to the 36 it already owned. The Boston Elevated Railway, Detroit Street Railways, Cleveland Railway, Virginia Electric & Power Company and the Third Avenue Railway in New York each purchased more than 25 new buses during 1929.

Bus mileage changes during the year include 3,825 miles of extensions and 670 miles of abandoned route. Of the extensions made, only 425 miles replaced former trolley operations, and in almost every case substitution of bus service was made on lines which were due for renewal of tracks or subject to municipal paving demands. The Wheeling Traction Company, through its acquisition of the White Star Lines, extended its bus operations by 197 miles; Wisconsin Power & Light Company extended its bus routes 168 miles, replacing all trolley car service in the city of Janesville, Wis., and 1.75 miles in Oshkosh, Wis. An exchange was made with the Royal Rapid Bus Company whereby three lines—Berlin to Juneau, 51 miles; Plymouth to Elkhart Lake, 7 miles, and Madison to Prairie du Sac, 35 miles—were traded for a 114-mile route from Madison, Wis., to Dubuque, Iowa. The Potomac Edison Company extended its routes 150 miles with bus service, of which 6.69 miles replaced trolley car route; Northern Ohio Power & Light Company extended its bus opera-



Electric railways are now operating more than 12,000 buses



Substantial extensions to bus service in 1929 increase the mileage to 25,000

Bus Operations by Electric Railways and Subsidiary Companies—(Continued)

	No. Buses Jan. 1, 1930
*Plymouth & Brookton Street Ry	11
Springfield Street Ry	52
Union Street Ry	18
Worcester Consolidated Street Ry	62
Michigan	
City of Detroit, Department of Street Rys	533
Eastern Michigan Railways	352
Eastern Michigan Motor Buses	
*Grand Rapids, Grand Haven & Muskegon Ry	6
Grand Rapids R.R	13
Jackson Transportation Co	50
Southern Michigan Transportation Co.	
Kalamazoo Transportation Co	9
Lansing Transportation Co	19
*Menominee & Marinette Light & Traction Co.	15
Muskegon Traction & Lighting Co	2
Saginaw Transit Co	37
Minnesota	
Duluth Street Ry	16
Duluth Superior Coach Co.	
Twin City Rapid Transit Co	101
Twin City Motor Bus Co.	
Mississippi	
Mississippi Power Co.	
(Gulfport Division)	35
*(Hattiesburg Division)	7
*(Meridian Division)	7
Mississippi Power & Light Co.	
*(Greenville Division)	4
(Vicksburg Division)	3
Missouri	
City Light & Traction Co	3
Kansas City, Clay County & St. Joseph Ry	12
Kansas City, Clay County & St. Joseph Auto Transit Co.	
Kansas City Public Service Co	76
Missouri Power & Light Co	2
Springfield Traction Co	14
St. Joseph Ry., Lt., Ht. & Pwr. Co	20
St. Louis Public Service Co	52
Montana	
Butte Electric Ry	5
Nebraska	
Lincoln Traction Co	22
Omaha & Council Bluffs Street Ry	32
New Hampshire	
*Dover, Somersworth & Rochester St. Ry	6
*Keene Electric Ry	7
*Laconia Street Ry	11
Laconia Transit Co.	
Nashua Street Ry	5
*Portsmouth Electric Ry	12
New Jersey	
Atlantic City & Shore R.R	34
Coast Cities Ry	33
Cumberland Traction Co	2
Five-Mile Beach Ry	6
*New Jersey Inter-Urban Co	10
Ocean City Electric R.R	1
Public Service Co-Ordinated Transport	2,337
Trenton Transit Co	35
New York	
Black River Traction Co	16
Watertown Transportation Co.	
Brooklyn & Queens Transit Corp	28
Brooklyn Bus Corp.	
Buffalo & Erie Ry	6
Buffalo & Erie Coach Company	
Cortland County Traction Co	3
Cortland County Bus Lines	
Eastern New York Utilities Corp	3
Eastern New York Transportation Co.	
Empire State Rys	6
Mid-State Coach Lines	
Fonda, Johnstown & Gloversville R.R	5
*Geneva, Seneca Falls & Auburn R.R	3
Hamburg Railway	16
*Hudson Valley Ry	24
Hudson Transportation Co.	
*Huntington Traction Co	5
Huntington Coach Corp.	
International Ry	90
International Bus Corp.	
Jamestown Street Ry	21
Jamestown Motor Bus Transportation Co.	
Kingston Consolidated R.R	6
Kingston City Transportation Co.	
*Newburgh Public Service Co	22
*New York & Stamford Ry	62
County Transportation Co.	
New York State Rys. (Rochester)	84
Rochester Interurban Bus Co.	
Rochester Rys. Co-Ord. Bus Lines.	
East Ave. Bus Co.	
Darling Bus Line.	
New York State Rys. (Syracuse)	32
Syracuse Rys. Co-Ord. Bus Line.	
New York State Rys. (Utica)	14
Utica Rys. Co-Ord. Bus Line.	
Niagara Gorge R.R	6
Niagara Gorge Bus Line	
*Peekskill Lighting & R.R. Corp	29
Peekskill Motor Bus Corp.	
*Port Jervis Transit Co	2
Poughkeepsie & Wappingers Falls Ry	6
Rochester & Syracuse R.R	1
Mid-State Coach Lines.	
Schenectady Ry	24
Schenectady Rapid Transit Co.	
Syracuse & Eastern R.R	6
Syracuse & Eastern Bus Lines.	
Southern New York Ry	4
Manson Transportation Co.	
Third Ave. Ry	184
Surfacs Transportation System	
Triple Cities Traction Co	20
Binghamton Ry. Bus Line	
United Traction Co	90
Capitol District Transp. Co.	
*Walkill Transit Co	8
Waverly, Sayre & Athens Trans. Co	5
North Carolina	
Carolina Power & Light Co	3
Durham Public Service Co	19
North Carolina Public Service Co	16
Greensboro Bus Co.	
Southern Public Utilities Co	20
Tidewater Power Co	2
Coast City Transit Co.	
North Dakota	
Northern States Power Co	4
Northern Transit Co.	
Ohio	
City of Ashtabula—Division of Street Rys	4
Cincinnati Hamilton & Dayton Ry	4
Blus Bus Co.	
Cincinnati, Lawrenceburg & Aurora Electric Street Ry	7
Cincinnati Street Ry	98
Cleveland Ry	187
Cleveland, Southwestern Ry. & Light Co	19
Southwestern Bus Co.	
Columbus, Delaware & Marion Elec. Co	4
Columbus Railway, Power & Light Co	6
Community Traction Co	128
Dayton Street Ry	3
Dayton & Xenia Ry	2
Indiana, Columbus & Eastern Traction Co	20
Dayton & Columbus Transportation Co.	
Lake Shore Electric Ry	3
Lorain Street Ry	8
Maumee Valley Co	13
Maumee Valley Transp. Co.	
Nelsonville-Athens Electric Ry	1
Nelsonville Transp. Co.	
Northern Ohio Power & Light Co	283
Ohio Public Service Co	5
Penn-Ohio Public Service Corp	34
Pioneer Transportation Co	50
Columbus & Zanesville Transp. Co.	
Portsmouth Public Service Co	11
Springfield Ry	1
Steubenville, East Liverpool & Beaver Valley Traction Co	3
West End Traction Co	10
Youngstown Municipal Ry	69
Youngstown & Suburban Ry	13
Youngstown & Suburban Transportation Co.	
Columbiana Bus Co.	
Youngstown Suburban Tourist Lines.	
Oklahoma	
Northern Oklahoma R.R	2
Oklahoma Ry	48
Oklahoma Union Ry	83
Union Transportation Co.	
*Shawnee-Tecumseh Traction Co	12
United Service Co	7
Oregon	
Commission of Public Docks, Portland	1
Oregon Electric Ry	1
Portland Electric Power Co	48
Oregon City Motor Bus Co.	
Pennsylvania	
Allentown & Reading Traction Co	3
Altoona & Logan Valley Electric Ry	23
Logan Valley Bus Co.	
Beaver Valley Traction Co	9
Beaver Valley Motor Coach Co.	
*Berwick & Nescopeck St. Ry	2
*Chambersburg & Shippensburg Ry	6
Cumberland Valley Transp. Co.	
*Citizens Traction Co	33
Citizens Transit Co.	
Conestoga Traction Co	4
Conestoga Transp. Co.	
East Penn Traction Co	9
East Penn Transportation Co.	
Erie Ry	24
Erie Coach Co.	
Johnstown & Somerset Ry	1
Johnstown Traction Co	34
Traction Bus Co.	
Southern Cambria Bus Co.	
Beaverdale and South Fork Bus Co.	
Lackawanna & Wyoming Valley R.R	5
Laurel Line Bus Co.	
Lehigh Traction Co	14
Hazleton Auto Bus Co.	
Lehigh Valley Transit Co	22
Lehigh Valley Transportation Co.	
Lewiston & Reedsville Electric Ry	9
Lewiston Transportation Co.	
*Lewisburg, Milton & Watsonville Pass. Ry. Co.	3
*North Branch Bus Co	10
Philadelphia & Westchester Traction Co	33
Philadelphia Rapid Transit Company	340
Philadelphia Rural Transit Co.	
Pittsburgh Rys	86
Pittsburgh Motor Coach Co.	
Pittsburgh, Mars & Butler Ry	7
Pittsburgh, Harmony, Butler & New Castle Ry.	
Harmony Short Line Motor Transport Co.	
*Pocono Motor Coach Co	10
Reading Transit Co	6
Schuylkill Transportation Co	16
Scranton, Montrose & Binghamton Ry	2
Scranton Ry	19
Scranton Bus Co.	
Shamokin & Edgewood Elec. Ry	9
Shamokin & Treverton Bus Line.	
Shamokin & Mt. Carmel Transportation Co	3
Ashland & Centralia Auto Bus Co.	
Southern Penn Traction Co	35
Southern Penn Bus Co.	
*United Traction Street Ry	2
Dubois Transit Co.	
*West Chester Street Ry	35
Chester Valley Bus Line	
Westmoreland County Ry	6
Chestnut Ridge Transp. Co.	
West Penn Rys	25
Penn Bus Lines.	
Ohio Valley Transit Co.	
Westside Electric Rys	5
Westside Motor Transit Co.	
Wilkes-Barra Ry	33
Wyoming Valley Autobus Co.	
Williamsport Railways	3
Williamsport Transportation Co.	
Woodlawn & Southern Street Ry	6
Rhode Island	
*Newport & Providence Ry	34
United Electric Rys	130
South Carolina	
South Carolina Gas & Electric Co	8
Spartanburg Bus Co.	
Southern Public Utilities	1
South Dakota	
*Sioux Falls Traction System	27
Tennessee	
Knoxville Power & Light Co	6
Nashville Interurban Ry	9
Interurban Bus Co.	
Nashville Railway & Light Co	18
Tennessee Electric Power Co	15
Union Traction Co	1
Texas	
Abilene Traction Co	5
Austin Street Ry	9
Bryan College Traction Co	2
Dallas Ry. & Terminal Co	25
Eastern Texas Electric Co	25
J. G. Holtzclaw Bus Line.	
El Paso Electric Co	7
Houston Electric Co	75
Northern Texas Traction Co	27
Nueces Ry	6
*Rio Grande Valley Traction Co	5
San Antonio Public Service Co	88
*Southwestern Transit Co	4
Texas Electric Ry	6
Wichita Falls Traction Co	11
Utah	
Bamberger Electric R.R	2
Bamberger Transportation Co.	
Utah Light & Traction Co	18
Utah-Idaho Central R.R	5
Utah Rapid Transit Co	2
Vermont	
*Burlington Rapid Transit Co	20
*Twin State Gas & Electric Co	3
Virginia	
Lynchburg Traction & Light Co	3
Petersburg, Hopewell & City Point Ry	3
Roanoke Railway & Electric Co	7
Virginia Electric & Power Co	229
Virginia Public Service Co	5
Citizen's Rapid Transit Corp.	

Bus Operations by Electric Railways and Subsidiary Companies—(Concluded)

	No. Buses Jan. 1, 1930
Washington	
Grays Harbor Ry. & Light Co.	13
North River Transportation Co.	
Twin City Transit Co.	
Lewston-Clarkson Transit Co.	4
Puget Sound Power & Light Co.	41
North Coast Trans. Co.	
Portland-Seattle Stage Co.	
Pacific Northwest Traction Co.	
Seattle Municipal St. Ry.	48
Seattle & Rainier Valley Ry.	2
Tacoma Municipal Belt Line	1
Tacoma Ry. & Power Co.	23
Tacoma Bus Co.	
Yakima Valley Transportation Co.	3
West Virginia	
Charleston Interurban R.R.	6
Midland Trail Transit	
New River Transit	
Red Bird	
Monongahela-West Penn Public Service Co.	48
Monongahela Transport Co.	
Ohio Valley Electric Ry.	18
Ohio Valley Bus Co.	
Wheeling Public Service Co.	4
Bus Transportation Co.	
Wheeling Traction System	52
Ohio Valley Transit Co.	
Wisconsin	
Madison Rys.	9
Milwaukee Electric Ry. & Light Co.	169
Wisconsin Motor Bus Lines.	
Mississippi Valley Public Service	2
Wisconsin Gas & Electric Co.	11
Wisconsin Michigan Power Co.	20
Intercity Bus Company	
Wisconsin Power & Light Co.	74
Wisconsin Public Service Corp.	18
Wisconsin Valley Electric Co.	7
Valley Transit Co.	
Wyoming	
*Cheyenne Motor Bus Co.	9
Hawaii	
Honolulu Rapid Transit Co.	12
Philippine Islands	
Manila Electric Co.	82
Porto Rico	
Ponce Electric Co.	4
Canada	
Brantford & Hamilton Electric Ry.	5
Brantford Municipal Ry.	1
British Columbia Electric Ry.	23
British Columbia Transit Co.	
Dominion Power & Transmission Co.	5
Grand River Ry.	3
Canadian Pacific Transport Co.	
Hamilton, Grimsby & Beamsville Electric Ry.	7
Hamilton Street Ry.	28
Hydro-Electric Rys.	17
Levis Tramways	1
London Street Ry.	11
Montreal Tramways	100
Moose Jaw Electric Ry.	3
New Brunswick Power Co.	1
Niagara, St. Catherines & Toronto Ry.	3
Ottawa Electric Ry.	14
Pictou County Electric Co.	4
Quebec Railway Light & Power Co.	12
Sherbrooke Ry. & Power Co.	4
Toronto Transportation Commission	206
Gray Coach Lines.	
Winnipeg Electric Ry.	48
*Woodstock, Thames Valley & Ingersoll Electric Ry.	3

tions 150 miles, 37.9 miles of which replaced trolley service, and the Boston Elevated Railway added 8.4 miles to its bus routes during the year.

Abandonment of all railway operations in favor of bus service is reported by the following companies, the substitution having been completed this year. The Atlantic and Suburban Railway, Atlantic City, N. J., discontined operation with the abandonment and subsequent sale of its line between Absecon and Somers Point via Pleasantville. The Atlantic City & Shore Railroad is now operating a bus line over this route. The Bethlehem Transit Company ceased operating on Jan. 12, 1929, and most of its track was taken up during the summer months. The Lehigh Valley Transit Company began bus operations in this territory on Jan. 22. In South Carolina, the Augusta-Aiken interurban line was acquired by the South Carolina Power Company through a merger and abandoned in July of this year. Augusta has electric railway service supplied by the Georgia Power Company, while the service between Augusta and Aiken as well as to other points in the Southeastern states is supplied by the independent Camel City Coach Company. In Pennsylvania, the West Chester Street Railway discontinued its entire railway operations on Dec. 1, 1929, and abandoned 28 miles of single track. The Chester Valley Bus Lines, which always has been closely identified with the railway, is now operating bus service in lieu of that formerly given by the trolley. Likewise, the Burlington Rapid Transit Company in Vermont, the Sioux Falls Traction Company in South Dakota, Hamilton Radial Railway in Canada, Puget Sound Power & Light Company, Chehalis, Wash., and the Vermont Company have abandoned all railway operations and through a subsidiary or affiliated bus company have substituted bus service. Included in the total number of bus operating railways are 55 companies which have abandoned all rail service. These companies operate 620 buses on 1,650 miles of route.

The Arkansas Valley Interurban Railway, Wichita, Kan., sold a bus line of 76.5 miles to an operating company with a contract for joint rates and interchange of business, and the Northeast Oklahoma Railroad suspended its bus operations entirely. A small number of other companies abandoned some negligible bus mileage on lines that had been extended into new territory and later proved financially unsatisfactory.

In contrast to these abandonments, ten companies inaugurated bus operations for the first time. The Street Railway of Phoenix, Ariz., purchased buses to cover a new route of 7.75 miles; City Light & Traction Company, Sedalia, Mo., replaced 7.2 miles of car route with buses; the Berkshire Street Railway, Pittsfield, Mass., substituted 21-passenger buses for the trolley car service formerly rendered by the Vermont company, and the Mississippi Power & Light Company, Greenville division, replaced 8.5 miles of trolley service with bus service. In Canada, the Brantford & Hamilton Electric Railway used buses for the first time this year.

Two important and interesting changes in bus operations were effected in 1929. First was the purchase of the companies previously controlled by the O. G. Schultz Management operating in southern New Jersey by Public Service Co-ordinated Transport, Newark, N. J. Twenty-one companies operating eighteen lines were involved in the sale.

The second large step in the unification of all surface transportation of a community was effected in St. Louis with the purchase of the People's Motor Bus Company by the City Utilities Company and the subsequent agreement for co-ordinated operation between this latter company and the St. Louis Public Service Company, now operating all trolley service. Although the People's Motor Bus Company will for the present be operated independently, it will be in friendly co-operation with the electric railway system and the Public Service Company will have the right to purchase the bus company when financial and franchise situations in St. Louis shall warrant.

The City Utilities Company recently acquired 38 per cent of the common stock of the St. Louis Public Service Company and now the purchase of the People's Motor Bus Company gives it a monopoly on the major transportation facilities of the city.

Further co-ordination of car and bus operations, with a number of minor substitutions of buses for cars, is practically assured for the near future. Many properties are continuing to operate some unprofitable lines which will soon require new track, overhead or paving and the question of substitution of bus service on these routes will have to be considered. In some cases it will be found to be economically sound to rebuild the present structure, while again, in many instances, buses will

Buses Bought by Railways During 1929

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Alabama					
Alabama Power Co. (Gadsden Div.)	4	4	White	Bender	29
Arizona					
Phoenix Street Railway	2	†2	Studebaker	Studebaker	21
Tucson Rapid Transit Co	1	1	Dodge	Dodge	21
California					
Los Angeles Motor Bus Co	2	2	Twin Coach	Twin Coach	40
Los Angeles Railway	22	8	Twin Coach	Twin Coach	40
		6	White	White	..
		8			
Municipal Railway of San Francisco	1	1	Mack	Mack	..
Pacific Electric Railway	14	*3	Moreland	Moreland	25
		*1	White	Motor Transit	25
		10	Twin Coach	Twin Coach	40
Pacific Gas & Electric Co	4	4	Yellow Coach	Yellow Coach	21
San Diego Electric Ry	9	6	Twin Coach	Twin Coach	39
		3	Fageol	Fageol	..
Colorado					
Denver Tramway	13	3	White	Bender	25
		2	Mack	Mack	..
		2	A.C.F.	A.C.F.	..
		*1	Dodge	Local	24
		*3	Dodge	Dodge	21
		*1	Reo	Fitzjohn	21
		*1	Studebaker	Studebaker	18
Connecticut					
Connecticut Co	23	21	Mack	Mack	29
		2	Yellow Coach	Yellow Coach	29
Danbury Power and Transportation Co	1	1	Yellow Coach	Yellow Coach	21
Groton-Stonington Traction Co	1	1	Twin Coach	Twin Coach	40
New Haven & Shore Line Ry	16	5	Twin Coach	Twin Coach	37
		11	Twin Coach	Twin Coach	21
Delaware					
Delaware Electric Power Co.	5	5	Yellow Coach	Yellow Coach	29
District of Columbia					
Capital Traction Co	13	4	Yellow Coach	Yellow Coach	29
		3	Yellow Coach	Yellow Coach	29
		1	A.C.F.	A.C.F.	29
		*5	Fageol	Fageol	27
Washington Railway & Electric Co	18	12	Yellow Coach	Yellow Coach	21
		6	Yellow Coach	Yellow Coach	29
Florida					
Jacksonville Traction Co	4	4	Twin Coach	Twin Coach	40
Georgia					
Georgia Power Co	13	4	Reo	Fitzjohn	23
		3	White	White	23
		6	Yellow Coach	Yellow Coach	23
Savannah Electric & Power Co	12	7	Twin Coach	Twin Coach	40
		2	Yellow Coach	Yellow Coach	21
		3	Mack	Mack	29
Idaho					
Boise Street Car Co	4	4	White	Bender	25
Illinois					
Chicago & Illinois Valley R.R.	5	3	Yellow Coach	Yellow Coach	21
		*2	Dodge	Dodge	21
Chicago North Shore & Milwaukee R.R.	18	10	Yellow Coach	Lang	22
		6	A.C.F.	A.C.F.	30
		2	A.C.F.	A.C.F.	39
Chicago & West Towns Ry.	5	5	Mack	Cummings	29
Evanston Railway	10	†5	Yellow Coach	Yellow Coach	39
		*2	Yellow Coach	Yellow Coach	21
		*3	Yellow Coach	Yellow Coach	29
Illinois Power & Light Corp. Champaign	2	2	Yellow Coach	Yellow Coach	29
Illinois Power & Light Corp. Decatur	3	3	Yellow Coach	Yellow Coach	29
Illinois Power & Light Corp. Galesburg	7	7	Yellow Coach	Yellow Coach	21
Illinois Power & Light Corp. Jacksonville	1	*1	Dodge	Dodge	21
Illinois Power & Light Corp. Quincy	6	6	Yellow Coach	Yellow Coach	21
Illinois Power & Light Corp. Springfield	3	3	Mack	Mack	25
Joliet, Plainfield and Aurora Trans. Co	2	1	Will	Eckland	30
		*1	Yellow Coach	Yellow Coach	21
Rockford Electric Co	2	2	A.F.C.	A.C.F.	40
Indiana					
Beech Grove Traction Corp.	5	5	Reo	Fitzjohn	21
Indianapolis, Columbus & Southern Traction Co	2	2	Dodge	Dodge	21
Indianapolis Street Railway	18	3	Dodge	Dodge	21
		8	White	White	29
		5	Mack	Mack	29
		2	Mack	Mack	21
Interstate Public Service	2	2	Dodge	Dodge	21
Northern Indiana Power Co.	2	2	International	Burket	15
Southern Indiana Gas & Electric Co	7	3	Dodge	Dodge	21
		4	Yellow Coach	Yellow Coach	29
Terre Haute, Indianapolis & Eastern Traction Co	14	*8	White	White	28
		*4	Mack	Mack	28
		*1	Ruggles	Ruggles	22
		*1	Ruggles	Ruggles	25

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Iowa					
Cedar Rapids & Iowa City Ry	8		Yellow Coach	Yellow Coach	21
	*3		Mack	Mack	25
Clinton, Davenport & Muscatine Ry	2	2	Yellow Coach	Yellow Coach	21
Fort Dodge, DesMoines & Southern R.R.	8	3	Yellow Coach	Yellow Coach	21
		5	Reo	Fitzjohn	20
Interstate Power Co	2	2	Mack	Mack	25
Iowa Southern Utilities Co.	9	9	Mack	Mack	25
Mississippi Valley Elec. Co.	1	1	Yellow Coach	Yellow Coach	21
Tri-City Railway of Iowa	5	3	Yellow Coach	Yellow Coach	29
		2	Mack	Mack	29
Kentucky					
Kentucky Traction & Terminal Co	8	6	Yellow Coach	Yellow Coach	29
		2	A.C.F.	A.C.F.	29
Kentucky Utilities Co	4	4	Yellow Coach	Yellow Coach	21
Louisville Railway	3	3	Yellow Coach	Yellow Coach	29
Louisiana					
Louisiana Electric Co	3	3	Dodge	Dodge	17
New Orleans Public Service, Inc	7	7	Yellow Coach	St. Louis Car Co.	34
Maine					
York Utilities Co	1	1	Studebaker	Studebaker	15
Maryland					
Cumberland & Westernport Transit Co	4	3	White	Bender	29
		1	Yellow Coach	Yellow Coach	29
Potomac Edison Co	22	2	International	Lang	27
		6	Yellow Coach	Yellow Coach	21
		5	White	Bender	25
		3	Studebaker	Studebaker	21
		2	White	White	20
		2	White	White	25
		1	White	White	17
		1	Studebaker	Studebaker	20
United Railways & Electric Co	12	5	A.C.F.	A.C.F.	30
		7	White	Bender	19
Massachusetts					
Berkshire Street Railway	4	4	Yellow Coach	Yellow Coach	21
Boston Elevated Railway	26	1	White	Farnum Nelson.	33
		1	White	Farnum Nelson.	39
		5	A.C.F.	A.C.F.	40
		†5	A.C.F.	A.C.F.	36
		5	Twin Coach	Twin Coach	37
		9	Twin Coach	Twin Coach	39
Boston, Worcester & New York Street Ry	4	3	Mack	Mack	29
		1	A.C.F.	A.C.F.	29
Eastern Massachusetts St. Ry	19	11	Studebaker	Superior	21
		8	A.C.F.	A.C.F.	40
East Taunton Street Ry	1	1	Dodge	Dodge	21
Fitchburg & Leominster St. Railway	3	3	Studebaker	Studebaker	23
Gardner Templeton St. Ry	2	1	White	Bender	29
		1	Larrabee	Boston	20
Interstate Street Ry	7	2	Twin Coach	Twin Coach	29
		3	A.C.F.	A.C.F.	29
		2	White	White	23
Middlesex & Boston St. Ry.	16	16	White	Bender	29
Plymouth & Brockton St. Ry.	3	3	Mack	Wayne	40
Springfield Street Ry	5	3	Mack	Farnham Nelson	29
		2	Yellow Coach	Yellow Coach	25
Union Street Railway	4	2	Yellow Coach	Yellow Coach	29
		2	Yellow Coach	Yellow Coach	21
Worcester Consol. St. Ry	3	1	Yellow Coach	Yellow Coach	25
		1	White	Brown	29
		1	White	Bender	25
Michigan					
Detroit Street Railway	27	25	Yellow Coach	Yellow Coach	29
		1	Dodge	Dodge	21
		†1	Twin Coach	Twin Coach	..
Eastern Michigan Railways	41	6	Yellow Coach	Yellow Coach	21
		8	A.C.F.	A.C.F.	29
		5	Fageol	Fageol	29
		2	Studebaker	Studebaker	21
		10	Yellow Coach	Yellow Coach	17
		10	Yellow Coach	Yellow Coach	33
Grand Rapids R.R.	2	2	Yellow Coach	Yellow Coach	21
Saginaw Transit Co	5	5	Yellow Coach	Yellow Coach	23
Minnesota					
Duluth Street Railway	2	2	Yellow Coach	Yellow Coach	21
Twin City Rapid Transit Co.	18	2	Will	Eckland	23
		2	Will	Eckland	29
		4	White	Eckland	29
		4	Mack	Eckland	29
		3	Mack	Lang	29
		†3	Yellow Coach	Eckland	32
Mississippi					
Mississippi Power & Light Co. (Greenville)	4	3	Dodge	Dodge	21
		1	White	Bender	15
Missouri					
City Light & Traction Co	3	3	Yellow Coach	Yellow Coach	23
Springfield Traction Co	3	3	Yellow Coach	Yellow Coach	23
St. Joseph Railway, Light, Heat & Power Co	14	4	Yellow Coach	Bender	21
		4	White	Bender	21
		6	Mack	Mack	29
Nebraska					
Omaha & Council Bluffs Street Ry	24	8	Yellow Coach	Yellow Coach	21
		8	White	Bender	29
		8	Douglas	Bender	29
New Jersey					
Atlantic City & Shore R.R.	9	9	Yellow Coach	Yellow Coach	29
Coast Cities Railway	8	4	Yellow Coach	Lang	37
		4	Yellow Coach	Yellow Coach	23

Buses Bought by Railways During 1929—(Continued)

Name of Company	Total	Total Type	Type Chassis	Body Builder	Seating Capacity
Five Mile Beach Elec. Ry...	2	2	Dodge	Dodge	21
New Jersey Interurban Co..	3	2	Hahn	Hahn	29
		1	Studebaker	Studebaker	21
Public Service Coordinated Transport	638	34	Yellow Coach	Yellow Coach	29
		94	Yellow Coach	Public Service	29
		50	Yellow Coach	Yellow Coach	39
		†161	Yellow Coach	Public Service	29
		†1	Yellow Coach	Lang	29
		†10	Yellow Coach	Lang	38
		24	Dodge	Dodge	21
		*264	Miscellaneous	.....	..
Trenton Transit Co.....	4	4	Twin Coach	Twin Coach	40
New York					
Brooklyn & Queens Transit Corp.....	24	12	A.C.F.	A.C.F.	40
		10	Twin Coach	Twin Coach	40
		2	Yellow Coach	Yellow Coach	38
Buffalo & Erie Railway.....	2	2	Mack	Fremont	21
Fonda, Johnstown & Gloversville R.R.....	5	1	Mack	Mack	20
		4	Mack	Mack	25
Hamburg Railway.....	11	7	Mack	Birney	29
		2	Mack	Whitfield	33
		2	Mack	Mack	33
Jamestown Street Ry.....	5	2	.....	.....	21
		2	.....	.....	29
		1	.....	.....	26
New York State Railways, Rochester.....	37	18	Mack	Bender	33
		5	White	Bender	33
		10	White	Bender	38
		4	Mack	Bender	29
New York State Railways, Syracuse.....	13	9	Mack	Bender	30
		1	Mack	Bender	36
		3	Yellow Coach	Bender	30
Syracuse & Eastern R.R...	1	1	Reo	Fitzjohn	29
Third Avenue Railway.....	31	12	Versare	Versare	37
		10	White	White	41
		*9	Six Wheel	Six-Wheel	29
Triple Cities Traction Co...	3	*2	White	Bender	29
		*1	Brockway	Brockway	15
United Traction Co.....	10	10	Twin Coach	Twin Coach	40
Waverly, Sayre & Athens Trac. Co.....	5	5	Yellow Coach	Yellow Coach	21
North Carolina					
Carolina Power & Light Co., Raleigh Div.....	1	1	Corbitt	Hackney	21
Durham Public Service Co.	2	2	White	White	..
North Carolina Pub. Service	1	1	Yellow Coach	Yellow Coach	21
Ohio					
Cincinnati Street Railway...	22	4	Mack	Mack	25
		10	Mack	Mack	29
		8	Twin Coach	Twin Coach	40
City of Ashtabula (Div. of Street Rys.).....	1	1	Dodge	Dodge	21
Cleveland Railway.....	25	5	Yellow Coach	Lang	38
		20	White	Lang	38
Cleveland, Southwestern Railway & Light Co.....	15	9	White	Bender	29
		1	Yellow Coach	Yellow Coach	24
		1	Schacht	Schacht	24
		3	Studebaker	Miller	12
		1	Pierce Arrow	Pierce Arrow	29
Community Traction Co...	4	4	Mack	Mack	29
Lorain Street Railway.....	3	3	Yellow Coach	Yellow Coach	21
Northern Ohio Power & Light Co.....	46	5	White	Lang	29
		41	Twin Coach	Twin Coach	40
Ohio Public Service Co.....	2	2	Yellow Coach	Yellow Coach	21
Penn-Ohio Public Service Corp.....	6	6	White	Bender	35
Pioneer Transportation Inc.	2	2	A.C.F.	A.C.F.	..
Portsmouth Pub. Serv. Co..	3	3	White	White	..
Youngstown Municipal Ry.	10	10	Twin Coach	Twin Coach	42
Oklahoma					
Oklahoma Railway.....	18	2	Sudebaker	Superior	21
		4	Dodge	Dodge	21
		6	Yellow Coach	Yellow Coach	23
		2	Yellow Coach	Yellow Coach	17
		3	Yellow Coach	Yellow Coach	21
		1	Dodge	Dodge	17
Oklahoma Union Railway..	2	2	Mack	Mack	29
Oregon					
Commission of Public Docks	1	1	Federal	Wayne	16
Portland Electric Power Co.	6	5	A.C.F.	A.C.F.	40
		1	Twin Coach	Twin Coach	40
Pennsylvania					
Allentown & Reading Traction Co.....	3	3	Mack	Mack	29
Altoona & Logan Valley Electric Railway.....	5	5	A.C.F.	A.C.F.	24
Beaver Valley Traction Co.	2	2	Yellow Coach	Yellow Coach	21
Citizens Transit Co.....	9	8	A.C.F.	A.C.F.	33
		†1	A.C.F.	A.C.F.	33
East Penn Traction Co.....	1	1	White	Bender	21
Erie Railways.....	5	5	Yellow Coach	Yellow Coach	23
Johnstown Traction Co.....	7	7	Yellow Coach	Yellow Coach	21
Lehigh Traction Co.....	3	3	Mack	Mack	29
North Branch Bus Co.....	1	1	Reo	Fitzjohn.....	21
Philadelphia & Westchester Traction Co.....	7	6	Twin Coach	Twin Coach	40
		1	White	Bender	29
Pittsburgh Railways.....	37	9	Yellow Coach	Yellow Coach	92
		5	Yellow Coach	Yellow Coach	21
		6	Yellow Coach	Lang	21
		12	White	Bender	21
		5	White	Fremont	21
Pocono Motor Coach Co...	2	2	Yellow Coach	Yellow Coach	21
Scranton Railway.....	5	2	A.C.F.	A.C.F.	23
		3	A.C.F.	A.C.F.	33
Southern Pennsylvania Traction Co.....	6	6	Yellow Coach	Yellow Coach	29
West Penn Railways.....	4	4	Dodge	Dodge	21
Westside Motor Transit Co.	1	1	Yellow Coach	Yellow Coach	17
Woodlawn & Southern Street Ry.....	6	6	Mack	Mack	29
Rhode Island					
Newport & Providence Ry..	4	4	White	White	..
United Electric Railways...	72	4	Yellow Coach	Yellow Coach	29
		37	Twin Coach	Twin Coach	37
		31	White	Bender	33
South Dakota					
Sioux Falls Traction System	10	4	Reo	Fitzjohn	21
		4	Yellow Coach	Yellow Coach	21
		2	White	Bender	15
Tennessee					
Knoxville Power & Light Co.	6	6	Yellow Coach	Yellow Coach	23
Tennessee Electric Power Co.	5	1	Twin Coach	Twin Coach	40
		2	Studebaker	Studebaker	22
		2	Studebaker	Studebaker	14
Tennessee Transp. Co.....	5	5	Studebaker	Studebaker	22
Texas					
Abilene Traction Co.....	2	2	Reo	Fitzjohn	..
Austin Street Railway.....	4	4	Dodge	Dodge	21
Dallas Ry. & Terminal Co..	16	14	Dodge	Dodge	21
		2	Dodge	Dodge	14
Eastern Texas Electric Co...	6	*4	Yellow Coach	Yellow Coach	21
		2	White	Bender	41
El Paso Electric Co.....	1	1	White	White	25
Houston Electric Co.....	9	1	Twin Coach	Twin Coach	40
		1	Mack	Mack	33
		3	White	Bender	16
		2	White	Bander	21
		1	Twin Coach	Twin Coach	21
		1	Ford	Aero Car	16
Neuces Railway.....	1	..	.....	.....	..
Northern Texas Traction Co.	17	10	Twin Coach	Twin Coach	40
		6	Reo	Reo	21
		*1	Studebaker	Studebaker	16
San Antonio Pub. Serv. Co..	14	14	Reo	Fitzjohn	22
Utah					
Utah Light & Traction Co...	9	1	Studebaker	Stevens	13
		†7	Twin Coach	Twin Coach	..
		1	Twin Coach	Twin Coach	..
Utah Rapid Transit Co.....	2	2	Pierce Arrow	Buffalo	25
Vermont					
Burlington Rapid Transit Co.....	18	9	Dodge	Dodge	21
		6	Twin Coach	Twin Coach	40
		3	White	Bender	39
Twin State Gas & Elec. Co...	1	1	Yellow Coach	Yellow Coach	21
Virginia					
Lynchburg Traction & Light Co.....	2	2	Dodge	Dodge	21
Petersburg, Hopewell & City Point Railway.....	1	1	Dodge	Dodge	21
Roanoke Railway & Electric Co.....	8	4	Dodge	Dodge	21
		4	Yellow Coach	Yellow Coach	21
Virginia Elec. & Power Co...	30	30	Twin Coach	Twin Coch	40
Washington					
Pacific Northwest Traction Co.....	4	2	A.C.F.	Newell	34
		2	A.C.F.	Newell	38
Seattle & Rainier Valley Ry.	1	1	Studebaker	Heiser	21
Tacoma Railway & Pwr. Co.	7	2	Mack	Mack	29
		4	Mack	Mack	37
		1	Mack	Mack	33
West Virginia					
Monongahela West Penn Public Service Co.....	12	2	A.C.F.	A.C.F.	29
		4	Dodge	Dodge	21
		*6	Fageol	Fageol	26
Wheeling Traction Co.....	47	3	White	Bender	29
		2	Dodge	Dodge	21
		*42	Misc.	Misc.	..
Wisconsin					
Milwaukee Electric Ry. & Light Co.....	20	7	Twin Coach	Twin Coach	35
		7	Twin Coach	Twin Coach	38
		1	Wills	Eckland	35
		5	Yellow Coach	Yellow Coach	17
Mississippi Valley Pub. Serv.	2	2	Yellow Coach	Yellow Coach	23
Wisconsin Gas & Elec. Co...	1	1	Yellow Coach	Yellow Coach	29
Wisconsin Pwr. & Lt. Co....	15	8	Yellow Coach	Yellow Coach	22
		7	Yellow Coach	Yellow Coach	24
Wyoming					
Cheyenne Motor Bus Co....	1	1	Reo	Fitzjohn	21
U. S. Possessions					
Honolulu Rapid Transit Co.	3	3	White	White	21
Manila Electric Co.....	46	..	Ford	Manila Elec.	17
		..	Chevrolet	Manila Elec.	17
		..	Dodge	Manila Elec.	17

Buses Bought by Railways in 1929—(Concluded)

Name of Company	Total	Total Type	Typs Chassis	Body Builder	Seating Capacity
Canada					
Brantford & Hamilton Electric Railway	5	5	White	Bender	29
Brantford Municipal Ry	1	1	Yellow Coach	Yellow Coach	21
Dominion Power & Transmission Co	5	5	White	Bender	29
London Street Ry	5	5	Yellow Coach	Yellow Coach	23
Niagara, St. Catherines & Toronto Ry	3	2	Yellow Coach	Fisher	21
		1	Leyland	Smith	29
Ottawa Electric Ry	2	2	Yellow Coach	Yellow Coach	28
Sherbrooke Ry. & Power Co.	2	2	Yellow Coach	Yellow Coach	21
Toronto Transportation Commission	48	5	Yellow Coach	Yellow Coach	17
		20	Yellow Coach	Yellow Coach	21
		10	Yellow Coach	Lang	33
		*13	Misc.	Misc.	30
Winnipeg Electric Co	2	1	Reo	Freemont	25
		1	Mack	Mack	33

solve the financial and service problems by extending the present lines into new territory or rerouting them through more thickly populated districts. Utilization of the bus as a feeder to existing rail arteries is now recognized as sound practice and many railway companies have come out of the red figures into the black by careful readjustment of bus and trolley services.

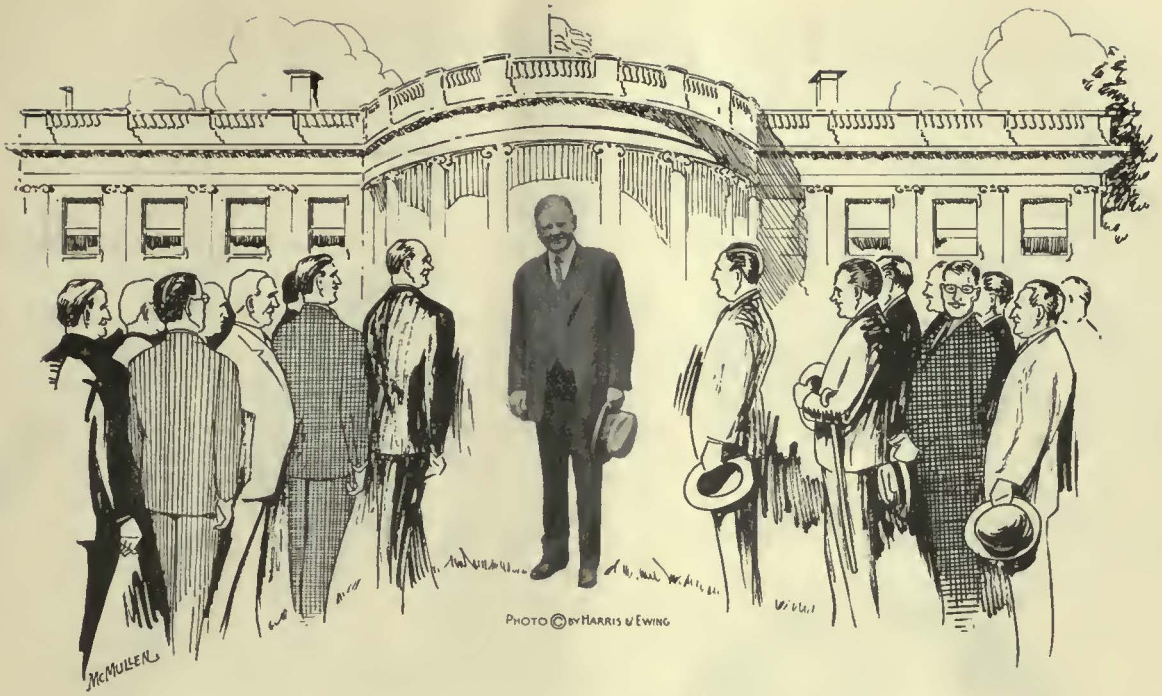
As to the type of buses purchased this year, approximately 65 per cent were of a capacity seating 29 to 40 passengers, 25 per cent had a seating capacity of from 21 to 28 passengers, and 10 per cent were of less than the 21-passenger type. Of the more than 1,800 new buses purchased, approximately 200 were of the gas-electric type. Although a large number of the buses purchased were for use on new de luxe routes, such as interurban and interstate service, many companies are now purchasing a finer type of equipment for selected city service lines. This kind of bus appeals to a new class of rider, the automobile owner, and on week ends and holidays allows a surplus of de luxe equipment for special and chartered work.

Bus Route Extensions, City and Intercity

	Miles
Alabama	
Alabama Power (Gadsden Div.)	1.15
Arizona	
Phoenix Street Railway	7.75
Tucson Rapid Transit Co	1.96
California	
Los Angeles Motor Bus Co	2.73
Los Angeles Railway	7.56
Municipal Railway of San Francisco	1.23
Pacific Electric Railway	33.20
Pacific Gas & Electric Co	1.58
Peninsular Railway	2.20
San Diego Electric Ry	2.40
Colorado	
Denver Tramway Corp	11.20
Connecticut	
Connecticut Co	46.49
Lordship Railway	3.00
Delaware	
Delaware Electric Power Co	12.49
District of Columbia	
Washington Railway & Electric Co	17.15
Florida	
Jacksonville Traction Co	22.30
Tampa Electric Co	1.10
Georgia	
Georgia Power Co	5.10
Savannah Electric and Power Co	5.80
Illinois	
Alton Railway	3.00
Chicago, North Shore & Milwaukee R.R	71.00
East St. Louis Railway	2.70
Evanston Railway	19.00
Illinois Power Co	1.06
Illinois Pwr. & Lt. Corp. (Galesburg Div.)	3.50
Illinois Power & Lt. Corp. (Quincy Div.)	3.89
Joliet, Plainfield and Aurora Trans. Co	44.00
Indiana	
Beech Grove Traction Corp	17.00
Chicago, South Shore & South Bend R.R	3.30
Indiana Service Corp	1.50
Indianapolis Street Railway	13.28
Interstate Public Service	2.50
Southern Indiana Gas & Electric Co	1.70
Terre Haute, Indianaplis & Eastern Trac. Co.	52.00
Iowa	
Clinton, Davenport and Muscatine Ry	30.00
Mississippi Valley Electric Co	1.50
Tri-City Railway of Iowa	2.75
Kansas	
Kansas City, Leavenworth & Western Ry	0.65
Kansas Power & Light Co	2.00
Wichita Falls Traction Co	1.10
Kentucky	
Kentucky Traction & Terminal Co	6.00
Kentucky Utilities Company	2.20
Louisville Ry	0.31
Louisiana	
New Orleans Public Service	5.97

	Miles
Maryland	
Potomac Edison Co	150.30
United Railways & Electric Co	15.40
Massachusetts	
Berkshire Street Ry	20.00
Boston Elevated Railway Co	84.03
Eastern Massachusetts Street Ry	30.95
Fitchburg and Leominster Street Ry	5.00
Gardner Templeton Street Ry	29.00
Middlesex and Boston Street Ry	15.59
Union Street Railway	2.00
Worcester Consolidated Street Ry	17.00
Michigan	
Eastern Michigan Railways	87.20
Minnesota	
Northern States Power Co	1.20
Twin City Rapid Transit Co	1.75
Mississippi	
Mississippi Pwr. & Lt. Co. (Greenville)	8.50
Missouri	
City Light and Traction Co	7.20
Kansas City Public Service Co	12.18
St. Joseph Railway, Lt., Heat, & Pwr. Co	6.30
St. Louis Public Service Co	3.00
Nebraska	
Omaha & Council Bluffs Street Ry	6.80
New Jersey	
Coast Cities Railway	8.70
Five Mile Beach Electric Ry	2.20
Public Service Coordinated Transport	1,108.00
New York	
Buffalo and Erie Railway	18.90
Fonda, Johnstown and Gloversville R.R	5.56
Hamburg Railway	33.00
International Railway	3.00
Jamestown Street Ry	6.40
New York & Stamford Railway	12.70
New York State Railways (Rochester Div)	26.80
New York State Railways (Syracuse Div.)	6.40
Syracuse & Eastern R.R	0.30
Third Avenue Railway	6.35
Triple Cities Traction Company	1.90
United Traction Co	5.69
Ohio	
Cincinnati Street Railway	3.20
Cleveland Railway	17.13
Cleveland Southwestern Ry. & Light Co	16.00
Columbus Railway, Power & Light Co	0.80
Community Traction Co	14.90
Northern Ohio Power & Light Co	149.26
Ohio Public Service Company	5.00
Penn-Ohio Public Service Corp	20.45
Pioneer Transportation, Inc	7.10
West End Traction Co	0.03
Youngstown Municipal Railway	5.70
Oklahoma	
Oklahoma Railway	87.18
Oregon	
Commission of Public Docks	1.50
Portland Electric Power Co	3.00

	Miles
Pennsylvania	
Beaver Valley Traction Co	0.28
Citizens Transit Company	1.40
East Penn Traction Co	8.00
Erie Railways	3.80
Philadelphia & West Chester Traction Co	1.00
Pittsburgh, Harmony, Butler & N. Castle Ry.	15.00
Pittsburgh Railways	63.25
Pocono Motor Coach Co	30.00
Scranton Railway	14.55
West Penn Railways	11.50
Rhode Island	
United Electric Railways	46.37
South Dakota	
Sioux Falls Traction System	10.28
Tennessee	
Knoxville Power & Light Co	6.15
Tennessee Electric Power Co	23.72
Tennesses Transportation Co	12.61
Texas	
Dallas Ry. & Terminal Co	9.00
Eastern Texas Electric Co	10.00
Houston Electric Co	8.39
Northern Texas Traction Co	16.85
San Antonio Public Service Co	5.08
Utah	
Utah Light & Traction Co	1.14
Vermont	
Burlington Rapid Transit Co	24.70
Virginia	
Lynchburg Traction & Light Co	0.10
Virginia Electric & Power Co	7.27
Washington	
Pacific Northwest Traction Co	28.00
Seattle Municipal Street Ry	5.10
West Virginia	
Monongahela West Penn Public Service Co.	147.77
Wheeling Traction Co	197.60
Wisconsin	
Milwaukee Electric Ry. & Light Co	35.57
Wisconsin Power & Light Co	168.00
Wisconsin Public Service	2.40
Wyoming	
Cheyenne Motor Bus Co	6.50
U. S. Possessions	
Manila Electric Co	38.07
Honolulu Rapid Transit Co	6.80
Canada	
Dominion Power & Transmission Co	11.00
Brantford & Hamilton Electric Ry	24.00
British Columbia Electric Ry	18.00
Hamilton Street Ry	1.50
Hydro-Electric Railways (Kingsville)	4.00
Hydro-Electric Railways (Windsor)	5.00
London Street Ry	3.30
Montreal Tramways	0.25
Ottawa Electric Railway	5.50
Sherbrooke Railway & Power Co	50.00
Toronto Transportation Commission	147.04
T. T. C. Radial Lines	30.20
Winnipeg Electric Co	0.92



It's *Sand* That Keeps the Wheels from Slipping

By

G. J. MacMURRAY

News Editor *Electric Railway Journal*

Atlantic City on New Jersey's shore!
Its boardwalk free, but nothing more!
To which sweet spot each year or so
A. E. R. A. decides to go
To hold a bus and street car show,
Converse and hear dear Old Bill Wise
Socratic facts clothed in disguise—
How good 'tis now this all to ponder
And then to sit at ease and wonder
When transportation's apogee will come
As a result of all that's said and done.
So once again with pen in hand
We scan the facts from all the land
To glean good cheer for all the crew
Rightly to start the year anew,
With shining thoughts for June's debate
Under Paul Shoup at the Golden Gate.

SOME TIME ago a wit remarked that in these United States too many persons were riding around in Lincolns who ought to be using Fords and that too many others were using Fords who ought to be pushing wheelbarrows. This, of course, was exaggeration for the sake of emphasis, but back of it was the scintilla of common sense so often spoken in jest. Anyway, a lot of us have learned that we have to do more than give ourselves a close shave each morning in order to be prepared for the day's grind. This ought to be encouraging to local transportation managers and disheartening to taxicab drivers. There ought to be some cheer in the fact that 1929 the local transportation industry did a gross business in excess of $1,000,000,000, but then some pessimist will arise to ask what the net was, not realizing that to a considerable degree the net depends on the individual. The pessimists are like the black little boy who stood straight and stiff and still beside the front of the house whose dead master was about to be buried. When the minister arrived, a lady whispered to this straight, still, little boy:

"Dere's de preacher. Service gwine to start now. Ain't you gwine in?"

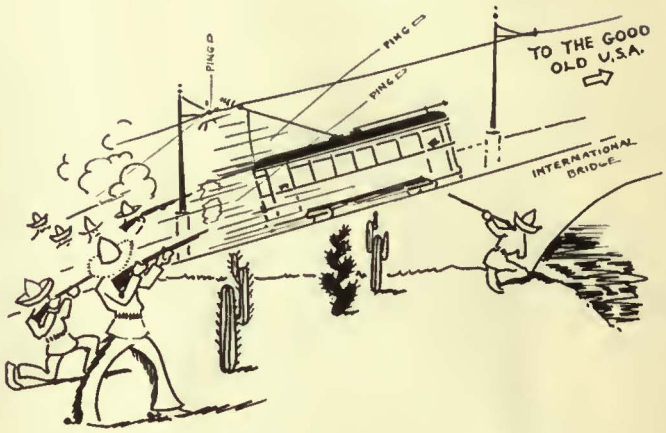
"Ah can't, mum," mumbled the boy. "Ah's de crêpe."

These fellows are the crêpe.

Crêpe and crêpehangers are all right in their place, but they haven't any place in the local transportation industry. The need is for more men conscious of their powers—more men like the Irishman at the dinner where every guest had to make a speech, sing a song or tell a story. Well, when this Irishman's time came, he said:

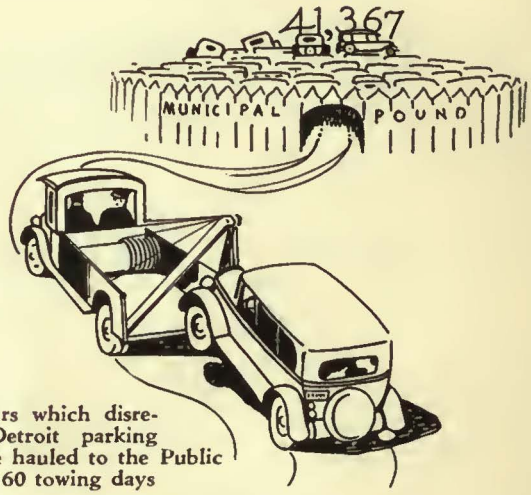
Side Lights on News Events of 1929

Taxi rate wars didn't help the taxis much. Springfield, Mass., and Philadelphia were among the cities to see the folly of unrestrained taxi operation.

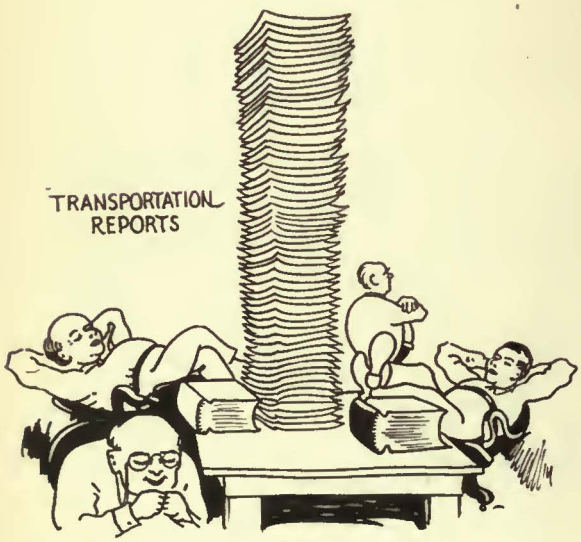


When Mexicans across the border from El Paso got careless with firearms, the cars run over the international bridge scooted for the U. S. A.

Historical and commercial subjects were included in a film of Virginia's development made by the utility at Richmond as a contribution to the state's progress.



41,367 cars which disregarded Detroit parking rules were hauled to the Public Pound in 60 towing days



City officials at Chicago sleep while reports on the transportation situation accumulate. The pile is now 6 ft. high, weighs 200 lb. and cost $1,500,000.

Los Angeles has a lot of Sunny Jims, people who realize that the increased fare allowed there is going to react to their benefit.

"Friends, I can't make a speech, or sing a song, or tell a story, but I'll fight any man in the room."

That man was conscious of his powers. Local transportation men, who do know transportation, need more of this Irishman's will to do. After all, a grapefruit is only a lemon that has been given a chance and taken advantage of it.

Statistical facts appear to indicate that the industry is very much like Hiram, Mary's beau. "Mary," began Hiram, "you know I got a clearin' over thar an' a team and wagon and some hawgs an' cows an' I calc'late on buildin' a house this fall an'—"

Just then he was interrupted by Mary's mother in the kitchen.

"Mary," she called in a loud voice, "is that young man thar yit?"

Back came the answer, "No, mar, but he's gittin' thar."

And the local transportation service is getting there. Let's look at the facts. Rail service is being modernized, buses are being co-ordinated with cars, city-wide taxicab fleets taken over, and in a few instances, airplanes used in supplemental service. The private motor remains the most serious competitor of the co-ordinated services. Buses no longer are considered as serious competitors. Most of the important urban bus lines have been absorbed by rail line managements, about 12,500 buses being operated by the electric railways in conjunction with 80,000 passenger rail cars. Most of the independent bus operators are now found running interstate service. That's how things have changed. The American drug store isn't what it used to be, and neither is the local transportation business. It would not do for a drum major to have an inferiority complex.

Charles Gordon was installed in the office of managing director

Fares are at the peak for all time, averaging approximately 8⅝ cents for the entire country. The greatest single unit of cash fare is 10 cents. Less than a score of cities have a nickel fare, and most of them are small. Where 5-cent fares obtain, special reasons are responsible. In New York, Subway deficits are paid from taxes. In New Jersey a zone ride system obtains. On the municipal system in San Francisco taxes are refunded. There are a few small cities in which the interurbans charge 5 cents within the city limits as a part of a higher fare for service outside of the town.

Wages have held an even keel, there being a change of less than ½ cent an hour during the last year. Little change in taxes is noted. Net revenue for the first six months of 1929 has been 1.75 per cent higher for the entire country than it was during 1928. This is due to increased fares. Traffic for the same corresponding period is off ¾ of 1 per cent for the entire co-ordinated systems. The total of passengers carried last year was 16,000,000,000, divided 15,000,000,000 rail cars and 1,000,000,000 buses. Expenses are 1.9 per cent lower. The number of car-miles run is off only ½ of 1 per cent.

In this business, if you're going to survive, you've just got to be undaunted and adaptable, like the piano tuner a traveler met in the West some time ago. It was the fellow traveler and not the piano tuner who was unimaginative.

"Surely," said the commiserative one, "I shouldn't imagine that pianos were very plentiful in this region."

"No, they are not," said the piano tuner, "but I make a pretty fair income tightening up barbed wire fences."

As Ed Wickwire said in Atlantic City, "Remember that Noah floated the ark when the rest of the world was in liquidation." There are some things we don't have to prove. You admit them, as the student did who was asked if he could prove that the square of the hypotenuse is equal to the sum of the squares of the legs of the triangle. Didn't Jack Shannahan on behalf of the association tell Mr. Hoover at the conference in Washington that statistics indicated that this industry was spending more than $1,000,000 a day during 1929 and probably would equal or even exceed this amount during the year 1930?

With all due respect to Mr. Wickwire, the bon mot of the Atlantic City convention was the remark by President Barnes that it was the task of the industry today to provide the bones of transportation facilities and clothe them with the flesh of service. That may not be a perfect figure of speech, but it states the idea succinctly. Incidentally, Jim Barnes showed Louisville how he proposed to carry out the idea when he exhibited his four experimental cars. Second perhaps to Mr. Barnes in the forcefulness of his remarks came Thomas N. McCarter, who said that there had been a change in the character of the service which people want, but there had been no abatement in the total demand for local transportation. Certainly he has lived up to the idea of co-ordination, one of the latest moves of his company being to take over a large bus system in southern New Jersey.

It took a whole issue of the JOURNAL and four little daily journals to tell the story of the A. C. convention. We can't afford to get started on that subject, other than to say that we hope to greet Paul Shoup, the new president, out in San Francisco next June.

So much for that. The number of interesting facts about this industry is legion. At least the JOURNAL's index makes it appear so. But nobody is ever satisfied with this review—no more satisfied than was the owner of the hen who had by mistake been fed sawdust instead of oatmeal. This hen laid twelve eggs, sat on them and when they hatched, eleven of the chickens had wooden legs and the twelfth was a woodpecker. What, for instance, can I consistently make out of the fact that the Baltimore fare case is still pending, that Los Angeles got its fare increase, that Cleveland intends to advance

Jim Barnes shows Louisville some samples

its fares, that Louisville got a fare boost, that out in Oregon the Portland Electric Power Company needs a fare advance, and that in Cincinnati the demands of outlying sections for increases in service, if granted, would jeopardize the present fares under service at cost. On cars and fares it leads me to wonder:

What is a street car? Who can say?
Its face uplifted in recent years
Fills old timer's eyes with tears
O'er the shattered ideal of the one-horse shay.

What is a street car? A faithful chariot
Entrusted to a hopeful manager's care
To be run by him from here to there
At a fare that is adequate.

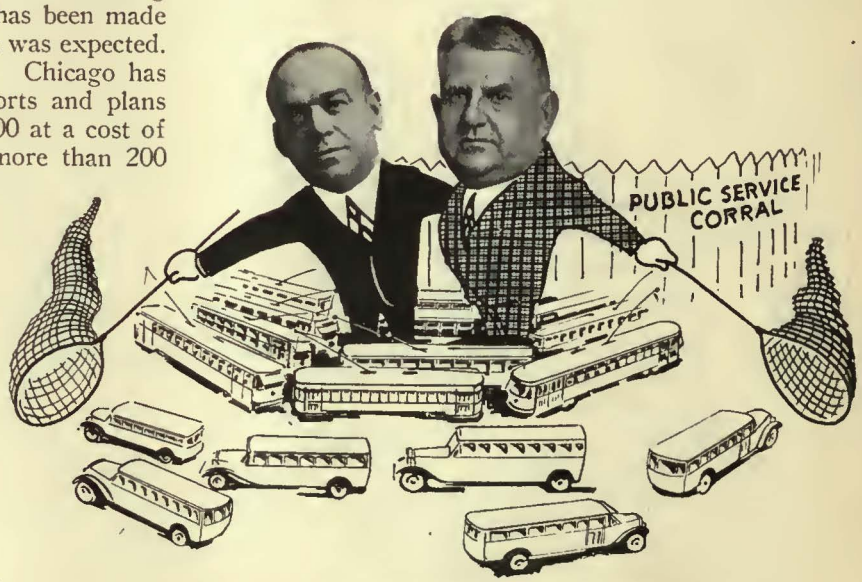
And what is the fare? Not even the prophets know.
Answer they can not, for it all depends
On what the management can achieve,
Whether the earnings may be made to show
Something left over for dividends.
That stockholders may not be left to grieve.

One of the most interesting things on fares contained in the year's news was the summary of the California Railroad Commission's report on results in that state rendered to the Commission for the District of Columbia where not only the question of fares but the matter of the consolidation of the two local railways is being agitated. In Illinois the Governor signed the bill looking toward unification in Chicago. Progress has been made in the windy city, but not to the extent that was expected. Samuel Insull lays the blame on politics. Chicago has sufficient facts to guide it. Subway reports and plans for a unified system there, made since 1900 at a cost of $1,500,000, stand 6 ft. high and weigh more than 200 lb. But Cleveland has gone right ahead. The Cleveland Railway, under Joe Alexander and the Van Sweringens, has actually developed a program of co-ordination which contemplates articulation of suburban trunk line operation, city street railway service, service by bus, transportation by taxi, and a rapid transit system. This development was the subject of a six-page story in the May issue. It is in the working out of this program that former Association Secretary Welsh will have a hand. Guy C. Hecker, who succeeded Mr. Welsh with the association, had his baptism of fire as secretary at the convention last October. St. Louis also appears to be coming along promisingly. The Transit Survey Commission there under R. F. Kelker, Jr., favors unification. If, as, and when the program is carried out, the recent purchase of the independent bus system by the holding company which controls the railway will be advantageous. There the skip-stop plan has been extended successfully by the railway. In San Francisco the purchase of the Market Street Railway by the city and the unification of that property with the lines of the present municipal railway are still under discussion, with the purchase price the chief stumbling block. Mr. O'Shaughnessy, the city engineer, did not gloss over the facts about the financial condition of the municipal railway. Seattle is still talking about articulation, regulation of taxis and what to do with the municipal railway. The municipal railway system is badly run down. It has borrowed from the water fund. Still the city raised trainmen's wages only to turn around and arrange with Stone & Webster for a two-year moratorium on the payment of the principal sum of the purchase price so as to obtain funds for rehabilitation. The Mayor hopes eventually to refinance the entire purchase on a long-term basis. The original purchase plan contemplated that the city would pay for the system out of earnings. The ills of the Seattle system are blamed on the two experiments with 5-cent fares. In other words, Seattle was to settle on the pay-as-you-go plan, but it isn't going anywhere.

While we are wandering around, there's the Detroit municipal system. The jitneys have been restrained. Service installed by the city to replace them—a service with small-capacity vehicles—seems to be highly satisfactory. City officials at Detroit are apparently undaunted by the defeat of the proposal to build a subway. In the matter of dealing with the parkers,

Detroit apparently has seen the light
And relieved itself of its traffic plight.
How it refused longer to be fooled
Was told to you by Harold Gould.

In New York the new subway to be run by the municipality is nearing completion. As Phillips put it in the New York *Sun*, the streets are so torn up for subway construction that the wags are beginning to



Messrs. McCarter and Boylan keep on gathering in the buses

speak of it as a holey city. Wisely the city decided to purchase power for the new lines rather than to attempt to generate its own current. It is this system which will be unified with the privately-owned lines if a legislative program can be enacted satisfactory to Sam Untermyer, Jimmy Walker, Tammany Hall and the officers of the railways, including President Hedley of the Interborough. Well, the surface lines in Brooklyn were brought together by a consolidation in which the Brooklyn & Queens Transit Corporation was created. Incidentally, Clint Morgan, the former chief operating official of the Brooklyn City Railroad, jumped from the management end of the business to the selling end, with the Cincinnati Car Corporation. The United States Supreme Court remanded the Interborough's suit for a 7-cent fare back to the state courts. Meanwhile, Mr. Amster, as head of the stockholders' protective committee of the Manhattan Railway, and Mr. Hedley continue their passages at arms. In Philadelphia

> On banks, trolleys, buses and cabs
> Mitten Management still keeps tabs.
> It does it quite well beyond all doubt
> For it knows exactly what it's about
> Although old Philly's daily newspapers
> Claim to have uncovered some company capers.

Mr. Storrs, the chairman of the executive committee of the United Railways & Electric Company, Baltimore, did a good stroke in arranging new financing for that company. Baltimore, too, grappled successfully with the parking problem, and a milk company ordered its drivers to respect the rights of the street cars. Buses are being run there successfully in a 25-cent service. A new franchise was awarded in Youngstown, Ohio, and in Toledo the Milner service-at-cost grant was modified.

With one or two exceptions things were quiet in the South. Employees of the New Orleans Public Service, Inc., took it into their heads suddenly to strike on Aug. 2, during negotiations looking toward a new working agreement. After being on strike many weeks, and after the company felt it could no longer keep open the offer it made for the men to return, the strikers voted to accept the company's terms. This did not happen, however, until the men had sorrowfully learned that in ignoring the good offices of President Mahon and officials of the American Federation of Labor they had followed local labor prophets into the wilderness. There was also a

Service in Cleveland is being co-ordinated under President Alexander

From Brooklyn to Cincinnati —From selling service to selling the instruments of service

little fracas in El Paso, Tex. The railway there operates over the international bridge into Juarez, Mexico. Suddenly the Mexicans staged a shooting bee. Just as suddenly the cars scooted for home, there to remain until the insurrection had died down. This incident recalls the case of the Mayor who frantically wired to the Governor for Texas Rangers, to restore peace after a reign of terror started by gunmen. A special train came down from the capital and one lonely ranger stepped out.

"Where's the rest of the outfit?" demanded the Mayor and the sheriff.

"Rest, hell," replied the ranger mildly, "you ain't got but one riot going on here, have you?"

Jack Shannahan is doing quite well in Omaha. Remember the good-natured editorial, headed "The Miracle Man," in the *Morning World-Herald*. Even the New York *Times* had a feature about him. He's been adopted into the Ogallala Sioux Indian Tribe and given the tribal name of Hounska-Kle Ska, or spotted breeches. Mr. Shannahan still has his hands full with the question of the sale of the bridge between Omaha and Council Bluffs, owned by his company, to the cities, but promise is ahead for a settlement. He has cleared up the franchise matter, and has put into effect a rerouting plan, based on the survey by Ross Harris. That's working out well now, but, as is natural in a major move of this kind, there was some dissatisfaction and much good-natured joshing at first. It so happened that on the evening of the first day of the change the Ad-Sell League met. Since some of its members were affected by the rerouting the following song was received with enthusiasm:

> "Show us the way to go home,
> We're tired and want to go to bed;
> We had a little ride about an hour ago
> But we didn't know where it led.
> We've got a dizzy dome,
> No more do we want to roam
> In Mr. Shannahan's merry-go-round
> Show us the way to go home."

The Des Moines property changed hands and the men agreed to the modification of the terms of a long-time wage agreement which contained an iron-clad clause against one-man cars. It would appear now that a program of rehabilitation for Des Moines is ahead, no less efficacious than the one now under way in Omaha. The

Omaha's miracle man is made a Sioux Indian

Roanoke Railway & Electric Company has also done some unusual things in rehabilitating its property and in selling the service to the public, notably in its house-to-house campaigns. The Boston Elevated Railway has been quick to seize the opportunities presented by the traffic problem to win back many of its passengers. In this work it has turned to advertising for assistance.

Posters and printed matter played a prominent part in putting over the idea of the Pittsburgh campaign, which was called "Loftis Testimonial Week." The slogan, "For the Love of Mike Be Careful," was reproduced on an attractive placard which was posted at all carhouses during the week.

Penn-Ohio won the Class A Safety Medal for 1929, while the Brady Award in Class B went to the Tampa Electric Company and in Class C to the Tide Water Power Company. Many other companies did effective newspaper advertising, particularly safety advertising. A very effective piece of advertising was the historical and industrial film prepared by the Virginia Electric & Power Company to stimulate home interest in Virginia and the industries of Virginia. Fred Cummings, of the Eastern Massachusetts, made a notable contribution to the subject of merchandising with his article in the issue of Sept. 14.

According to Secretary of Commerce Lamont, traffic congestion costs the nation $2,000,000,000 a year. The full story of Chicago's effort to curtail parking was told in detail by Charles Gordon in an elaborate article in the JOURNAL for Feb. 23. The victory in securing proper traffic control and in abating the parking menace is not going to be won in a day. Of course, restrictions will help, but better yet will it be when drivers realize the significance of the little poem run by the Northern Ohio Power & Light Company, Akron, in *Service News:*

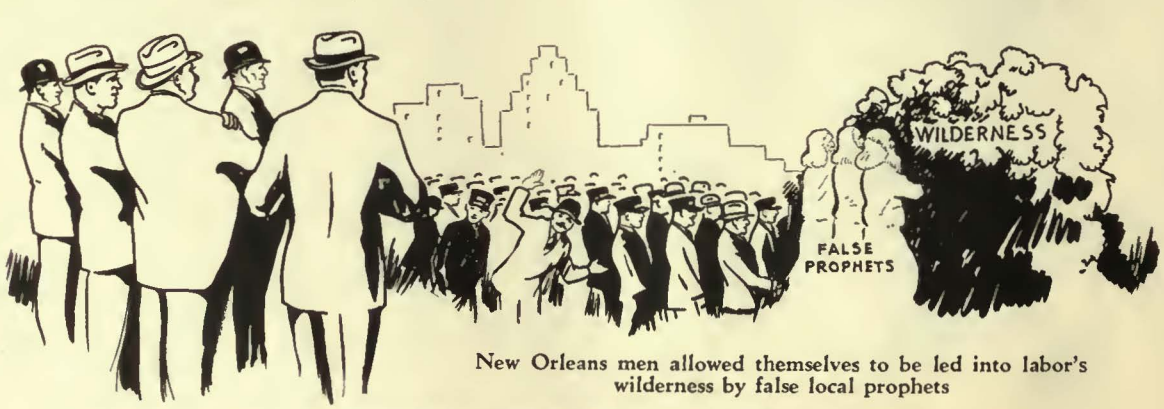
> I'm blocked in front, I'm blocked behind,
> Till I'm afraid I'll lose my mind.
> The hours that I have spent right here,
> Watching street cars pass so near,
> Have taught me what I won't forget—
> This parking business is all wet.

The Pittsburgh car was a notable contribution to the art during the year, as were the new cars for Louisville, Albany and Detroit. Comment on cars would not be complete without reference to the increase in the interest in the trackless trolley, reflected in the added installations in Salt Lake City and New Orleans, and in the numerous proposals for the use of this vehicle, notably in Chicago and Detroit.

One of the best studies of the interurban problem was the paper by Dr. Thomas Conway, president of the Cincinnati, Hamilton & Dayton Railway, entitled "Courage, Faith and Vision Will Advance Interurbans," presented at the Atlantic City convention. There have been several instances of the extension of the pick-up and delivery service by the interurbans, in the Central West and the roads on the Coast notably on the system at Los Angeles.

In most large cities, and many small ones as well, all business faces the problems of congestion and deficiency in efficient local transportation. These are community and public problems that require the application of sound principles for their solution. Electric railways are endeavoring to improve their facilities and service despite a long period of inadequate earnings and consequent restricted credit. That's preparedness for you and preparedness is merely the act of wearing spectacles to breakfast, when you know you're going to have grapefruit.

An officer once reported to Lord Kitchener that he had been unable to carry out an assigned task and gave his reason. Kitchener made this reply: "Your reason for not doing it is the best I ever heard. Now go ahead and do it." In this industry at this time it's the courage of the Vikings that's needed. It was not the Roman army that conquered Gaul, but Caesar. It was not the Carthaginian army that made Rome tremble in her gates, but Hannibal. It was not the Macedonian army that reached Indus, but Alexander. The problems of economics are not settled by oratory.



New Orleans men allowed themselves to be led into labor's wilderness by false local prophets

Rolling Stock Purchases LARGELY INCREASED

Nearly 1,300 passenger cars, 130 freight and service cars and 77 electric locomotives were bought during 1929 by the electric railways. Cars for handling heavy traffic on city surface lines predominated. Large car orders also were placed for rapid transit lines and for electrified suburban service. Interurbans purchased comparatively few new cars

By

TH. M. van der STEMPEL

Assistant Editor *Electric Railway Journal*

PURCHASES of new rolling stock by the electric railways during 1929 exceeded those of 1928 by a large amount. A total of 1,496 new cars and locomotives were bought last year as compared with 897 the year before. Included in the total for 1929 are 663 for city surface lines, 300 for rapid transit lines, 240 for electrified suburban service and 79 for interurbans. More than 130 freight and miscellaneous cars were ordered during the year just ended and 77 electric locomotives. In 1928, a total of 601 cars were bought for city surface lines and 93 for interurban service. In that year orders were placed for 171 freight and service cars and 32 electric locomotives.

A total of 58 electric railway companies are listed among the purchasers in 1929 as compared with 46 the preceding year. Of this number 49 are located in the United States and nine in Canada. Of the number of purchasers in this country 24 bought cars for city service and fifteen for interurban service. In Canada the figures are eight and two respectively. Three companies in the United States added to their equipment for electrified suburban service.

The largest single purchase of cars during the year just ended was 300 for the city-owned rapid transit lines in New York City. Next in size was the order for 141 multiple-unit cars for the electrified suburban service of the Lackawanna Railroad. Among the large orders for surface line cars placed last year were 106 for the Cleveland Railway, 101 for the Brooklyn & Queens Transit Corporation and 100 each for the Department of Street Railways, City of Detroit, and the Chicago Surface Lines. The Montreal Tramways placed an order for 50 cars, of which 25 are motorized and 25 trail. The only other order placed during 1929 for trail cars was that of the Washington, Baltimore & Annapolis Electric Railroad for nine such units, making the total for the year 34 as compared with 20 trailers ordered in 1928. The Market Street Railway of San Francisco built 25 cars in its own shops. The Lynchburg Traction & Light Company bought 20 cars for city service. Besides the purchase of passenger cars already mentioned, three orders of 15 cars each were placed during the year, one of 13 cars, seven of 10, one of 7, two of 6, five of 5, one of 4, three of 3, four of 2 and eleven orders for single cars.

Large capacity double-truck cars for two-man operation predominated in the purchases last year. The 307 cars ordered for Cleveland, Detroit and Chicago are straight two-man cars. The 25 motor cars purchased by the Montreal Tramways are designed to operate as one-man cars during non-rush hours but are used for train service at rush hours with the 25 trail cars bought by the same railway. All of the 101 cars ordered by the Brooklyn & Queens Transit Corporation are designed for one-man operation, as also were those for the Lynchburg Traction & Light Company. The other orders were divided between one-man and one-man two-man design. Only two single-truck cars were bought, one by the Third Avenue Railway and the other by the railway in Porto Rico.

Summary of Car Purchases

	United States	Canada	Total
Number of companies reporting purchase of new cars	49	9	58
CITY SERVICE			
Single truck	1	...	1
Double truck	851	86	937
Trailers	.....	25	25
Total cars for city service	852	111	963
INTERURBAN SERVICE			
Motor cars	59	10	69
Trailers	9	1	10
Express and freight	130	...	130
Miscellaneous	7	...	7
Total cars for interurban service	205	11	216
MULTIPLE-UNIT SUBURBAN CARS	240	...	240
ELECTRIC LOCOMOTIVES	77	...	77
Grand total	1,374	122	1,496

Rolling Stock Ordered During 1929

Name of Company	No.	Class	Type of Service	Motor or Trailer	Single or Double Truck	Length Over All Ft. In.	Total Weight Lbs.	Number of Motors	Seating Capacity
California									
San Francisco, Napa & Calistoga Ry.	1	Bag. & Mail	Interurban	Trailer	Double	56— 0	.....	.....	.....
Pacific Gas & Electric Co., Sacramento	12	Passenger	City	Motor	Double	41— 6½	.....	2	44
Sacramento Northern R.R.	1	Locomotive	.....	.....	.....	.....	120,000	.....	.....
Connecticut									
New York, New Haven & Hartford R.R.	10	Passenger	Suburban	Motor	Double	79— 7½	.....	4	80
Delaware									
Delaware Electric Power Co.	10	Passenger	City	Motor	Double	42— 1½	35,360	4	44
Illinois									
Chicago Surface Lines	100	Passenger	City	Motor	Double	48— 4	44,440	4	60
Illinois Traction Co.	4	Locomotives	.....	.....	.....	.....	.....	.....	.....
	100	Freight	Interurban	Trailer	Double	.....	.....	.....	.....
Indiana									
Gary Rys.	2	Passenger	Interurban	Motor	Double	44—10	40,000	4	50
Indianapolis & Southeastern R.R.	3	Passenger	Interurban	Motor	Double	45— 2	38,000	4	40
Iowa									
Des Moines Railway	10	Passenger	City	Motor	Double	.....	.....	.....	52
Fort Dodge, Des Moines & So. R.R.	1	Locomotives	.....	.....	.....	.....	150,000	.....	.....
Kentucky									
Kentucky Traction & Terminal Co.	1	Passenger	Interurban	Motor	Double	.....	.....	.....	44
Louisville Railway	1	Passenger	City	Motor	Double	43— 3	33,993	4	51
	1	Passenger	City	Motor	Double	46— 3	37,980	4	51
	1	Passenger	City	Motor	Double	41— 2½	29,000	4	47
Maryland									
Washington, Baltimore & Annapolis R.R.	9	Passenger	Interurban	Trailer	Double	58— 1	65,200	.....	58
	1	Express	Interurban	Motor	Double	55— 0	.....	4	.....
Massachusetts									
Greenfield & Montague Transportation Area	2	Passenger	Interurban	Motor	Double	39— 1½	33,000	4	44
Union Street Railway, New Bedford	12	Passenger	City	Motor	Double	44— 0	32,000	4	54
Michigan									
Department of Street Rys., Detroit	101	Passenger	City	Motor	Double	58— 5	.....	4	52
Missouri									
St. Louis Public Service Co.	1	Passenger	City	Motor	Double	.....	.....	.....	62
New Jersey									
Delaware, Lackawanna & Western R.R.	141	Passenger	Suburban	Motor	Double	71— 0	148,000	4	84
New York									
Brooklyn & Queens Transit Corp.	100	Passenger	City	Motor	Double	45— 6	34,000	4	53
	1	Passenger	City	Motor	Double	45— 0	27,500	4	52
City of N. Y. Board of Transportation	300	Passenger	City	Motor	Double	60— 6	85,000	2	60
New York Central R.R.	10	Passenger	Suburban	Motor	Double	.....	.....	2	100
	42	Locomotives	Freight	.....	.....	.....	.....	6	.....
Third Avenue Ry.	1	Passenger	City	Motor	Single	38— 9½	26,980	2	44
United Traction Co., Albany	1	Passenger	City	Motor	Double	42— 8½	32,000	4	44
Long Island R.R.	†40	Passenger	Suburban	.....	.....	.....	.....	.....	.....
North Carolina									
North Carolina Pub. Serv. Co., Greensboro	5	Passenger	City	Motor	Double	41— 5	34,200	4	41
Ohio									
Cincinnati, Hamilton & Dayton R.R.	20	Passenger	Interurban	Motor	Double	43— 9	45,000	4	44
	6	Service	Interurban	Motor	.....	.....	.....	.....	.....
	6	Freight	Interurban	Trailer	.....	.....	.....	.....	.....
Cleveland Railway	100	Passenger	City	Motor	Double	53— 6½	47,000	4	55
	6	Passenger	City	3 Duplex units	3 Trucks per unit	.....	.....	.....	100
Cleveland Union Terminals Company	22	Locomotives	Passenger	.....	.....	80— 0	204,000	.....	.....
Dayton & Troy Electric Railway	4	Passenger	Interurban	Motor	Double	45— 2	40,000	4	48
Indiana, Columbus & Eastern Traction Co.	15	Freight	Interurban	Trailer	.....	.....	.....	.....	.....
	8	Freight	Interurban	Motor	.....	.....	.....	.....	.....
Lima-Toledo R.R.	20	Passenger	Interurban	Motor	Double	.....	.....	4	44
Youngstown Municipal Railway	13	Passenger	City	Motor	Double	40— 6	30,000	4	45
†Lorain Street Railroad	10	Passenger	City	Motor	Double	41—10½	36,000	4	48
Oklahoma									
Oklahoma Railway	10	Passenger	City	Motor	Double	33— 5	26,060	4	36
Pennsylvania									
Altoona & Logan Valley Electric Ry.	5	Passenger	City	Motor	Double	42— 6	36,200	4	54
Pennsylvania Railroad	*36	Passenger	Suburban	Motor	Double	.....	.....	.....	72
	* 3	Passenger	Suburban	Motor	Double	.....	.....	.....	52
	2	Locomotives	.....	.....	.....	.....	.....	.....	.....
Pittsburgh Railways	1	Passenger	City	Motor	Double	45— 3	27,000	4	42
Scranton Railway	10	Passenger	City	Motor	Double	42— 6	35,900	4	54
York Railways	1	Passenger	Interurban	Motor	Double	.....	.....	.....	50
Tennessee									
Nashville Interurban Ry.	2	Passenger	Interurban	Motor	Double	44— 2	39,000	4	45
Virginia									
Lynchburg Traction & Light Co.	20	Passenger	City	Motor	Double	40—10	34,680	4	41
Washington									
Great Northern	4	Locomotives	Passenger	.....	.....	.....	.....	.....	.....
Yakima Valley Transportation Co.	3	Passenger	City	Motor	Double	40—10	.....	4	40
West Virginia									
Monongahela West Penn Pub. Serv. Co.	3	Passenger	Interurban	Motor	Double	47— 3	35,000	4	48
Newell Bridge & Ry. Co.	2	Passenger	City	Motor	Double	45— 3	32,220	4	46
Wisconsin									
Milwaukee Electric Ry. & Light Co.	15	Passenger	City	Motor	Double	45— 0	38,840	4	55
Wisconsin Power & Light Co.	1	Locomotive	.....	.....	.....	.....	.....	.....	.....
Porto Rico									
Porto Rico Ry., Light & Power Co.	1	Passenger	Interurban	Motor	Single	.....	.....	.....	28
DOMINION OF CANADA									
British Columbia Electric Ry.	15	Passenger	City	Motor	Double	46— 2	39,200	4	50
Calgary Municipal Ry.	6	Passenger	City	Motor	Double	46— 2	39,400	4	53
Hamilton Street Ry.	12	Passenger	City	Motor	Double	.....	.....	.....	44
Hydro-Electric Power Commission	4	Passenger	Interurban	Motor	Double	51— 2	58,000	4	50
	1	Passenger	Interurban	Trailer	Double	51— 2	44,500	.....	49
Montreal Tramways	25	Passenger	City	Motor	Double	46— 2	37,000	4	42
	25	Passenger	City	Trailer	Double	46— 2	.....	.....	57
Quebec Railway, Light & Power Co.	15	Passenger	City	Motor	Double	41— 2	38,700	4	40
	6	Passenger	Interurban	Motor	Double	65— 0	85,000	.....	37
Regina Municipal Ry.	7	Passenger	City	Motor	Double	41— 1½	34,000	4	49
Saskatoon Municipal Railway	5	Passenger	City	Motor	Double	39— 3	30,400	4	41
Winnipeg Electric Co.	1	Passenger	City	Motor	Double	.....	.....	.....	52

*Converted from steam to electric. †Motorized trailers.

As is usual, there was considerable variation in the dimensions, weights and seating capacities of the cars ordered last year. The length of the double-truck cars for city service varies between 33 ft. 5 in. and 53 ft. 6½ in., the average being about 43 ft. 6 in. Weights for this type of car range from 26,000 lb. to 47,000 lb., with an average of approximately 36,500 lb. Seating capacities vary from 36 to 62 per car. Among the interurban motor passenger cars there is less variation, the average length being about 48 ft. 8 in. with a weight of 40,916 lb. The cars purchased for New York rapid transit service have a length of 60 ft. 6 in. and weigh 85,000 lb. Even larger than these are the cars bought for the electrified suburban service of the Lackawanna Railroad, their length being 71 ft. and their weight 148,000 lb. Other additions to motorized cars for electrified suburban service are 39 cars which are being converted by the Pennsylvania Railroad from steam operation to electric operation, and 40 cars of the Long Island Railroad which are being motorized.

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	2,910	187	405	34	3,536
1923	2,915	427	595	92	4,029
1924	1,985	538	1,538	31	4,092
1925	1,054	320	238	47	1,659
1926	1,249	309	264	60	1,882
1927	824	121	363	40	1,348
1928	601	93	171	32	897
1929	963	319	137	77	1,496

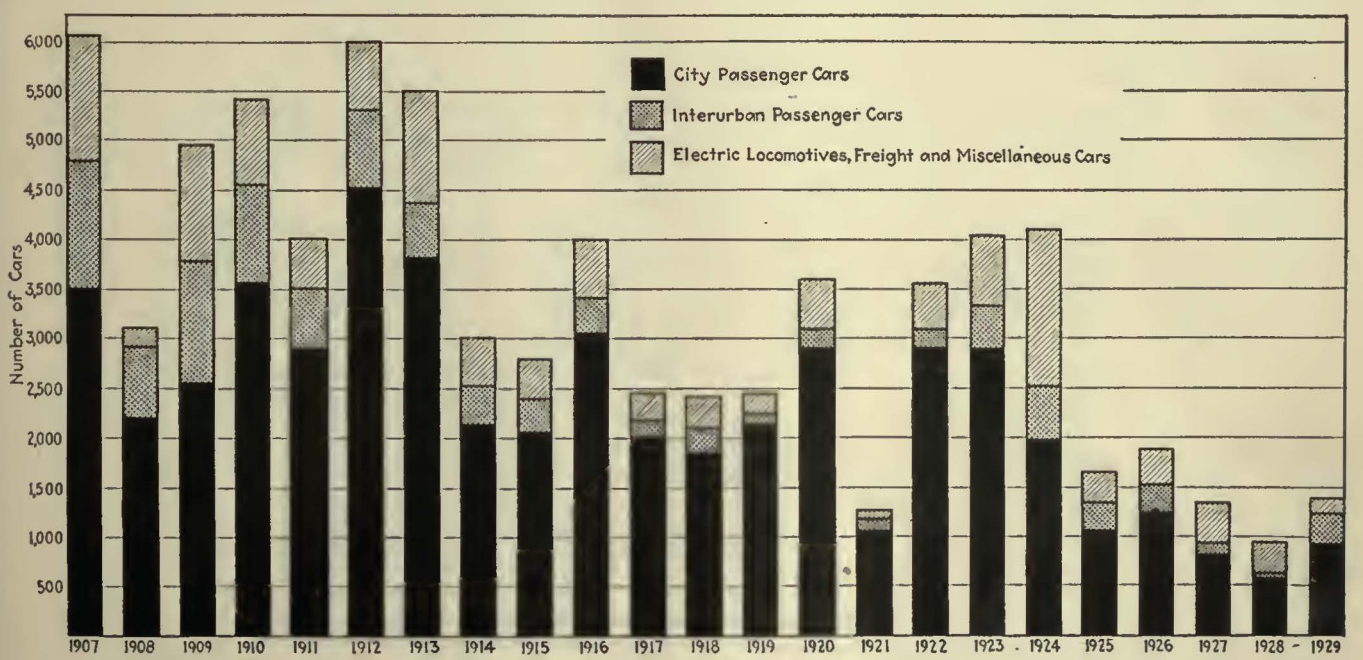
(a) Included in "Freight and Miscellaneous Cars."

Number of Cars Owned by Electric Railways by Years

Year		Passenger Motor	Passenger Trailer	Freight Motor	Freight Trailer	Locomotives	Service	Others	All Cars
1920	United States.	77,722	6,027	1,215	7,441	751	5,723	6,809	105,688
	Canada.....	4,269	136	133	612	53	53	714	5,970
	Total.....	81,991	6,163	1,348	8,053	804	5,776	7,523	111,658
1921	United States.	77,921	6,142	1,324	7,712	760	7,005	4,754	105,618
	Canada.....	4,348	138	134	538	54	67	717	5,996
	Total.....	82,269	6,240	1,458	8,250	814	7,072	5,471	111,614
1922	United States.	75,442	7,624	1,375	7,903	772	8,761	2,795	104,672
	Canada.....	4,413	312	143	575	56	168	531	6,198
	Total.....	79,855	7,936	1,518	8,478	828	8,929	3,326	110,870
1923	United States.	75,249	7,423	1,712	8,442	814	8,971	2,435	105,046
	Canada.....	4,262	365	134	646	62	213	448	6,130
	Total.....	79,511	7,785	1,846	9,088	876	9,184	2,883	111,176
1924	United States.	75,678	6,768	1,790	9,016	799	9,092	2,491	105,634
	Canada.....	4,267	364	136	642	62	212	442	6,125
	Total.....	79,945	7,132	1,826	9,658	861	9,304	2,933	111,759
1925	United States.	74,898	6,737	1,760	9,138	809	9,004	2,370	104,716
	Canada.....	4,311	367	130	637	67	232	463	6,207
	Total.....	79,209	7,104	1,890	9,775	876	9,236	2,833	110,023
1926	United States.	73,694	7,050	1,960	9,850	870	8,731	2,600	104,755
	Canada.....	3,945	368	125	629	67	313	380	5,827
	Total.....	77,639	7,418	2,085	10,479	937	9,044	2,980	110,582
1927	United States.	72,030	7,355	2,265	10,500	910	8,474	2,950	104,484
	Canada.....	3,878	354	297	618	64	382	57	5,650
	Total.....	75,908	7,709	2,562	11,118	974	8,856	3,007	110,134
1928	United States.	69,963	7,660	2,488	11,037	948	8,208	3,286	103,590
	Canada.....	3,706	364	249	472	62	419	51	5,323
	Total.....	73,669	8,024	2,737	11,509	1,000	8,627	3,337	108,913
1929	United States.	67,035	7,001	1,857	11,342	946	8,749	3,325	100,255
	Canada.....	3,831	368	244	469	65	449	49	5,475
	Total.....	70,866	7,369	2,101	11,811	1,011	9,198	3,374	105,730

New York led all other states in the amount of new rolling stock purchased for electric railway operation last year with a total of 411 cars and 42 electric locomotives. This numerical superiority was due largely to the big order for rapid transit cars and the order of 101 surface cars for Brooklyn. Ohio was second with a total of 146 cars and 26 electric locomotives. Other states which bought more than 100 cars included New Jersey, Michigan and Illinois.

At the same time that the electric railways bought these 1,404 cars, 2,325 old cars were junked or otherwise disposed of. This is by far the largest number that has been scrapped in any year of record. The next highest



Total purchases of electric railway rolling stock increased to a marked extent in 1929 over the 1928 figure

number reported was 1,853 in 1924, followed closely by 1,819 in 1928. The relative number of cars scrapped in each of the last seven years is shown in an accompanying diagram.

Interesting Developments in Design

Aside from the trends of the past year as shown by the statistics prepared in accompanying tables, interesting developments have occurred in design. Much effort has been spent by the manufacturers in the development of lighter and quieter trucks. Particular attention has been paid to securing faster acceleration and retardation. Some of the new cars equipped with high-speed motors accelerate at a rate of 3 m.p.h.p.s. and can attain a free running speed as high as 40 m.p.h. Improvements in braking have made it possible to secure a rate of retardation as high as 3½ or 4 m.p.h.p.s. without discomfort to the passenger. Foot control and automatic acceleration appear to be regarded favorably.

In several instances the cars ordered during the year

More than 2,300 old cars were scrapped in 1929, the largest number in any year of record

represent a radical departure from established precedent. While the majority of the orders are for equipment that follows more or less standard design, more attention has been given than ever before to improved general appearance. Designers have made a serious effort to create vehicles that are in keeping with their surroundings on the modern city street, but which will be an outstanding and desirable element in the picture. Attention has been directed to the balance in the general proportions, to lines and colors, to the curves of the roof, proportions of windows, shape of the ends, and to innumerable minor details that a few years ago were given little or no attention.

Greater attention also has been given to interior design and appointments, as well as to the exterior. Seats have been improved. Lines and colors have been selected to harmonize and to create a favorable impression in the mind of the rider. Care has been taken to facilitate entrance and exit, and to eliminate congestion near the doors and fare box.

Car Weights Greatly Reduced

Weights of cars purchased during the year have been reduced a great deal from the practice of a few years ago. Among the extremely light cars are one for Louisville which weighs 29,000 lb. and seats 47 passengers, or 620 lb. per passenger; the Union Street Railway of New Bedford, Mass., which weighs 32,000 lb. and seats 52 passengers, or 616 lb. per passenger; Pittsburgh Railways, weighing 27,000 lb. and seating 42 passengers, or 640 lb. per passenger; Scranton Railways, weighing 35,900 and seating 54 passengers, or 665 lb. per passenger. By far the lightest car listed is that built for the Brooklyn & Queens Transit Corporation, which, with a weight of 27,500 lb., seats 52 passengers, making the weight per passenger 530 lb.

While these examples of light-weight cars are in general sample designs, enough have been built to show that it is practicable to use in their construction those principles which have been expounded by the advocates of radical improvements. Practically all the car builders are represented in the list of these improved designs, and all the builders are using methods once considered revolutionary. Among these is the use of light-weight metals for structural parts as well as for trimmings. It is by the use of such methods that the weights have been reduced so radically.

It is not felt that the ultimate in weight reduction has been reached, by any means. Further study will make it possible not only to use light-weight metals as they have been employed in recent designs, but to modify other parts such as motors, controllers and air brake equipment to a greater extent than anything that has yet been attempted. Such changes will be possible on account of the very much lower weight of the body itself. The trucks are capable of redesign for less weight, as has been demonstrated in a few sample units. These changes in turn make it possible to increase the rates of acceleration and braking, even beyond the limits which have been referred to earlier in this article, and to do it without the necessity of having recourse to more powerful equipment.

Much Interest Shown in Special Designs

The purchase of special designs of cars has been made in larger quantities during the year just closed than in any similar period. This indicates that the interest taken in the subject is not merely a passing fancy, but that managements are becoming more and more alert to the necessity for taking advantage at once of the possibilities that lie in such changes. At the close of the year it is to be expected that more information as to the performance of these units in service will be available, and will form a basis on which to judge the merits of the several innovations incorporated in the recent designs. Such results are awaited with interest by all live operating men. It is not easy to predict in advance the exact effect of changes in design in passenger carrying vehicles but it is evident from past experience that the progress in car improvement has been productive of beneficial results.

Statistics given in the accompanying tables of rolling stock were obtained from replies to questionnaires sent to all electric railways in the United States and Canada. Replies were received from companies representing more than 97 per cent of the total track mileage. Through the co-operation of the manufacturers, lists of cars built by them during the year were furnished so that the replies received from railways could be checked very carefully. In a few cases where replies were not received from electric railways themselves, the information furnished by the car manufacturers has been used. Replies were received from all car manufacturers. In addition to the information obtained from these two sources, the files of Electric Railway Journal have been used extensively. Particular care has been used to verify figures which appeared doubtful and it is believed that the final data are complete and accurate.

Interest Revived in Trackless Trolley Operations

During the past two years this type of service has enjoyed a marked increase in popularity. More trackless trolleys were bought in 1929 than in any recent year. Seven companies are now operating 65 such vehicles. A synopsis of all operations since the first installation in 1910 is presented

DEVELOPMENTS of the past year indicate that the trackless trolley is again finding favor as a local transportation vehicle. Eight years ago it was the subject of considerable experimentation and much interest was shown in its possibilities. Numerous systems were established at the time by the railways, but abandonments during the period from 1923 to 1927 showed that it was losing popularity. With the coming of 1928, however, the manufacturers of equipment brought out new designs, resulting in a revival of interest in the trackless trolley. Indeed, the new models were so far removed from the old vehicles known as trackless trolleys that the manufacturers were reluctant to call them as such and termed them "electric coaches" and "trolley buses."

On Sept. 9, 1928, the Utah Light & Traction Company, Salt Lake City, placed ten electric coaches in service on a route 3.45 miles in length, replacing a former street car line. So successful did this original line prove to be, that the management on Dec. 4, 1929, added a second line, 4.74 miles in length, using fifteen additional vehicles.

New Orleans Established Line in 1929

A second recent installation of trolley buses in the United States is that of the New Orleans Public Service, Inc., which started a shuttle route of 1.37 miles in November, 1929, using two vehicles. Knoxville is expected to have the third installation when it opens up a route of approximately 5 miles the latter part of February or early in March, using four electric coaches.

Several other electric railways are considering installations in the near future. Of the pending plans, those of the Chicago Surface Lines to install trackless trolleys on two feeder lines in the northwest part of Chicago stand out as of particular significance. If this company obtains the desired permission to serve this district, it will purchase from 60 to 100 vehicles. Another city, in the South, is also awaiting only a court decision to start an operation of electric coaches.

It was recently announced by the general manager of the Department of Street Railways, Detroit, Mich., that he intended to propose the purchase of a number of trackless trolleys for trial purposes in that city. Should the experiment prove successful, the management plans to extend the use of trackless trolleys. Reports received by this paper from three other large properties and three smaller ones state that they are considering similar installations.

New Equipment Responsible for Renewed Interest

It has long been felt by many operators that the trackless trolley has a definite place in the field of local transportation. Until recently, however, there was a strong feeling that the equipment available was not satisfactory. As a result, only a few of the installations made with earlier equipment are now in operation. Awkward in appearance, hard riding and subject to many mechanical troubles, the early trackless trolley was a very unattractive vehicle. Development of the Versare, Twin Coach and A.C.F. Metropolitan type of buses removed the principal objections to the earlier designs, so far as the riding qualities and arrangement of equipment were concerned. At the same time light-weight, high-speed motors and control suitable for this type of vehicle became available as a result of developments in car design. Further refinements in the collection of current and the overhead removed several other objections.

Seven Railways Now Using Trackless Trolleys

At the present time seven companies are operating trackless trolleys in the United States, its possessions and Canada. These companies are operating 65 vehicles over 27.95 miles of one-way route. When service is started in Knoxville, the operating companies will be increased to eight, the number of vehicles to 69 and the mileage to approximately 33. Cities now operating are Baltimore, Md.; Philadelphia, Pa.; Rochester, N. Y.; Cohoes, N. Y.; Manila, P. I.; Salt Lake City, Utah, and New Orleans, La.

During the year 1929 a total of 20 vehicles were purchased, fourteen by the Utah Light &Traction Company, Salt Lake City; two by the New Orleans Public Service, Inc., and four by the Knoxville Power & Light Company. All of these except those for Knoxville are now in operation. Route extensions for the year totaled 6.11 miles, 1.37 miles of this being accounted for in the new line in New Orleans and 4.74 miles being the second line established by the Utah Light & Traction Company.

Of the seven companies now operating trackless trolleys, the system of the United Railways & Electric Com-

pany of Baltimore is the oldest. This line, established in July, 1922, is 6.6 miles in length and uses three vehicles, two of which are in active operation and one of which is held in reserve. They are used in feeder service between the end of a car line and a sparsely settled section in the country, known as Randallstown. Trackless trolleys were selected for this service largely as an experiment and also because of their low cost. Real estate owners in the territory to be served requested that a permanent form of transportation be installed to aid in the development of the section and the company complied with their wishes.

Philadelphia has the second oldest system in the country with a line which was established on Oct. 14, 1923. This route of 2.8 miles serves a rapidly developing industrial and residential district in the southern part of the city. Ten vehicles are used. Need for the immediate service was the reason that prompted the Philadelphia Rapid Transit Company to install the trackless trolley system on a street having steam railroad tracks. These would have required considerable time for removal before electric railway tracks could have been installed. Also, because the district was not yet fully developed, the cost of an electric railway system would have been prohibitive.

Closely following the Philadelphia installation was that of the New York State Railways at Rochester, N. Y. It established a crosstown city service through a densely populated and important industrial section on Nov. 1, 1923. Twelve vehicles are used on the 3.5-mile route. Since the line passes through a densely populated district and crosses five street car lines, the company felt that trackless trolleys would provide the most economical form of transportation.

Belt Car Line Replaced in Cohoes

On Nov. 2, 1924, the Capitol District Transportation Company, a subsidiary of the United Traction Company of Albany, started operation of a 2.53 mile route in Cohoes, N. Y., with four vehicles. The company was faced with a large expenditure for street reconstruction and paving over a considerable part of a belt line, and substituted the electric coaches for this reason. It also selected this form of transportation partly so that it could shorten the distance taken by certain lines in reaching the business center of the city. Reducing the track and paving maintenance costs was also a factor.

Immediate need for reconstructing the street car tracks on one of its lines and the high cost of gasoline in the Philippines caused the Manila Electric Company

Present Trackless Trolley Operations in the U. S., its Possessions and Canada

Company	City	Equipment Number and Type	Present One-Way Mileage	Date Started	Type of Service	Reason for Selection	Remarks
United Railways & Electric Company of Baltimore.	Baltimore, Md.	3 Brill (2 in active operation, 1 held in reserve).	6.60	July, 1922	Feeder service, between end of a car line and Randallstown, a sparsely settled section in the country.	Selected largely as an experiment and because of their low operating cost. Territory was not densely populated but real estate owners desired a permanent form of transportation.	Performance of these trackless trolleys is satisfactory.
Philadelphia Rapid Transit Company.	Philadelphia, Pa.	9 Brill B-3 type, 28 pass. 1 Berg B-4 type, 27 pass. Body by Trackless Trolley Corp.	2.80	Oct. 14, 1923	Crosstown service in south part of city, serving docks and industrial plants in rapidly developing industrial and residential sections.	Because of abandoned steam railroad tracks in street it would have taken too long to substitute street car tracks. Tidewater Docks, employing 2,000, and other plants needed service immediately. Also, territory was not sufficiently developed to warrant investment in tracks.	No supplement or curtailment since original installation. General performance has been quite satisfactory. Gas-electric bus felt to have advantage in flexibility and economy.
New York State Railways.	Rochester, N. Y.	12 Brockways, 25 pass. (Originally 5 had electric motors and 7 gasoline engines. All equipped with motors now.)	3.50 (Originally only 3.00.)	Nov. 1, 1923	Crosstown city service. Connects large industrial and residential sections on either side of a river. Crosses 5 car lines.	Economical operation principal reason.	Company satisfied with their performance.
Capitol District Transportation Company, subsidiary of United Traction Company.	Cohoes, N. Y.	4 Brockway chassis. Wason bodies.	2.53	Nov. 2, 1924	City.	Replaced belt street car line. Company was faced with larger expenditure for street reconstruction along considerable part of line. Change in route brought many residents closer to center of city. Also to reduce track and paving upkeep.	Performance satisfactory.
Manila Electric Company.	Manila, P. I.	8 Twin Coaches, 40 pass.	2.96	April, 1928	Feeder service on heavy traffic street from city limits to two street car lines which are routed to business center of city.	Replaced street cars on a line the tracks of which needed reconstructing. Economy of electric operation as compared to gasoline in Philippines influenced choice of trolley buses.	Giving satisfactory service at low costs, both operating and fixed.
Utah Light & Traction Company	Salt Lake City, Utah.	26-total. 18 Versares. 8-Twin Coaches. (7 Versares of Cincinnati Car Corporation and 7 Twin Coaches added in 1929.)	8.19 total First line 3.45 Second line 4.74	Sept. 9, 1928 Second line Dec. 4, 1929	City service in well built up residential districts and main business district of city.	Necessity of reconstructing and repaving four miles of track. Attendant future paving liabilities. Company believed electric coach to be most economic type of vehicle, at same time offering comfort and speed in a new, attractive vehicle	Company and public so pleased with first line that second was added. Operating costs low. Riding increased.
New Orleans Public Service, Inc.	New Orleans, La.	1 Twin Coach, 40 pass. 1 American Car & Foundry Motors Corp., 42 pass.	1.37	Nov., 1929	Short feeder from industrial plants in Southport, through residential district to a street car line.	Substituted for street car line. Travel too light on line to operate street cars profitably.	Not in service long enough for a report of operation.
Knoxville Power & Light Company.	Knoxville, Tenn.	4 Vereares of the Cincinnati Car Corp., ordered.	To be approximately 5 miles.	To start late in Feb. 1930, or early in March.	City.	.....	.....

to select trolley buses for the replacement of street cars on one of its lines. Although the line is a feeder, it passes through a heavily populated district, so that the company felt trolley buses would be more efficient and provide satisfactory service. Eight Twin Coaches were purchased for use on the 2.96-mile route.

As mentioned previously, the Utah Light & Traction Company placed ten Versare electric coaches in service on a 3.45-mile route in Salt Lake City on Sept. 9, 1928. The necessity of reconstructing and repaving 4 miles of track led to the investigation of the new type of vehicle. It was felt by the management that the electric coach would be the most economical type to use, and that it would also offer attractive, comfortable and speedy service. Operating costs were very low on the new line, and both the company and public were well pleased. As a result, a second line, 4.74 miles in length, was started on Dec. 4, 1929.

Like the first line, this second one serves a well built up residential district and reaches the central business district of the city. Fourteen new vehicles were ordered for the extension, seven Versares of the Cincinnati Car Corporation and seven Twin Coaches. In addition to the ten original coaches the company secured one more Versare and a Twin Coach in 1928, making a total of 12 in operation at the end of 1928 and 26 at the end of 1929.

The line established in November, 1929, by the New Orleans Public Service, Inc., is a short feeder, 1.37 miles in length, connecting several industrial plants with a street car line. Two vehicles were purchased for this service, one a Twin Coach and the other an A.C.F. The vehicles are being operated partly as an experiment, and more may be placed on lines which do not have sufficient patronage to warrant a street car line.

Late in February, 1930, or early in March, the Knoxville Power & Light Company will place four electric coaches in service on a line approximately 5 miles in length. Full details of this installation are not yet available.

Most Abandonments Caused by Poorly Designed Equipment

During the years 1921, 1922 and 1923 eight installations of trackless trolleys were made in the United States and Canada. Of this number only three are still in existence. The cities in which the operations were abandoned were New York, N. Y.; Toronto, Ont.; Minneapolis, Minn.; Windsor, Ont., and Petersburg, Va. Abandonment of earlier installations occurred in Greenwich, Conn., many years ago; in Laurel Canyon, near Los Angeles, Cal., in 1910; and in Merrill, Wis., in 1913. Little information is known about the Greenwich, Conn., installation, which, it is reported, was operated before any electric street cars made their appearance. Likewise, no definite information is available concerning the installation in Laurel Canyon in 1910. Details of all the other abandonments are known, however, and are presented in an accompanying table. It will be noted from the table that in almost every case the operations

Abandoned Trackless Trolley Operations in the U. S. and Canada

Company	City	Date Started	Type of Service	Equipment	Date Abandoned	Reasons for Abandonment	Service Substituted
.....	Greenwich, Conn.	Before trolleys were operated	.....	.....	.....	.....	.....
Pacific Electric Railway...	Laurel Canyon, near Los Angeles, Cal.	1910	.....	.....	.....	.....	.....
Merrill Railway & Light Company.....	Merrill, Wis.	Jan., 1913	City. Reached a ward on west side of city over a bridge, too light and narrow to support a street car line.	One vehicle with a 500-volt motor. Was sold to West End Street Railway, Boston.	Dec., 1913	Proved a failure.	.....
WestEnd Street Railway..	Sconticut Neck, Mass.	1916	.....	One vehicle purchased from Merrill Railway & Light Co.	1916	.....	.....
Staten Island - Midland Railway. Operated by Department of Plant and Structures, City of New York.....	Staten Island, New York, N. Y.	Oct. 8, 1921 System expanded Nov. 4, 1922	Feeders. The two original lines extended from the end of a Richmond trolley line. One, 2.6 miles long, reached a large city hospital, the second, 4.4 miles long, served a settlement called Linoleumville. Third line started in Nov., 1922, extended to Tottenville, a distance of 9 miles.	First installed 8 trolley buses by the Atlas Truck Company with G. E. equipment. 15 Brockways bought for third route.	July 31, 1927	Excessive operating costs. Worn-out equipment. Power company shut off power supply because of large debt.	Buses
Toronto Transportation Commission.....	Toronto, Ont.	Fall, 1921	City	Four	Fall, 1923	Were operated under adverse conditions and were purely experimental.	Buses
Twin City Rapid Transit Company.....	Minneapolis, Minn.	Apr. 15, 1922	City	1 Brill; 1 built by Company.	April, 1923	Operating costs excessive. Trouble with trolley poles and control, due to jarring. Residents objected to overhead. Accidents high. Restricted to fixed route.	.....
Hydro-Electric Railways...	Windsor, Ont.	May, 1922	City	Four	One line, Sept., 1923. Second, May, 1926	First because of track extension. Second, because of inflexibility.	Street cars on first. Buses on second.
Virginia Electric & Power Company. Installation by Virginia Railway & Power Company, its predecessor.....	Petersburg, Va.	June, 1923 Expanded late in 1924	Original line a feeder of 0.8 mile from a residential section to a trolley line. Later extended to business section, replacing street car line. Length 3.5 miles.	Total of five. Two for original installation.	Dec. 31, 1926	Had to pay for and operate on narrow strip of concrete in center of street. Vehicles uncomfortable. Overhead objectionable to residents and expensive to maintain. Operating costs high.	Buses

were suspended because of unsatisfactory performance of the equipment. The rapid development of the bus also was responsible for the replacement of some of these lines.

What can probably be called the pioneer trackless trolley installation in the United States and Canada was that of the Merrill Railway & Light Company, Merrill, Wis. E. S. King, president and general manager of the company, had seen a storage battery operated bus of a large department store in Chicago, and conceived the idea of building a similar bus equipped with a 500-volt motor and trolley poles, to serve a ward of the city which required transportation service. This ward was located on the west banks of the Wisconsin River and could not be reached by street car because the bridge joining this section with the main part of the city was too narrow and not strong enough to support heavy equipment. Mr. King planned to extend his trackless trolley operation if it proved successful, but abandoned the line after maintaining service during the year 1913. The vehicle was purchased by the West End Street Railway of Boston, and operated by this company for a short period at Sconticut Neck, Mass.

With much ceremony, the city of New York introduced trackless trolley transportation to the residents of two sections of Staten Island, on Oct. 8, 1921. Two lines were established, both feeding a trolley line. A total of eight trolley buses was used in this service over the 7 miles of route. On Nov. 4, 1922, the city added a third line on Staten Island, extending a distance of 9 miles and using fifteen trolley buses. Operation on all three lines was suspended on July 31, 1927, when the power company cut off its supply to the city, because of a large unpaid debt for energy consumed. The vehicles, however, were worn out and operating costs were so excessive that the city had been negotiating for some time previous for the substitution of buses.

Details of the systems established by the Toronto Transportation Commission, the Twin City Rapid Transit Company, the Hydro-Electric Railways at Windsor and the Virginia Railway & Power Company are given in the accompanying table of abandonments. Unsatisfactory equipment was responsible for most of these failures.

Many Experiments in Early Years

Tests were made by the Virginia Railway & Power Company in June, 1921, of a trolley bus manufactured by the Atlas Truck Company, with General Electric equipment, over a 1-mile route in Richmond. Later in the year the same company experimented with a trolley bus in a residential district of Norfolk. Detroit was the scene of two tests in 1921, one of a trackless trolley with a Brill body, a Packard chassis and Westinghouse equipment, and the other of St. Louis Car Company manufacture. Tests of equipment also were made in the year by the J. G. Brill Company at Philadelphia, the General Electric Company at Schenectady and the St. Louis Car Company at St. Louis. Later, experiments were made in Los Angeles in 1922, in Norfolk during July, 1923, and at Detroit in the summer of 1924. In Norfolk a Brill trackless trolley was run free to demonstrate its practicability. The Detroit tests were to compare two different types of vehicles, one a Brill, with one General Electric motor, and the other a St. Louis Car Company vehicle, with two Westinghouse motors.

It is interesting to note, through the period of these several experiments and installations, the many proposals in other cities for the installation of trackless trolleys. A few of these, selected at random, are: Greenville, Tex., April, 1921; Akron, Ohio, July, 1921; Buffalo, N. Y., August, 1921; Detroit, Mich., August, 1921; Seattle, Wash., September, 1921; St. Louis, Mo., September, 1921; Milwaukee, Wis., January, 1922; Orange, Tex., March, 1923; Toledo, Ohio, January, 1924; Detroit, Mich., April, 1924; and Albany, N. Y., September, 1924.

From the history of installations, abandonments, experiments and proposals, herewith recorded, it is not difficult to trace the cycle through which the trackless trolley has passed since its first inception. Casual experiments previous to 1921 led up to a great period of activity in the two years following. Installations made in the years from 1921 to 1923 were not entirely successful in all the cities where installed and the next few years saw a waning of popularity. During 1927, however, radically different designs of vehicles made their appearance and there followed two important installations, one at Manila, P. I., and one at Salt Lake City, Utah. At present, it appears that the trolley bus is entering upon another period of much activity. Seven companies are now operating this type of vehicle, another will begin in February or March of 1930, and a few others are planning installations in the near future. Upon the activities of the year 1930 will depend, possibly, the outcome of this type of vehicle and whether it will form for itself a definite place in the field of transportation.

Significant Figures of Past Year in Electric Railway Industry

Expenditures for new plant and equipment	**$135,470,000**
Expenditures for maintenance materials	**$100,535,000**
Expenditures for maintenance labor	**$121,450,000**
Number of new cars bought	**1,419**
Mileage of track extensions	**161.71**
Mileage of track reconstruction	**700.14**
Number of new buses bought	**1,813**
Miles of bus route extension	**3,825**

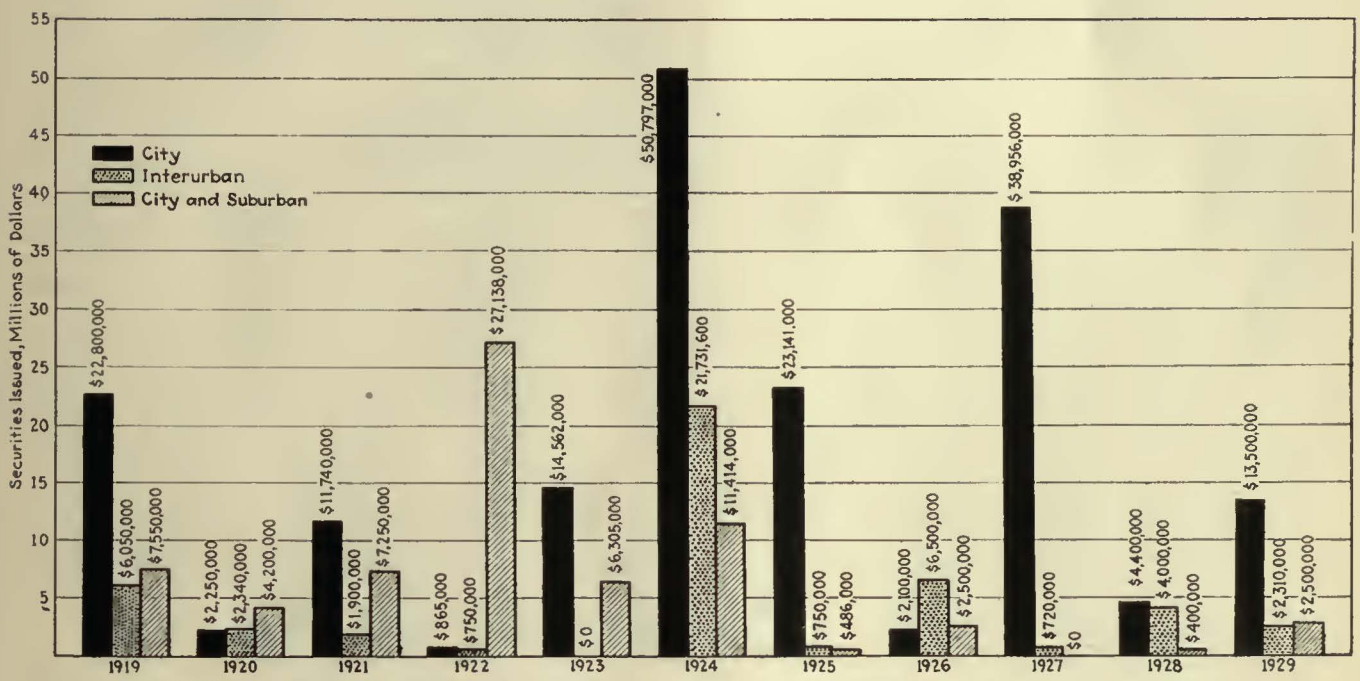
Great Improvement in Financial Situation

With restoration of the industry's credit refunding has been easier in the past year, and maturities are being taken care of on nearly all properties. The receivership status is the most encouraging for any year since the record has been kept by this paper

By

MORRIS BUCK

Engineering Editor *Electric Railway Journal*



The record of financing done by electric railways for the past eleven years shows that the needs of capital are being met adequately

FINANCIALLY speaking, to a greater extent than in any recent year the electric railway industry put its house in order during 1929. Not only was the number of receiverships entered into greatly reduced, but many roads that had been in receivership for a number of years were restored to their owners. Besides this, the total of bonds of electric railway properties in default of interest was reduced almost $40,000,000. Out of a total of $26,668,000 of securities maturing last year, $18,342,000 were retired, and $7,141,000 of bonds, maturing in 22 years or more, were called at prices ranging from 101 to 105. These are the outstanding facts of a record that has not been made by the electric railways for many years, not, in fact, since this paper has been presenting the statistics in its annual reviews.

During the year the major pieces of financing amounted to $18,310,000, as is indicated in Table I. This compares with $8,800,000 in 1928 and $39,676,000 in 1927. By far the largest single transaction in the year was that of the Brooklyn-Manhattan Transit Corporation, which placed an issue of $13,500,000 three-year secured 6½ per cent notes at 98½, or a yield of 7.06 per cent to maturity. The Insull properties placed two issues, one for the South Shore Line and one for the North Shore Line. The South Shore securities were $810,000 of 5½ per cent equipment trust certificates, and the North Shore were $1,500,000 of three-year 6 per cent notes. The latter were placed at 97¾ to yield 6.84 per cent. The other large issue was that of the United Railways & Electric Company of Baltimore. It was divided into two parts, the first being $1,500,000 of first consolidated 4's due in 1949. These bonds, which are part of an issue authorized a number of years ago, were floated at 58. The other issue was $1,000,000 of first and refunding 6½ per cent bonds due in 1957. These were sold at 80. The yields of the two issues were 8.35 per cent and 8.36 per cent respectively.

Table I—Eleven-Year Record of New Electric Railway Financing Involving Bond or Note Issues of More Than $400,000

	City Railway	Interurban	City and Suburban
1919	$22,800,000	$6,050,000	$7,550,000
1920	2,250,000	2,340,000	4,200,000
1921	11,740,000	1,900,000	7,250,000
1922	865,000	750,000	27,138,000
1923	14,562,000	.....	6,305,000
1924	50,797,000	21,731,600	11,414,000
1925	23,141,000	750,000	486,000
1926	2,100,000	6,500,000	2,500,000
1927	38,956,000	720,000	0
1928	4,400,000	4,000,000	400,000
1929	13,500,000	2,310,000	2,500,000

Table II—Comparison of Maturities in the Electric Railway Field

1930	$49,274,000	1925	$28,224,000
1929	27,316,600	1924	73,051,600
1928	47,577,200	1923	94,851,800
1927	180,798,000	1922	160,015,860
1926	26,644,790	1921	207,617,530
		1920	80,466,100

They attracted considerable attention at the time they were issued on account of being part of a mortgage authorized a number of years ago, and on account of the ease with which they were absorbed by investors.

The major portion of the financing during the past year was for city railways, principally on account of the inclusion of the Brooklyn issue. On the other hand, the interurban and combination city and suburban properties handled issues totaling approximately the average in these classifications for the past five years. This shows that it still is possible to obtain funds for the two latter classes of properties if the security is good.

In the present year the maturities will be almost double what they were during 1929. The total for 1930 as given in the table is $49,274,000, as compared with $27,316,000. With the improving position of the electric railways in the eyes of the investing public little difficulty should be involved in the refunding. No very large individual amounts are included, the largest items being the Louisville Railway consolidated 5's, $6,000,000, due in July; Newark Passenger Railway consolidated 5's, $5,849,000, also due in July, and Portland Railway, of Portland, Ore., refunding 5's, $5,870,000, due in November.

Table IV—Principal Electric Railway Maturities in 1930

(Based on Dow, Jones & Company Compilation)

	Security	Rate	Amount
January			**$2,079,000**
Syracuse Rapid Transit Co.	2nd	5	654,000
Topeka Railway	1st	5	622,000
Albany Railway	Cons.	5	428,000
Brooklyn City Railroad	Eq.Tr.A	5	375,000
February			**$3,937,500**
Chicago, North Shore & Milwaukee R.R.	3-Yr.	5½	2,500,000
Hammond, Whiting & East Chicago Ry.	1st	5	1,000,000
Philadelphia Rapid Transit Co.	Eq.Tr.G	5½	237,500
Pittsburgh Railways	Eq.Tr.	6	200,000
March			**$2,900,000**
United Railways & Electric Co. of Baltimore	3-Yr.	6	2,500,000
Berkshire Street Railway	Deb.	5	200,000
Empire Passenger Railway	1st	3½	200,000
April			**$2,179,000**
Rochester Railway	Cons.	5	2,179,000
May			**$3,332,000**
Duluth Street Railway	1st	5	2,500,000
Duluth Street Railway	Gen.	5	832,000
June			**$2,770,000**
City & Suburban Railway	1st	4	1,290,000
Detroit United Railway	Serial	6	500,000
Doylestown & Willow Grove Railway	1st	4	500,000
Pasadena & Mt. Lowe Railway	1st	4	480,000
July			**$15,641,000**
Louisville Railway	Cons.	5	6,000,000
Newark Passenger Railway	Cons.	5	5,849,000
West End Street Railway	Deb.	4½	1,604,000
Duquesne Traction Company	1st	5	1,313,000
West Liberty Street Railway	1st	5	400,000
Allentown & Kutztown Traction Co.	1st	5	250,000
Atlanta Street Railroad	1st	6	225,000
August			**$5,642,500**
Worcester Consolidated Street Railway	Ref.	6½	2,116,000
Worcester Consolidated Street Railway	Ref.	4½	1,489,000
Worcester Consolidated Street Railway	Deb.	6	1,200,000
Worcester & Southbridge Street Railway	1st	6	500,000
Philadelphia Rapid Transit Company	Eq.Tr.G	5½	237,500
September			**$2,493,000**
Hartford Street Railway	1st	4	2,493,000
October			**$1,346,000**
Pittsburgh, Allegheny & Manchester Traction Co.	1st	5	1,346,000
November			**$6,284,000**
Portland (Ore.) Railway	Ref.	5	5,870,000
Sioux Falls Traction Company	1st	6	414,000
December			**$770,000**
Detroit United Railway	Serial	6	500,000
Philadelphia Rapid Transit Company	Eq.Tr.H	5½	270,000
Total for 1930			**$49,274,000**

In the matter of securities defaulted, the year has shown a remarkable improvement. At the beginning of 1929 the total of such securities was $262,953,875. At the close of the year there were only $223,672,275 of

Table III—Disposition of Electric Railway Maturities in 1929

Company and Issue	Amount	Disposition
January	**$1,449,000**	
Interborough Rapid Transit Co. ctfs.	$450,000	Retired
New Bedford, Middleboro & Brockton St. Ry. 1st	324,000	Retired
Eastern Massachusetts St. Ry. refunding	300,000	Retired
Brooklyn City Railroad equipment trust	375,000	Retired
February	**$768,500**	
South Shore & Boston St. Ry., 1st	$331,000	Retired
Philadelphia Rapid Transit Co., equip. trust G	237,500	Retired
Pittsburgh Railways, equipment trust	200,000	No data
May	**$328,000**	
Marion City Railway, 1st	$328,000	None
June	**$250,000**	
East Side Traction Co., 1st	$250,000	Retired
July	**$1,398,000**	
Lebanon Valley St. Railway, 1st	$500,000	None
Erie Traction Co., 1st	353,000	Retired
Central Traction Co., 1st	325,000	Extended
LaCrosse City Railway, 1st	220,000	Refunded
August	**$11,028,500**	
Atlantic & Suburban Railway, 1st	$591,100	No data
Philadelphia Rapid Transit Co., equipment trust G	237,500	Retired
Aroostook Valley Railroad, 1st	200,000	Retired
Brooklyn-Manhattan Transit Co., 1 yr.	10,000,000	Retired
September	**$2,714,000**	
Wilkinsburgh & East Pittsburgh Ry., 1st	$1,989,000	Extended
Terre Haute, Indianapolis & Eastern Traction Co., clt.	425,000	Retired
Hoosac Valley Street Railway, refunding	300,000	Extended
November	**$3,570,000**	
Baltimore Traction Co., 1st	$1,500,000	Retired
Pittsburgh & Birmingham Traction Co., 1st	1,500,000	Extended
Interborough Rapid Transit Co., ctfs. C	570,000	Retired
December	**$5,162,000**	
Lynn & Boston Railroad, 1st	$2,519,000	Retired
St. Louis Electric Terminal Railway, 1st	1,724,000	Extended
Johnstown Passenger Railway, consolidated	399,000	Renewed
East McKeesport Street Railway, 1st	250,000	Extended
Philadelphia Rapid Transit Co., equipment trust H	270,000	Retired

Summary of Dispositions by Months

Month	Retired	Refunded	Extended	No Disposition	Unknown
January	$1,449,000	.....	.....	.....	.....
February	568,500	.....	.....	.....	$200,000
March	.....	.....	.....	.....	.....
April	.....	.....	.....	.....	.....
May	.....	.....	.....	$328,000	.....
June	250,000	.....	.....	.....	.....
July	353,000	$220,000	$325,000	500,000	.....
August	10,437,500	.....	.....	.....	591,100
September	425,000	.....	2,289,000	.....	.....
October	.....	.....	.....	.....	.....
November	2,070,000	.....	1,500,000	.....	.....
December	2,789,000	.....	2,373,000	.....	.....
Total	$18,342,000	$220,000	$6,487,000	$828,000	$791,100
	Grand total			$26,668,000	

Table V—New Bond and Note Financing in 1929 Offered Publicly in Amounts of More Than $250,000

Issue	Price	Maturity	Yield	Amount
Chicago, South Shore & South Bend R.R. Equipment Trust C 5½'s	.....	1930–39	....	$810,000
Brooklyn-Manhattan Transit Corporation 3-yr. secured notes, 6½'s	98.50	1932	7.06	13,500,000
Chicago, North Shore & Milwaukee R.R. 3-yr. notes, 6's	97.75	1932	6.84	1,500,000
United Railways & Electric Co. of Baltimore 1st consolidated 4's	58.00	1949	8.35	1,500,000
United Railways & Electric Co. of Baltimore 1st and refunding 6½'s	80.00	1957	8.36	1,000,000
Total	.....	.....	....	$18,310,000

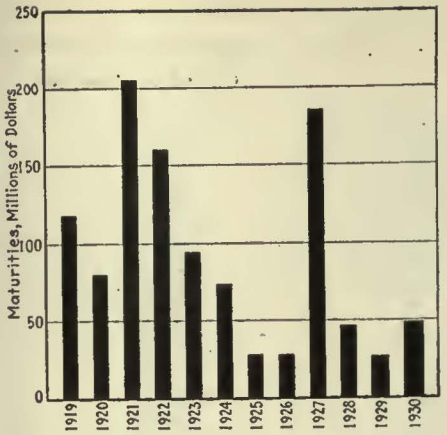
Table VI—Electric Railway Securities Called in 1929

Month	Company	Mature	Amount	Price
February	Wilmington & Philadelphia Traction Co. 5's	1963	$5,041,000	105
March	Cleveland, Elyria & Western Ry. 6's	1954	1,073,000	101
March	Wilmington City Ry. 1st 5's	1951	600,000	105
March	Cleveland & Elyria Div. 6's	1954	200,000	101
March	Cleveland, Berea, Elyria & Oberlin 6's	1954	127,000	101
March	Cleveland & Oberlin Div. 6's	1954	100,000	101

Table VII—Electric Railway Receiverships—1929

	Miles of Single Track Involved	Capital Stock	Funded Debt	Receiver's Certificates
Hammond, Whiting & East Chicago Ry., Hammond, Ind.	34.16	$1,000,000	$1,788,000	None
New York State Railways, Rochester, N. Y.	254.14	23,814,900	26,087,000	None
United Traction Co., Albany, N. Y.	112.10	12,500,000	6,500,000	None
Oklahoma Union Railway, Tulsa, Okla.	18.9	$1,500,000	$750,000	None
Sunbury & Selinsgrove Railway, Selinsgrove, Pa.	6.2	220,100	13,400	None
Total for 1929	425.50	$39,035,000	$35,138,400	None

bonds in default. The situation is the more encouraging when it is seen that included in these totals are items of $156,169,475 of bonds of the Chicago Surface Lines constituent companies, defaulted on account of the unsatisfactory political situation which prevented a renewal of the operating franchises early in 1927. As a result it was not possible to refinance and the bonds are technically in default, although interest is being paid regularly on them, and the principal undoubtedly will be paid off or refunded as soon as an agreement with the city is reached. Apart from these securities the total of defaulted bonds a year ago was $106,784,400. At the end of the year just closed the amount had been reduced to $67,602,800. In other words, more than a third of the issues in default, except for Chicago, had been adjusted. This excellent record speaks well for the soundness of the industry.

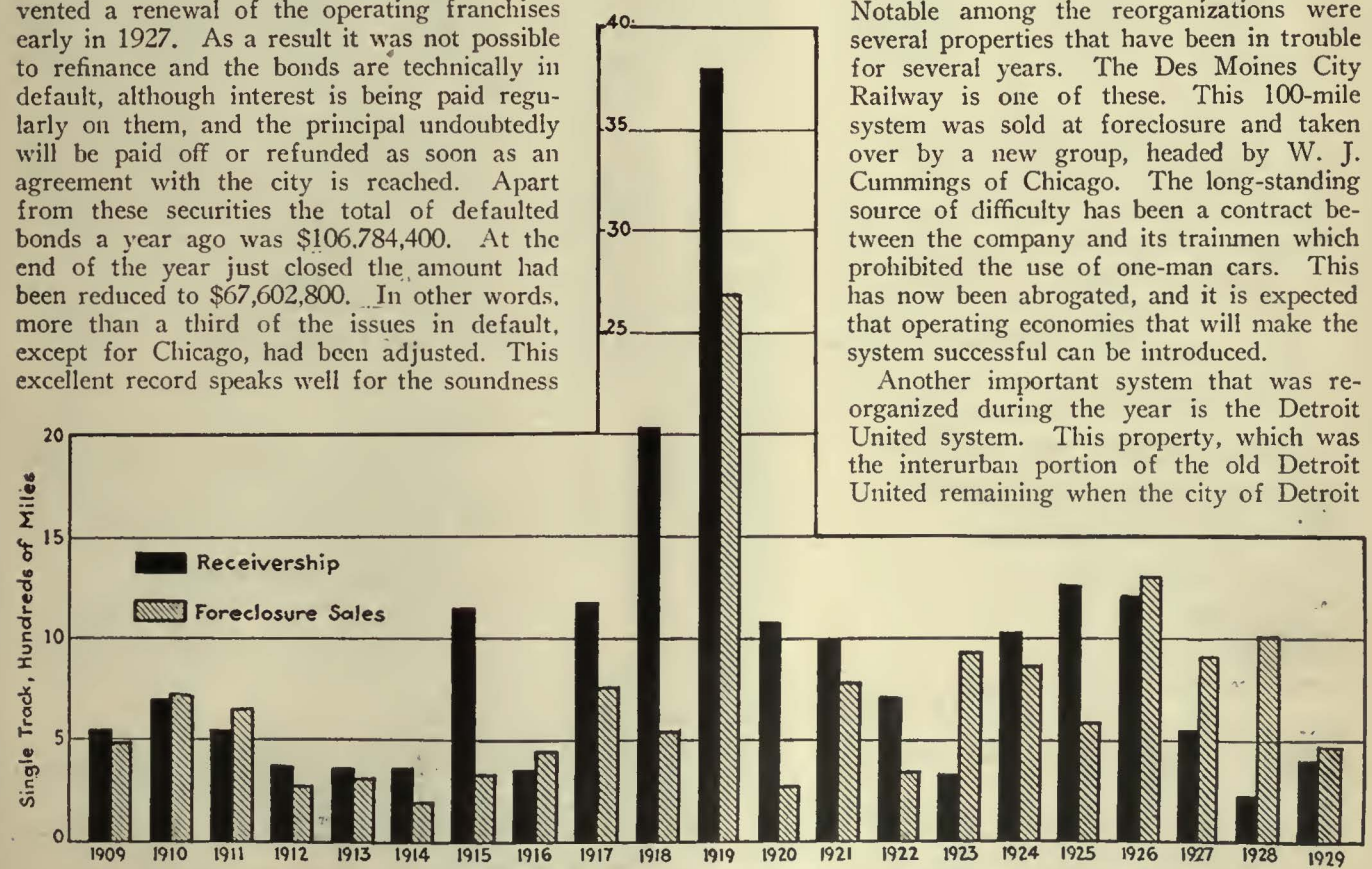


Maturities for 1930 show an increase above last year, but are relatively small in the aggregate

The receivership record of 1929 would be good at any time, but is particularly noteworthy after the record of the past twenty years. When conditions in the industry were normal, in the five years before the World War began, the receiverships averaged nineteen per year, with an average of 500 miles of track each year, and with securities averaging $24,700,000 in stock and $39,000,000 in bonds. As the war progressed the situation became worse, the 1919 record reaching the tremendous figure of 48 roads with 3,781 miles of track thrown into receivership, involving $321,000,000 of stocks and $312,900,000 of bonds. From that point the receiverships diminished gradually until only eight roads became involved in 1928. But the record for last year, when only five roads with a total of 510 miles of track, and with $18,473,000 of stocks and $21,173,700 of bonds went into the hands of receivers, is the best since 1925. It is also noteworthy that one of these roads was able to satisfy its creditors and the arrangements for ending the receivership were made during the year.

There also has been a material reduction in the number and importance of roads remaining insolvent. Notable among the reorganizations were several properties that have been in trouble for several years. The Des Moines City Railway is one of these. This 100-mile system was sold at foreclosure and taken over by a new group, headed by W. J. Cummings of Chicago. The long-standing source of difficulty has been a contract between the company and its trainmen which prohibited the use of one-man cars. This has now been abrogated, and it is expected that operating economies that will make the system successful can be introduced.

Another important system that was reorganized during the year is the Detroit United system. This property, which was the interurban portion of the old Detroit United remaining when the city of Detroit



The great improvement in the receivership situation is seen from this record covering the past 21 years

Table VIII—Outstanding Electric Railway Bonds in Default of Interest

(Based on Compilation by Dow, Jones & Company)

	Amount	Defaulted
Auburn & Syracuse Electric R.R. ref. 5's	$1,752,000	April, 1926
Bethlehem & Nazareth Railway 5's, 1929	150,000	May, 1929
Bloomfield Street Railway 5's, 1923	250,000	Aug., 1923
Brownsville Avenue Street Railway 5's, 1926	300,000	Aug., 1926
Buffalo & Erie Railway 1st 6½'s	994,000	July, 1925
Buffalo & Lackawanna Traction Company 5's, 1928	1,000,000	Dec., 1918
Calumet & South Chicago Railway 5's, 1927	5,532,000	Feb., 1927
Central Passenger Railway 6's, 1924	125,000	Oct., 1924
Chatham, Wallaceburg & Lake Erie 6's, 1925	800,000	July, 1925
Chicago City & Connecting Railways 5's, 1927	20,616,000	Jan., 1927
Chicago City Railway 1st 5's, 1927	33,926,000	Feb., 1927
Chicago Railways 1st 5's, 1927	55,655,000	Feb., 1927
Cons. A 5's, 1927	16,703,800	Feb., 1927
Cons. B 5's, 1927	17,164,475	Feb., 1927
Purch. money 5's, 1927	4,073,000	Feb., 1927
Adj. income 4's, 1927	2,500,000	Feb., 1927
Citizens Traction Company 1st 5's, 1927	246,000	Oct., 1927
Clinton Street Railway 1st 5's, 1926	400,000	April, 1926
Detroit, Jackson & Chicago Railway 5's	881,000	Aug., 1925
Evansville & Ohio Valley Railway 5's	1,034,200	Jan., 1928
Inter-Urban Railway 1st 7½'s	562,500	April, 1927
Inter-Urban debenture 6's	250,000	Jan., 1923
Kansas-Oklahoma Traction Company 6's	234,000	Nov., 1924
Key System Securities Company coll. 6's	2,500,000	July, 1929
Lakeside Railway 1st 6's	150,000	Nov., 1927
Lebanon Valley Street Railway 5's, 1929	500,000	July, 1929
Lowell & Fitchburg Street Railway 5's, 1926	275,000	Jan., 1926
Millvale, Etna & Sharon Street Railway 5's, 1923	741,000	Nov., 1923
Monongahela Street Railway 5's, 1928	993,000	June, 1928
New York & Queens County Railway 4's	1,300,000	April, 1922
New York State Railways cons. A 4½'s	13,457,000	Nov., 1929
New York State Railways cons. B 6½'s	3,000,000	Nov., 1929
Ogdensburg Street Railway 6's, 1925	150,000	Sept., 1925
Penn Street Railway 1st 5's, 1922	250,000	June, 1922
Pittsburgh & Birmingham Traction Co. 5's, 1929	1,500,000	Nov., 1929
Pittsburgh, Crafton & Mansfield 5's, 1924	171,000	July, 1924
Pittsburgh Traction Company 5's 1927	666,000	Oct., 1927
Pittsburgh & West End Passenger Railway 5's, 1922	313,000	July, 1922
Puget Sound Electric Railway cons. 5's	2,427,000	Aug., 1927
Rochester & Syracuse Railroad 5's	2,448,500	May, 1927
Salt Lake & Utah Railroad 1st 6's	1,431,900	Oct., 1925
Salt Lake & Utah Railroad conv. 7's, 1928	150,000	Oct., 1925
Seattle & Rainier Valley Railway 6's	484,000	Jan., 1928
Seattle & Rainier Valley Railway general 5's	577,500	Jan., 1928
Southwest Missouri Electric Company 6's, 1928	909,000	Sept., 1926
Southwest Missouri Railroad 5's	1,034,000	Sept., 1926
Springfield Railway 1st 5's	1,335,400	March, 1928
Steinway Railway 6's, 1922	1,500,000	July, 1922
Syracuse, Lake Shore & Northern Railroad 5's	2,496,000	May, 1927
Union Traction Company, Coffeyville, Kansas 5's	941,000	Jan., 1925
Union Traction Company of Indiana gen. 6's	4,623,000	Jan., 1925
Washington Electric Street Railway 5's, 1927	125,000	Feb., 1927
Waterloo Cedar Falls & Northern 5's	5,773,000	Jan., 1922
Webb City Northern Electric Railroad 6's, 1928	125,000	Sept., 1926
Wilkes-Barre & Hazelton Railway 1st 5's	1,761,000	May, 1929
Wilkes-Barre & Hazelton 2nd coll. 5's	1,227,000	April, 1929
Wilkinsburg & East Pittsburgh 5's, 1929	1,989,000	Sept., 1929
Youngstown & Ohio River Railroad 1st 5's	1,200,000	April, 1927
Total	$223,672,275	

Table IX—Record of Electric Railway Receiverships

Year	Number of Companies	Miles of Single Track Involved	Outstanding Securities—Stocks	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
1925	14	1,260.07	51,383,195	54,696,525
1926	16	1,228.28	17,769,435	117,560,073
1927	13	624.32	17,615,050	20,875,450
1928	8	261.95	9,216,700	14,790,700
1929	5	425.50	39,035,000	35,138,400

Table X—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	14,683
1923	15	927.45	118,077,959	110,638,250	12,265,000
1924	14	869.25	21,022,800	34,845,535	3,440,388
1925	13	569.39	18,074,300	18,329,555	53,000
1926	28	1,291.17	20,054,700	57,340,363	214,000
1927	16	940.68	53,345,000	78,445,100	3,140,000
1928	8	1,003.73	26,084,325	40,683,400	168,150
1929	10	510.38	18,472,995	21,173,700	285,359

(a) Data not available.

purchased the city lines, finally was able to work out a plan for satisfying its creditors. It now has been reorganized as the Eastern Michigan Railways. Incidentally, this was the largest road remaining in receivership at the beginning of last year, comprising 613.9 miles of track and involving $45,000,000 of securities.

The Indiana, Columbus & Eastern Traction Company, which went into receivership in 1921, finally adjusted its difficulties and was merged with the Cincinnati, Hamilton & Dayton Railway. The plan was worked out in 1928, but was not consummated until last year.

With these roads and a number of others out of

Table XI—Receiverships Terminated and Foreclosure Sales During 1929

Receivers Discharged with or without Foreclosure Sales or Following Abandonment	Miles of Single Track Involved	Capital Stock	Funded Debt	Receiver's Certificates	
Indianapolis & Cincinnati Traction Co., Indianapolis, Ind.	101.00	$3,600,000	$2,600,000	156,000	Sold at receiver's sale in 1928. Receiver disharged.
Milford & Uxbridge Street Ry., Milford, Mass.	35.00	540,000	500,000	None	Sold at foreclosure in 1927. Receiver discharged March, 1929.
Wahpeton-Breckenridge Street Ry., Breckenridge, Minn.	1.00	42,500	None	None	Receivership lifted.
Atlantic & Suburban Ry., Atlantic City, N. J.	16.00	150,000	691,000	None	Sold at foreclosure. Road sold for scrap.
Missouri & Kansas Ry., Kansas City, Kansas	20.03	1,000,000	655,000	None	Sold at foreclosure and receiver discharged.
Joplin & Pittsburgh Ry., Pittsburgh, Kansas	94.52	7,000,000	3,078,500	None	Sold at foreclosure; now operated by Joplin & Pittsburgh R. R.
Manhattan & Queens Traction Corp., Long Island City, N. Y.	20.11	20,000	None	None	Reorganized and receiver discharged.
Ogdensburg Street Ry., Odgensburg, N. Y.	4.23	150,000	150,000	None	Receivership lifted April 13, 1929.
Westchester Street R. R., New York, N. Y.	17.68	700,000	168,000	None	Sold at foreclosure in 1927 and receivership lfited September, 1929
Tulsa Street Ry., Tulsa, Okla.	23.00	800,000	None	None	Sold at foreclosure, and reorganized as the United Service Company. Receiver discharged.
Total of receiverships terminated (nine companies)	332.57	$14,002,500	$7,842,500	156,000	
Sold at Foreclosure Sale But Receiver Not Yet Discharged					
Des Moines City Ry., Des Moines, Iowa	103.10	$3,019,100	$4,821,000	None	Sold at receiver's sale.
Hammond, Whiting and East Chicago Ry., Hammond, Ind.	34.16	1,000,000	1,788,000	None	Sold at foreclosure sale.
Binghamton Ry., Binghamton, N. Y.	47.31	978,895	2,877,200	None	Sold at foreclosure and reorganized as the Triple Cities Traction Company.
Ithaca Traction Corp., Ithaca, N. Y.	12.72	400,000	763,000	25,000	Sold at receiver's sale.
Indiana, Columbus & Eastern Traction Co., Springfield, Ohio.	153.23	4,025,000	6,400,000	260,359	Sold at receiver's sale.
Lawton Railway & Light Co., Lawton, Okla.	6.31	100,000	100,000	None	Sold at receiver's sale and company out of existence.
Total foreclosure sales, receiver not discharged (six companies)	356.83	$9,522,995	$16,749,200	285,359	

receivership, the record has been greatly improved. Apart from the New York State properties, which were taken over by the courts on Dec. 30, the only system of any size remaining in receivership is the Union Traction Company of Indiana. With 445.5 miles of track and $27,300,000 of securities involved, it represents a large item in the total of receiverships at the end of the year. Various plans have been proposed for its reorganization, but up to date none of them has been accepted.

One of the most searching analyses of an industry ever made was that conducted recently for the Investment Bankers Association by its public service securities committee, and just released by the association. In general it believes in the inherent soundness of this class of properties, although it issues a warning against over-inflation of prices of some of the holding companies. On the specific subject of electric railway properties the report in part is as follows:

The street railway industry is laboring to recover its former position of prestige, to which the community benefits it confers entitle it. When the source of income of an industry is not increasing—is, in fact, too frequently decreasing—it cannot raise needed capital advantageously, and the market position of its securities suffers accordingly. Increase in fares and reduction in operating expenses have their limits; and net earnings dependent for their increase on such factors spell sooner or later an unsuccessful business. All this is unfortunate, for the street railway is an indispensable service, especially in large communities. It behooves the owner of street railway securities, and the would-be investor in them, to gage if possible the reasons for the existing situation and the possible remedies for it.

Unless the public is to take over these operations (which your committee believes to be a wrong policy to pursue), and tax the whole community for such service as it elects to give, it must change its attitude toward the street railway and recognize it as a public servant conferring definite and large community benefits, and relieve it of inequitable financing burdens. Why should a street railway pay large paving costs, and snow removal costs, for general public advantage? Why should not subway and similar costs be borne by the benefited property, as are other street improvements, for a subway is nothing but street extension? It is the fair cost of service that the car rider should pay, under careful public regulation, and not a 5-cent fare specified in some antiquated franchise, under which a service essential to public welfare cannot survive. And the public must recognize that monopoly of all the facilities of transportation under public regulation will confer wider community benefits than can a continuation of destructive competition.

On the other hand, the industry has grave responsibilities. A new point of view must be developed, both as to equipment and operating methods. Evolution in these respects has been astonishingly slow. The whole subject must be thought of in new terms. First, income must be increased—more passengers must use street cars. Present equipment is for the most part an anachronism. Cars must be made attractive, light weight, noiseless, easy to board and leave. Public taste and convenience must be catered to. This done, the great advantage of the street car rolling on a fixed track over any form of free-moving bus, in transporting multitudes of people, should make itself apparent. To all of this the American Electric Railway Association is abundantly alive, and at its convention just held in Atlantic City there was much evidence of progress in equipment—new design of cars, differential drive, worm gears and numberless devices to make the street car more attractive to passengers and the public both in appearance and performance. These efforts, the gradual restrictions on parking privileges in congested districts, and the co-ordination of the various transportation services should mean a recovery in the street railway industry.

The significance of the abandonment of track has been overestimated. Most of this has been normal; some, of course, has been forced by competition. Interurban roads particularly have suffered, as was to have been expected when the motor car appeared. Street railways are local urban enterprises and each must be studied and estimated in the light of the peculiar problems surrounding it. In some instances the investment possibilities of the securities of individual properties have not been recognized because of too

Table XII—Electric Railway Receiverships as of Dec. 31, 1929

	Year of Receiver-ship	Miles of Single Track	Capital Stock	Funded Debt	Receiver's Certificates
Illinois					
Chicago Railways, Chicago	1926	597.06	$100,000	$103,854,255	None
Peoria Railway Terminal Co., Peoria (1)	1922	25.28	$1,000,000	2,444,000	None
Indiana					
Chicago, South Bend & Northern Indiana Ry., South Bend	1927	125.00	7,500,000	4,955,500	None
Evansville & Ohio Valley Ry., Evansville	1927	42.85	>11,985	1,960,900	None
Hammond, Whiting & East Chicago Ry., Hammond, Ind. (11)	1929	34.16	1,000,000	1,788,000	None
Southern Michigan Railway, South Bend	1928	36.50	2,000,000	1,145,000	None
Union Traction Co. of Indiana, Anderson	1924	451.67	11,500,000	15,848,000	None
Iowa					
Des Moines City Ry., Des Moines (9)	1927	103.10	3,019,100	4,821,000	None
Mississippi Valley Electric Co., Iowa City	1926	6.00	538,420	148,000	None
Kansas					
Union Traction Co., Coffeyville	1927	85.00	700,000	1,150,000	None
Kentucky					
Owensboro City R. R., Owensboro	1923	11.95	75,000	400,000	None
Michigan					
Detroit & Port Huron Shore Line Ry., Detroit (8)	1925	125.00	2,000,000	2,500,000	None
Houghton County Traction Co., Houghton	1921	32.15	957,200	660,000	None
Michigan Railroad, Jackson (2)	1924	156.71	4,000,000	4,050,000	None
Minnesota					
Minneapolis, Anoka & Cuyuna Range Ry., Minneapolis	1926	29.25	300,000	284,000	None
St. Paul Southern Electric Ry., Hastings (7)	1918	17.54	658,225	364,900	12,900
Missouri					
Hannibal Railway & Electric Co., Hannibal	1927	6.50	111,165	102,500	None
Southwest Missouri R. R., Webb City	1926	90.00	5,000,000	2,341,000	None
New York					
Auburn & Northern Electric R. R., Syracuse	1928	(a)	(b)	236,000	None
Binghamton Ry., Binghamton (3)	1925	47.31	978,895	2,877,200	None
Buffalo & Erie Ry., Fredonia	1928	95.56	1,450,500	910,300	None
Buffalo & Lackawanna Traction Co., Buffalo	1918	8.80	55,000	1,000,000	None
Eighth and Ninth Avenues Ry., New York	1927	37.84	116,000*	None	None
Empire State R. R., Syracuse	1927	76.31	2,950,000	2,750,000	None
Hamburg Ry., Buffalo	1920	21.72	None	750,000	4,000
Ithaca Traction Corp., Ithaca (10)	1924	12.72	400,000	763,000	25,000
New York & Queens County Ry., Jackson Heights	1923	34.94	3,235,000	1,300,000	None
New York State Rys., Rochester, N. Y.	1929	254.14	23,814,900	26,087,000	None
Second Avenue R. R., New York (4)	1908	23.96	1,600,000	None	None
Staten Island Midland Ry., Brooklyn	1920	28.68	1,000,000	1,000,000	3,000
Steinway Ry., New York	1922	31.11	None	1,500,000	None
Syracuse, Lake Shore & Northern Ry., Syracuse	1928	(a)	(b)	2,496,000	None
United Traction Co., Albany, N. Y.	1929	112.10	12,500,000	6,500,000	None
Ohio					
Indiana, Columbus & Eastern Traction Co., Springfield (5)	1921	153.25	4,025,000	6,400,000	260,359
Springfield Ry., Springfield	1928	40.54	1,500,000	1,335,400	None
Oklahoma					
Lawton Railway & Light Co., Lawton (6)	1927	6.31	100,000	100,000	None
Oklahoma Union Railway, Tulsa	1929	18.90	1,500,000	750,000	None
Pennsylvania					
Schuylkill Ry., Girardville	1927	34.00	400,000	1,550,000	None
Sunbury & Selinsgrove Ry., Selinsgrove	1929	6.20	220,100	13,400	None
Utah					
Salt Lake & Utah R. R., Salt Lake City	1925	97.55	5,043,700	2,532,320	200,000
Washington					
Puget Sound Electric Ry., Tacoma	1928	57.10	3,116,200	7,322,000	None
Net receiverships Dec. 31, 1929	....	3,142.61	104,860,390	216,989,675	$505,259

(a) Included with Empire State R. R. figures.
(b) Information not available.
(1) Sold at foreclosure in 1927. Receiver not yet discharged.
(2) Sold at receiver's sale 1928. Receiver not yet discharged.
(3) Sold at foreclosure and reorganized as Triple Cities Traction Co.
(4) Reorganized as Second Avenue Railroad Corp. Receiver not yet discharged.
(5) Sold at receiver's sale. Receiver not yet discharged.
(6) Sold at receiver's sale. Receiver not yet discharged. Company out of existence.
(7) Sold at public auction in 1928. Receiver not yet discharged.
(8) This is the only subsidiary company of the Detroit United Ry. now operating under receivership. The Detroit, Jackson & Chicago Ry. has discontinued service and the Detroit United Ry. and the Detroit, Monroe and Toledo R. R. were sold at foreclosure and reorganized as the Eastern Michigan Rys.
(9) Sold at receiver's sale. Receiver not yet discharged.
(10) Sold at receiver's sale. Now operated by Ithaca Ry. Co., but receiver not yet discharged.
(11) Sold at foreclosure sale. Receiver not yet discharged.
*58,000 shares. No par value. Based on market quotation.

broad generalizations, though what has already been said seems too germane to the industry as a whole to be overlooked.

The aggregate figures of investment and income for the industry are impressive. They show an industry that must survive in the public interest. The new brains in the industry, looking ahead and discarding the past, will accomplish much, and may accomplish a revolution in the business if they be given time and support.

On the other hand, some unfavorable comment has been heard concerning the financial status of the industry. Only recently a spokesman for one of the investment services warned against the purchase of electric railway bonds. His words were widely circulated. They should be taken *cum grano salis,* but they certainly did not help the situation. In an appeal to bondholders of the New York State Railways and other properties for the conversion of their securities, H. C. Hopson, president of the Associated Gas & Electric Company, made a number of statements which are not reassuring to present holders and can have only a bad effect on any prospective purchasers of railway securities. The situation on the properties in New York State has been acute for some time, and culminated in their receivership a few days ago. But to generalize about the railway financial situation as a whole from the status of these companies is entirely unjustified.

As the Investment Bankers Association points out, the street railway is a much more essential service than one might be led to believe if he were to accept at face value all that the adverse commentators have said about it. Too often, far too often, the railways have been made the football of politics. This is Mr. Insull's comment in his recent penetrating remarks about Chicago. Companies with which he is identified have made a financial success not only in interurban operation, but in operation in the more moderate sized cities, the ones in which it is held that successful operation is most difficult. Not even the committee on electric railway financing of the A.E.R.A., which reported several years ago after an extended investigation, sought to mitigate the condition which exists of a need for recasting of financial structures of many properties. It is regrettable that more companies have not followed out these recommendations, but the comments of Mr. Hopson and others may properly be characterized as representing the extreme point of view. It is more nearly true, as Mr. Insull said of the Chicago situation, that with proper set-up of the financial plan, founded on true economic principles, money necessary will pour in from securities, both senior and junior—bonds, preferred and common stock.

Much Construction Work Features Heavy Electric Traction in 1929

CONSTRUCTION work on projects already authorized occupied the major attention of electrification engineers during the year just past. The conversion has continued at a rate foreshadowed by the announcements made public during 1928. While comparatively little track was opened to electric operation during the year, the present year will witness the fulfillment of many of the projects under way.

Chief among the installations being made is that of the Pennsylvania Railroad, which is actively at work on extension of its electric system to cover the territory between New York and Washington. The section between Philadelphia and Wilmington is now using electric power for local service over 52.6 miles of route. The sections comprising the line between Philadelphia and New York will follow next. The obstacle to electrification of the line between Wilmington and Washington, the series of tunnels in Baltimore, has now been removed by the action of the city to permit the construction of new tunnels to supplement the present ones. In all a total of 325 miles of route and 1,300 miles of track has been authorized. Following the completion of the New York-Washington line, it is rumored that the Pennsylvania will proceed at once with preparations for the electrification of the route over the Allegheny Mountains between Philadelphia and Pittsburgh, a project which has been considered for years.

The Cleveland Union Terminal Company has virtually completed the equipment of the new terminal at the Public Square in Cleveland and the approaches of the several roads entering it, so that electric operation will begin in the immediate future.

The Delaware, Lackawanna & Western Railroad is making rapid progress with the conversion of its suburban lines out of New York for electric service. The construction is well under way and the equipment is on order. The work probably will be completed during the present year.

The Reading Company is proceding with plans for the electrification of its Philadelphia terminal and the suburban lines running out of it. The authorization was made late in 1928, and construction work is just beginning.

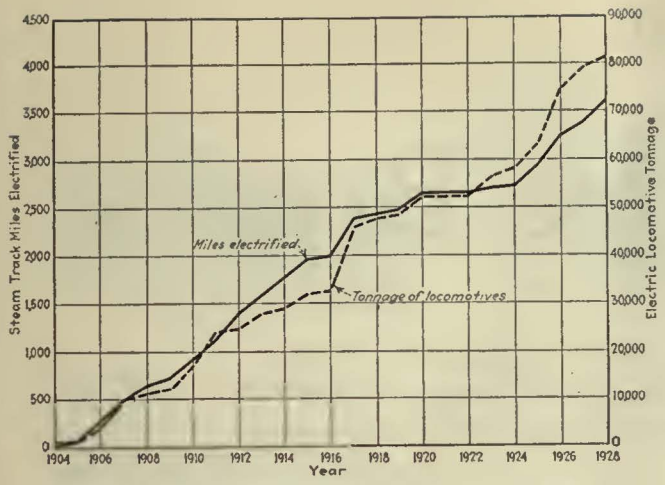
Steam Railroad Electrification Reported for 1929

	Miles of Track
Cleveland, Cincinnati, Chicago & St. Louis Railroad, Cleveland	4.25
Cleveland Union Terminals Company, Cleveland	4.01
Illinois Central Railroad, Chicago and vicinity	25.88
Long Island Railroad, New York and vicinity	9.23
New York Central Railroad, Cleveland	3.51
New York Central Railroad, New York and vicinity	2.46
New York, Chicago & St. Louis Railroad, Cleveland	5.32
New York, New Haven & Hartford Railroad, New York and vic'ty	1.59
Pennsylvania Railroad, Philadelphia-Wilmington	150.06
Virginian Railway, Roanoke, Va.-Mullens, W. Va.	0.13

While the construction work was completed in 1928, electric operation of the new tunnel of the Great Northern Railway through the Cascade Mountains was opened in January of last year. This replaces the former short electrification of the old tunnel, and brings the electrified track on this system up to 87.5 miles.

During the year extensions to the Illinois Central electric zone in Chicago were made totaling 25.88 miles. This road also ordered four electric locomotives for freight switching in the Chicago terminal division. Figures for extensions to electrified track are given in one of the tables.

Among the new projects which have been discussed during the past year the outstanding one is that of the New York Central. Plans have been prepared in some



Mileage of Steam Railroads Electrified and Total Weight of Active Electric Locomotives in Tons

As reported by Committee on Heavy Electric Traction, A.E.R.E.A.

detail for the electrification of the system between New York and Buffalo. This is a section of dense traffic which ultimately, it is said, will have to be powered with some form of energy other than steam. No definite announcements have been made, but it is understood that the work as planned will cost in the neighborhood of $150,000,000.

The Lehigh Valley Railroad has received bids from the leading electrical manufacturers on the equipment of 75 miles of route of its main line between Mauch Chunk and Wilkes-Barre, Pa. The cost of this project would be between $7,000,000 and $10,000,000, and would assist traffic on the ruling grades of the system. The section is through mountainous territory, and the use of electricity would make possible the movement of more and longer trains at greater speed than is possible with steam.

In foreign countries the progress in electrification is in line with that in this country. The Central Argentine Railway was authorized in 1929 to proceed with the extension of its suburban electrification out of Buenos Aires. The new project involves a total of 26 miles. The Central Terminal Railway of Buenos Aires is constructing 5½ miles of double-track subway into the main business district of the city, with the intention of operating its passenger trains to a new terminal to be built in the business district.

The New South Wales Government Railway is converting to electric traction its suburban services at Sydney. It is expected that the project, involving about 400 track-miles, will be completed this year.

Work is in progress on the electrification of the divisions of the Great Indian Peninsula Railway between Kalyan and Poona and Igatpuri. With the main line from Bombay to Kalyan already completed, the total electrification will comprise about 180 miles of route.

Electrifications are also planned in the Netherlands, Sweden, Germany, Italy, France and Spain. In England and Austria plans have been deferred for economic reasons. The principal Swiss railways already have been converted to electric operation, and comparatively few lines demand a change to electric power at present.

Installations of Electrical Operation of Steam Railroads in the United States

Based on original data, supplemented by reports of the American Electric Railway Engineering Association and the National Electric Light Association

Railroad—Location	Electric Mileage		System			Year Electrified	Electric Locomotives		Motor Cars	Daily Trains		Annual Car-Miles	
	Route	Track	Volts	Cycles	Contact Line		Pass.	Freight		Pass.	Freight	Pass.	Freight
Baltimore & Ohio—Baltimore, Md.	3.6	9.1	675	d.c.	Rail	1895	12	*a*	0	13	21	142,590	1,297,900
Boston & Maine—Hoosac Tunnel, Mass.	7.9	21.4	11,000	25	Over'd	1911	*a*	7	0	12	28	215,172	3,868,065
Butte, Anaconda & Pacific—Butte-Anaconda-Rocker, Mont.	37.4	145.8	2,400	d.c.	Over'd	1913	1	27	0	4	6	117,457	5,079,040
Chicago, Milwaukee, St. Paul & Pacific—Harlowton, Mont.-Avery, Idaho	440.1	578.0	3,000	d.c.	Over'd	1916	9	27	0	4	.....	6,553,898	52,190,990
Othello-Tacoma-Seattle, Wash.	218.4	305.4	3,000	d.c.	Over'd	1920	5	15	0	4	.....	3,810,520	15,810,893
Great Falls, Mont. (Yard)	0.0	6.9	1,500	d.c.	Over'd	1915	.....	.....	.....	.....	.....	.....	.....
Gallatin Valley Branch	18.8	24.8	600	d.c.	Over'd	.....	.....	1	1	.....	.....	.....	.....
Cleveland Union Terminal—Cleveland, Ohio	18.8	40.0	3,000	d.c.	Over'd	*a*	22	0	0	.....	.....	.....	.....
Delaware, Lackawanna & Western—Hoboken-Dover-Gladstone, N. J.	70.0	160.0	3,000	d.c.	Over'd	*b*	.....	.....	141	.....	.....	.....	.....
Detroit, Toledo & Ironton—Fordson-Flat Rock, Mich.	16.6	50.0	22,000	25	Over'd	1926	0	2	0	0	8	.....	.....
Erie—Rochester-Mt. Morris, N. Y.	34.0	38.0	11,000	25	Over'd	1907	0	0	8	20	0	535,000	0
Ft. Dodge, Des Moines & So.—Ft. Dodge-Rockwell, Iowa	146.6	195.1	1,200	d.c.	Over'd	1912	0	12	13	8	12	275,000	2,585,657
Grand Trunk (Canadian National)—Port Huron, Mich.-Sarnia, Ont.	3.7	12.2	3,300	25	Over'd	1908	0	9*e*	0	9	4	127,367	2,532,176
Great Northern—Skykomish-Wenatchee, Wash.	72.8	87.5	11,500	25	Over'd	1929	5*e*	5	0	8	4	.....	.....
Illinois Central—Chicago-Richton, Ill.	37.8	152.1	1,500	d.c.	Over'd	1926	0	0	140	552	0	10,814,046	0
Long Island—New York, N. Y.	122.8	361.4	650	d.c.	Rail	1905*c*	7	8	742	895	8	42,914,621	.....
Bay Ridge-Fresh Pond Jc., N. Y.	11.9	84.4	11,000	25	Over'd	1927	0	7	0	0	30	0	.....
Michigan Central—Detroit, Mich-Windsor, Ont.	4.5	28.6	650	d.c.	Rail	1910	12*e*	.....	0	38	47	474,530	1,728,084
New York Central—N.Y.-Croton-White Plains, N.Y.	63.1	330.1	650	d.c.	Rail	1906*c*	83	9	336	505	45	23,391,989	.....
New York, New Haven & Hartford—Nantasket Jc.-Pemberton, Mass.	6.9	16.2	650	d.c.	R&O	1895	0	0	8	36	0	.....	0
Providence, R. I.-Fall River, Mass.	23.9	38.6	650	d.c.	Over'd	1901	0	0	22	42	0	702,382	0
Woodlawn, N. Y.-New Haven, Conn. *f*	75.2	519.6	11,000	25	Over'd	1907*c*	71	73	65	190	44	24,523,377	53,000,000
Stamford-New Canaan, Conn.	7.9	9.8	11,000	25	Over'd	1908	*g*	*g*	*g*	32	2	*g*	*g*
S. Norwalk-Danbury, Conn.	23.7	31.0	11,000	25	Over'd	1925	*g*	*g*	*g*	8	6	*g*	*g*
Port Morris-Fresh Pond Jc., N. Y. *h*	9.0	26.3	11,000	25	Over'd	1918*c*	*g*	*g*	*g*	18	21	350,000	9,149,807
Norfolk Southern—Norfolk-Virginia Beach, Va.	44.5	54.3	575	d.c.	Over'd	.....	2	.....	19	.....	.....	.....	.....
Norfolk & Western—Bluefield-Iaeger, W. Va.	63.7	209.1	11,000	25	Over'd	1915*c*	0	16	0	.....	34	.....	.....
Northwestern Pacific—Corte Madera-Sausalito, Cal.	20.6	40.4	600	d.c.	Rail	.....	.....	.....	44	.....	.....	.....	.....
Pennsylvania—Camden-Atlantic City, N. J.	75.0	150.1	650	d.c.	Rail	1906	0	0	107	48	0	3,310,533	0
New York, N. Y.-Manhattan Transfer, N. J.	13.4	103.7	675	d.c.	Rail	1910	46	0	0	200	0	.....	0
Philadelphia-Paoli-Chestnut-Hill, Pa.	36.2	129.8	11,000	25	Over'd	1915*c*	1	0	158	172	0	4,253,055	0
Philadelphia, Pa.-Wilmington, Del.	52.6	140.3	11,000	25	Over'd	1928	0	0	123	75	0	615,580	0
Reading—Philadelphia, Pa. and suburbs	.....	.....	11,000	25	Over'd	*d*	.....	.....	.....	.....	.....	.....	.....
Southern Pacific—Oakland-Alameda-Berkeley, Cal.	50.0	118.8	1,200	d.c.	Over'd	1911	0	3	87	780	0	4,022,617	0
Virginian—Roanoke, Va.-Mullens, W. Va.	134.0	229.8	11,000	25	Over'd	1925*c*	0	14	0	0	19	0	29,120,883

a To be completed in 1930. *b* To be completed in 1931. *c* Includes extensions in subsequent years. *d* Under construction. *e* Passenger and freight. *f* Operates on New York Central between Woodlawn and Grand Central Terminal, New York. *g* Included in Woodlawn-New Haven section. *h* New York Connecting R.R.

Low Records Made in

Trolley Wire Breaks

Continued improvement over previous figures was shown in 1929. Survey shows average reduction of more than 60 per cent accomplished during past eight years

DATA compiled by various of the leading electric railway systems in the United States and Canada show that the number of trolley wire breaks per year is steadily decreasing. Notable achievements in this direction have been made by the railways in Chicago, Detroit, Cleveland, Baltimore, Boston, Birmingham, Louisville, New Orleans and Toronto. Although the number of car-miles operated has remained practically constant for the group of properties included in this survey, the number of breaks has been reduced more than 60 per cent during the past eight years.

Reasons for failure can be classified under two main headings, namely, those due to uncontrollable causes and those due to inherent characteristics. Among the uncontrollable causes are burnouts by shovels, grinders, welders, foreign wires, and fires, while the causes of inherent failures are such as worn wire, defective fittings, burnt spots, crystallization or fatigue, flaws in wire and worn fittings. Reductions have been made under both classifications by systematic inspection and maintenance methods.

Differentiation between so-called uncontrollable causes and defects and wear varies somewhat on different properties. According to the classifications used in Boston, Detroit and Cleveland it appears that slightly more breaks are due to defects and wear than to uncontrollable causes, the ratio being about 60-40. Figures for breaks occurring on these properties in 1928 are summarized in the following table:

Causes of Trolley Wire Breaks

	Boston	Detroit	Cleveland	Total	Per Cent
Defects and wear.....	45	38	8	91	58
Uncontrollable.....	23	22	20	65	42
Total.....	68	60	28	156	100

Regular inspections are made either on a time basis or on the basis of the number of car passes. In Baltimore, for example, the entire overhead system is inspected once a month. In Chicago inspection is made after approximately 60,000 car passes and in Cleveland after 50,000. On lines where cars operate on a short headway this results in comparatively frequent inspection, while on the less heavily traveled lines the period between inspections is longer.

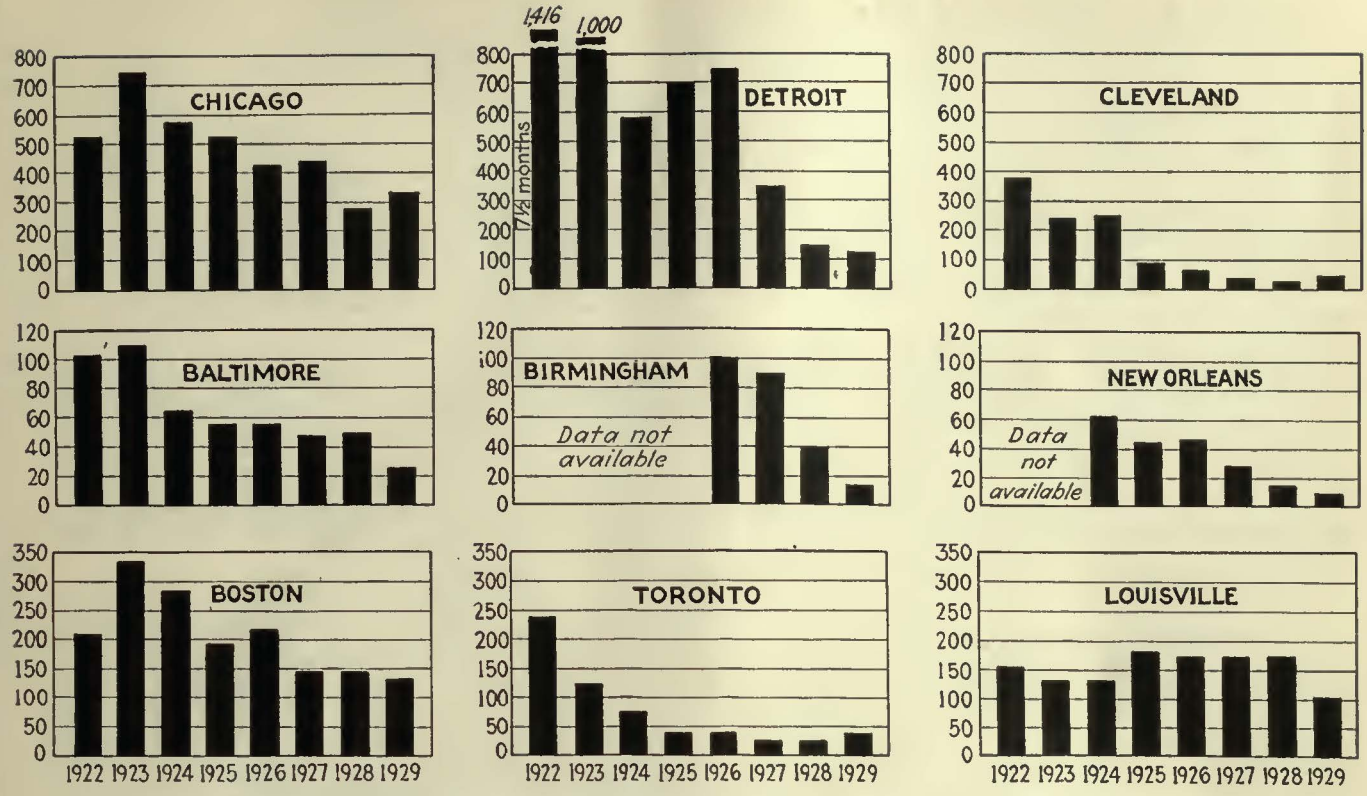
Since 1927 the Chicago Surface Lines has had a crew inspecting sections every 60,000 car passes. This crew also renews ears and other miscellaneous small fittings. If, however, the line crew finds any of the larger elements of the overhead system to be in need of replacement or repair and the crew cannot take care of the job themselves, they report this to the superintendent, who assigns a regular repair crew to make the required repairs. This company renewed an average of 173 miles of trolley wire per year from 1914 to 1927 but in 1928 replacements were reduced to 78 miles and during the first 9 months of 1929 only 74 miles was replaced. The Chicago Surface Lines has found also that the use of underslung ears and armor has been an important factor in the reduction of trolley breaks.

The Cleveland Railway considers it of great benefit to the maintenance of its overhead system to give the line crews a thorough training. Samples of wire in different stages of wear are shown to the men, and they are instructed as to just how far this wear may progress until the defective section has to be replaced in order to prevent a wire break and a consequent delay and tie-up of traffic. Cleveland line crews are provided with gages for inspecting the wire, thus enabling them to determine accurately just when a certain piece of wire has to be replaced. If a wire is reported to be in need of substitution a special line inspector makes a careful examination and submits a report. The decision as to the action to be taken is then left to the superintendent, who from his experience determines whether replacement is necessary or not.

The average length of wire maintained by each line crew of the United Railways & Electric Company of Baltimore is approximately 60 miles. The New Orleans Public Service and several others, however, allot 100 miles to each crew. As a rule, repairs on fittings are made during the day but replacement of wire, except for actual breakdowns, takes place during the night on most properties.

Line crews in Baltimore are available for 24 hours. During the day they are not kept at their stations but inspect continually the overhead system. They are required to call the dispatcher at regular intervals, informing him as to their location so that in case of emergency they can be located at once. Each crew is assigned a certain portion of the system for which it has sole responsibility, and is held accountable for the up-keep and general condition of the overhead structures. In this way the entire system is covered thoroughly not less than once a month.

In Baltimore it also has been found desirable to study the form of trolley wheel, as this has been responsible



Progress in overhead trolley wire maintenance during the last eight years is clearly shown by the general decrease in the number of breaks

for many of the breaks. As a result the U-groove type of wheel has replaced the V-type formerly in use on the property, with a reduction in the number of replacements of ears to about one-fourth of what they were four years ago.

Research in overhead construction characteristics has been carried on extensively by the Cleveland Railway. It has been observed that the ears which are near car stops, beyond the point where the car comes to a standstill, are most subject to burndowns due to the starting arc. These ears usually have to be replaced every inspection period. Ears farther away from the car stop will last three or four inspection periods. Ears located before car stops will only wear out on account of mechanical causes, as the current is almost always cut off as the trolley passes over them prior to coming to a stop and they will only be worn out by the friction of the collector.

Maintenance of Span Wires Important

Several railways included in this survey believe that best results are obtained when the contact wire is kept taut and the span wires comparatively slack. Proper maintenance of the span wires and ears is of great importance and has direct influence on the number of trolley wire breaks. Experience of the United Railways & Electric Company of Baltimore indicates that it is advantageous to have the ends of the ears taper ground to afford the trolley wheel an unobstructed approach and run-off, thereby increasing the wear on the wire itself. Another matter of vital importance is the use of only high quality material in the overhead structure.

Much attention is given also to the proper maintenance and inspection of the collecting devices on car equipment. Loose trolley wheels or shoes not only disturb the passengers by their abnormal noisiness but also cause more rapid wear of the contact wire. Many companies have enlisted the aid and co-operation of building contractors and others who move loose building equipment, shovels, etc., across car lines, and they thus reduce considerably the number of wires burned out or pulled down. One company has gone so far as to ask all contractors in its city to notify it when shovels or other equipment have to be moved across car lines, and a special line crew is assigned to assist them in crossing the track.

It is worthy of note that on all of these properties which have made excellent records in reduction of trolley wire breaks the improvement has not been made with a sacrifice of economy. Instead, the total cost has in nearly every instance been reduced. The line crews, instead of taking all their time in making emergency repairs that can only be considered temporary, now spend more effort in making permanent renewals of trolley wire as a matter of routine. The work is then done with more care and as a result the tendency to failure in service is greatly reduced. More efficient methods of stringing trolley wire have been devised in several of the cities mentioned. These have been noted in this paper from time to time. Reclamation of materials also is practiced to a large extent and considerable savings are made in maintenance expense.

Apart from any direct saving in cost of carrying on the work of the line department, all of the companies have made large savings in transportation expense on account of fewer delays to cars. There has also been a greater gross revenue due to the very small number of tie-ups as compared with the records of past years when the work of the line department was not organized as efficiently as it is at present.

Monthly and Other Financial Reports

	Operating Revenue $	Operating Expenses $	Taxes $	Gross Income $	Net Income $
Key System Transit Co., Oakland, Cal.					
October, 1929	617,783	.....	.....	.....	*30,803*
October, 1928	629,852	.....	.....	.....	*53,530*
10 mo. end. Oct., 1929	5,903,991	.....	.....	.....	*842,904*
10 mo. end. Oct., 1928	6,017,318	.....	.....	.....	*637,341*
Market Street Railway, San Francisco, Cal.					
November, 1929	799,843	656,119	.....	143,724	85,452
November, 1928	.....	.....	.....	.....	.....
12 mo. end. Nov., 1929	9,584,907	8,084,583a	.....	1,500,324	786,014
12 mo. end. Nov., 1928	9,795,829	8,324,868a	.....	1,470,961	.....
Capital Traction Co., Washington, D. C.					
October, 1929	370,108	263,356	29,329	80,097	49,881
October, 1928	377,300	256,792	28,688	95,851	67,058
10 mo. end. Oct., 1929	3,564,165	2,558,662	275,210	751,534	446,781
10 mo. end. Oct., 1928	3,613,504	2,540,932	289,178	808,517	512,988
Jacksonville Traction Co., Jacksonville, Fla.					
October, 1929	96,472	79,495	9,037	7,389	.....
October, 1928	102,749	82,286	8,875	10,996	.....
12 mo. end. Oct., 1929	1,150,146	942,972	107,807	93,124	*64,126*
12 mo. end. Oct., 1928	1,219,114	973,281	108,261	130,781	*84,656*
Honolulu Rapid Transit Co., Honolulu, T. H.					
October, 1929	88,576	52,387	7,932	30,242	15,297
October, 1928	91,310	53,119	13,172	26,502	18,795
10 mo. end. Oct., 1929	878,604	504,821	90,011	294,685	180,445
10 mo. end. Oct., 1928	896,373	525,874	120,999	260,672	182,008
Honolulu Rapid Transit Co., Honolulu, T. H.					
November, 1929	85,384	51,473	7,932	27,044	15,407
November, 1928	86,169	51,366	13,046	22,829	15,124
11 mo. end. Nov., 1929	963,989	556,295	97,943	321,729	195,850
11 mo. end. Nov., 1928	982,543	577,241	134,046	283,500	197,130
Chicago Surface Lines, Chicago, Ill.					
November, 1929	5,246,124	4,056,792a	.....	1,199,332	898,499k
November, 1928	5,208,725	4,052,149a	.....	1,156,576	871,572k
Des Moines City Railway, Des Moines, Iowa					
October, 1929	180,198	124,397	.....	.....	13,053
August, 1929	177,305	134,732	.....	.....	154
United Railways & Electric Co., Baltimore, Md.					
October, 1929	1,460,077	962,111	140,656	371,860	87,260
October, 1928	1,437,781	908,727	156,669	384,384	92,584
10 mo. end. Oct., 1929	13,838,333	9,443,190	1,340,756	3,203,953	381,670
10 mo. end. Oct., 1928	13,482,451	9,035,030	1,309,056	3,260,461	416,253
United Railways & Electric Co., Baltimore, Md.					
November, 1929	1,407,934	919,304	142,421	355,717	72,462
November, 1928	1,360,315	870,431	140,568	361,455	76,260
11 mo. end. Nov., 1929	15,246,268	10,362,494	1,483,178	3,559,670	454,133
11 mo. end. Nov., 1928	14,842,766	9,905,462	1,449,625	3,621,916	492,514
Boston Elevated Railway, Boston, Mass.					
October, 1929	2,929,491	2,048,406	137,268	758,760	64,866
October, 1928	2,980,077	2,153,209	131,745	709,236	3,135
4 mo. end. Oct., 1929	.....	.....	.....	.....	780,512
4 mo. end. Oct., 1928	.....	.....	.....	.....	931,392
Eastern Massachusetts Street Ry., Boston, Mass.					
October, 1929	681,562	465,241	26,732	215,385	67,947
October, 1928	711,035	471,762	31,561	233,526	66,292
10 mo. end. Oct., 1929	7,154,387	4,510,930	318,417	2,517,670	784,164
10 mo. end. Oct., 1928	7,499,552	4,853,317	297,034	2,552,284	808,460
Boston, Worcester & New York Street Ry., Framingham, Mass.					
October, 1929	61,124	51,638	1,625	8,651	7,181
October, 1928	56,904	49,298	1,614	6,217	4,747
10 mo. end. Oct., 1929	618,580	499,955	16,523	113,757	99,057
10 mo. end. Oct., 1928	625,928e	534,133	16,148	77,675	62,826
Middlesex & Boston Street Railway, Newtonville, Mass.					
3 mo. end. Sept., 1929	260,095	230,722	8,702	20,671	*18,363*
3 mo. end. Sept., 1928	263,435	246,129	5,343	11,963	*28,127*
9 mo. end. Sept., 1929	859,897	623,319	25,399	111,179	*5,659*
9 mo. end. Sept., 1928	875,038	747,626	17,538	109,874	*11,552*
Department of Street Railways, Detroit, Mich.					
November, 1929	1,932,988	1,477,477	61,987	403,476	256,822
November, 1928	2,097,518	1,639,648	63,435	423,734	262,888
12 mo. end. Nov., 1929	26,520,209	20,983,064	748,021	4,907,464	3,245,066
12 mo. end. Nov., 1928	24,486,908	19,130,829	784,629	4,827,221	2,910,339
Duluth-Superior Traction Co., Duluth, Minn.					
3 mo. end. Sept., 1929	404,098	345,901	.....	58,197c	*18,519*
3 mo. end. Sept., 1928	429,985	363,194	.....	66,791c	*11,987*
9 mo. end. Sept., 1929	1,349,290	1,129,973	.....	219,317c	*13,609*
9 mo. end. Sept., 1928	1,440,423	1,156,173	.....	284,250c	37,053
Kansas City Public Service Co., Kansas City, Mo. (See E.R, J.-Dec.)					
October, 1929	761,938	578,448	41,675	141,813	66,889
October, 1928	.....	.....	.....	.....	.....
10 mo. end. Oct., 1929	7,434,118	5,627,347	416,750	1,390,020	614,329
10 mo. end. Oct., 1928	.....	.....	.....	.....	.....
Kansas City Public Serzice Co., Kansas City, Mo.					
November, 1929	746,136	615,461a	.....	130,675	55,821
11 mo. end. Nov., 1929	8,180,255	6,659,560a	.....	1,520,695	670,150

	Operating Revenue $	Operating Expenses $	Taxes $	Gross Income $	Net Income $
Lincoln Traction Co., Lincoln, Neb.					
October, 1929	.....	.....	.....	.....	.....
October, 1928	.....	.....	.....	.....	.....
10 mo. end. Oct., 1929	394,582	324,651	.....	49,801	9,819
10 mo. end. Oct., 1928	395,552	300,058	.....	73,425	22,268
Fonda, Johnstown & Gloversville R.R., Gloversville, N. Y.					
October, 1929	92,098	62,446	4,300	30,444	*779*
October, 1928	86,037	60,240	5,775	22,559	*9,037*
10 mo. end. Oct., 1929	846,679	633,507	74,860	248,404	*69,674*
10 mo. end. Oct., 1928	864,356	621,237	76,335	255,646	*62,296*
Jamestown, Westfield & Northwestern R.R., Jamestown, N. Y.					
9 mo. end. Sept., 1929	224,690	195,769	10,125	35,433	9,525
9 mo. end. Sept., 1928	187,296	193,023	10,125	476	*42,431*
Brooklyn-Manhattan Transit Corporation, New York, N. Y.					
November, 1929	4,987,071	3,345,314	273,696	1,443,361	673,707
November, 1928	3,970,021	2,477,877	264,260	1,307,147	605,723
5 mo. end. Nov., 1929	25,210,850	17,021,861	1,596,231	6,943,391	3,052,578
5 mo. end. Nov., 1928	20,000,199	13,142,902	1,382,900	5,886,399	2,432,232
Brooklyn & Queens Transit Corporation, New York, N. Y.					
November, 1929	1,929,432	1,549,294	98,255	304,005	178,518
November, 1928	1,964,189	1,571,694	110,651	305,156	176,636
5 mo. end. Nov., 1929	9,933,027	7,874,414	565,470	1,600,398	975,556
5 mo. end. Nov., 1928	10,076,325	8,373,900	537,715	1,272,400	626,412
Hudson & Manhattan R.R., New York, N. Y.					
November, 1929	1,059,113	510,620a	.....	548,492	215,618
November, 1928	1,044,884	528,924a	.....	515,960	180,933
11 mo. end. Nov., 1929	11,405,284	5,740,672a	.....	5,664,612	1,974,920
11 mo. end. Nov., 1928	11,287,618	5,874,471a	.....	5,413,147	1,722,957
Interborough Rapid Transit Co., New York, N. Y.					
October, 1929	6,387,991	3,995,255	202,126	2,190,638	*150,664*
October, 1928	6,143,922	3,668,587	202,456	2,272,878	473,808
4 mo. end. Oct., 1929	22,961,459	14,995,361	799,700	7,166,397	*607,651*
4 mo. end. Oct., 1928	21,543,264	13,953,164	795,566	6,794,533	*410,701*
Interborough Rapid Transit Co., New York, N. Y.					
November, 1929	6,276,425	3,666,977	201,549	2,407,898	*122,647*
November, 1928	5,925,143	3,578,340	201,588	2,145,124	345,546
5 mo. end. Nov., 1929	29,237,885	18,662,339	1,001,249	9,574,296	*730,199*
5 mo. end. Nov., 1928	27,462,408	17,531,504	997,155	8,939,748	65,155
Long Island Railroad, New York, N. Y.					
October, 1929	3,578,672	2,442,505	250,773	885,394	711,856h
October, 1928	3,664,309	2,452,332	219,239	992,738	821,416h
10 mo. end. Oct., 1929	35,131,457	12,268,686	2,744,112	9,524,574	7,918,561h
10 mo. end. Oct., 1928	34,209,872	10,482,000	2,402,214	8,079,786	6,591,414h
New York Railways, New York, N. Y.					
September, 1929	535,117	453,486a	.....	81,631	20,554d
September, 1928	541,159	457,322a	.....	83,837	19,096d
9 mo. end. Sept., 1929	4,696,094	4,110,354a	.....	585,740	38,242d
9 mo. end. Sept., 1928	4,957,177	4,278,007a	.....	679,170	115,175d
New York Railways, New York, N. Y.					
October, 1929	525,979	459,873a	.....	66,106	5,105f
October, 1928	569,792	490,828a	.....	78,964	27,223f
10 mo. end. Oct., 1929	5,222,073	4,570,227a	.....	651,846	43,347f
10 mo. end. Oct., 1928	5,526,969	4,768,835a	.....	758,134	142,399f
New York, Westchester & Boston Ry., New York, N. Y.					
October, 1929	218,467	136,808	24,047	59,480	*157,910*
October, 1928	215,179	147,383	20,525	48,026	*159,822*
10 mo. end. Oct., 1929	2,111,276	1,285,019	225,903	610,999	*1,544,185*
10 mo. end. Oct., 1928	1,985,809	1,327,487	199,486	469,810	*1,554,435*
New York, Westchester & Boston R.R., New York, N. Y.					
November, 1929	202,381	.....	.....	36,048	*180,500*
November, 1928	199,678	.....	.....	37,766	*169,752*
11 mo. end. Nov., 1929	2,313,658	.....	.....	636,402	*1,724,686*
11 mo. end. Nov., 1928	2,185,488	.....	.....	496,602	*1,689,136*
Staten Island Rapid Transit Co., New York, N. Y.					
October, 1929	229,918	161,196	18,000	50,722	40,227h
October, 1928	272,567	174,758	15,000	82,809	42,364h
10 mo. end. Oct., 1929	2,225,217	1,654,132	176,817	394,268	328,335h
10 mo. end. Oct., 1928	2,625,884	1,777,622	198,708	649,554	277,743h
Third Avenue Railway, New York, N. Y.					
October, 1929	1,320,170	1,007,189	92,385	241,078	*16,704*
October, 1928	1,365,099	1,031,860	96,329	245,046	8,838
4 mo. end. Oct., 1929	5,136,505	3,956,777	362,166	898,806	*139,775*
4 mo. end. Oct., 1928	5,196,596	4,002,640	380,357	884,359	*114,946*
New York State Railways, Rochester, N. Y.					
September, 1929	667,684	661,191a	.....	15,131	*111,645*
September, 1928	.....	.....	.....	.....	.....
12 mo. end. Sept., 1929	9,253,828	8,075,266a	.....	1,280,014	*237,303*
12 mo. end. Sept., 1928	.....	.....	.....	.....	.....
Troy City Railway, Troy, N. Y.					
12 mo. end. Sept., 1929	743,241	666,609	39,336	42,589	*57,411*
12 mo. end. Sept., 1928	770,852	545,588	38,140	83,824	*16,176*
New York State Railways, Utica Lines, Utica, N. Y.					
12 mo. end. Sept., 1929	1,433,952	1,009,386	111,226	39,621	*88,864*
12 mo. end. Sept., 1928	1,514,107	1,022,922	99,895	100,939	*27,959*

	Operating Revenue $	Operating Expenses $	Taxes $	Gross Income $	Net Income $
Cincinnati Street Railway, Cincinnati, Ohio					
November, 1929.....	721,404	490,905	46,378	186,190	10,233
Community Traction Co., Toledo, Ohio					
October, 1929.....	306,768	244,503	.....	.....	2,383
October, 1928.....	324,341	236,885	.....	.....	.....
Lebanon Valley Street Railway, Lebanon, Pa.					
12 mo. end. Sept., 1929.	145,641	118,656a	.....	17,921	*7,079*
12 mo. end. Sept., 1928	150,175	109,528a	.....	31,134	6,134
Philadelphia & Western Ry., Norristown, Pa.					
October, 1929.....	71,112	37,112	.....	34,000e	19,840
October, 1928.....	77,555	37,734	.....	39,821e	24,664
Philadelphia & Western Ry., Norristown, Pa.					
November, 1929.....	67,305	49,552	.....	.....	17,753
November, 1928.....	68,796	49,176	.....	.....	19,620
11 mo. end. Nov., 1929	724,657	583,265	.....	.....	141,392
11 mo. end. Nov., 1928	762,606	609,786	.....	.....	152,820
Galveston-Houston Electric Railway, Houston, Texas					
October, 1929.....	46,399	26,557	2,716	17,125	.....
October, 1928.....	51,638	29,057	2,932	19,647	.....
12 mo. end. Oct., 1929	598,952	334,522	31,421	233,180	*57,078*
12 mo. end. Oct., 1928	656,615	383,429	31,483	241,701	*27,499*
Houston Electric Co., Houston, Texas					
October, 1929.....	289,119	176,475	27,114	85,529	.....
October, 1928.....	293,502	171,453	23,771	98,277	.....
12 mo. end. Oct., 1929	3,384,334	2,096,068	295,212	999,153	598,303
12 mo. end. Oct., 1928	3,319,296	2,028,260	294,231	996,804	588,675
Pacific Northwest Traction Co., Seattle, Wash.					
October, 1929.....	82,289	58,755	6,942	16,591	.....
October, 1928.....	70,403	67,383	5,179	*2,160*	.....
12 mo. end. Oct., 1929	937,596	733,532	56,471	147,590	30,825
12 mo. end. Oct., 1928	884,757	732,811	51,900	100,044	*66,408*
Seattle Municipal Railway, Seattle, Wash.					
October, 1929.....	477,244	401,911	.....	76,271	26,368
October, 1928.....	483,615	405,651	.....	79,678	27,014
10 mo. end. Oct., 1929	.....	.....	.....	.....	168,816
10 mo. end. Oct., 1928	.....	.....	.....	.....	*426,201g*
Calgary Municipal Railway, Calgary, Alta.					
10 mo. end. Oct., 1929	852,661	512,510	.....	340,151b	37,464
10 mo. end. Oct., 1928	.....	.....	.....	.....	44,673
Edmonton Radial Railway, Edmonton, Alta.					
9 mo. end. Sept., 1929.	621,100	402,068	.....	219,032	7,400
9 mo. end. Sept., 1928.	.....	.....	.....	.....	*3,881*
Edmonton Radial Railway, Edmonton, Alta.					
October, 1929.....	69,803	47,253	.....	22,549	201
October, 1928.....	67,875	43,867	.....	24,008	1,264
10 mo. end. Oct., 1929	690,904	449,321	.....	241,582	7,601
10 mo. end. Oct., 1928	656,624	438,808	.....	217,815	*2,616*
Lethbridge Municipal Railway, Lethbridge, Alta.					
9 mo. end. Sept., 1929.	45,315	36,587	.....	8,728	*14,541*
9 mo. end. Sept., 1928.	44,712	41,225	.....	3,487	*19,777*
British Columbia Electric Railway, Vancouver, B. C.					
September, 1929.....	1,169,278	784,097	.....	385,181b	.....
September, 1928.....	1,101,483	746,296	.....	355,187b	.....
3 mo. end. Sept., 1929.	3,494,751	.....	.....	1,135,632b	.....
3 mo. end. Sept., 1928.	3,284,759	.....	.....	1,031,641b	.....
British Columbia Electric Railway, Vancouver, B. C.					
October, 1929.....	1,230,278	698,747	.....	531,531b	.....
October, 1928.....	1,145,394	631,879	.....	513,515b	.....
4 mo. end. Oct., 1929..	4,725,029	2,617,947	.....	2,107,082b	.....
4 mo. end. Oct., 1928..	4,430,053	2,453,297	.....	1,976,856b	.....
Guelph Radial Railway, Guelph, Ont.					
11 mo. end. Sept., 1929	80,935	74,739	1,877	4,319	*29,227*
11 mo. end. Sept., 1928	.....	.....	.....	.....	*23,768*
Ontario Hydro-Electric Railways, Essex District					
11 mo. end. Sept., 1929	1,142,904	859,237	4,346	279,320	*47,568*
11 mo. end. Sept., 1928	.....	.....	.....	.....	4,592
Regina Municipal Railway, Regina, Sask.					
10 mo. end. Oct., 1929	343,579	212,973	.....	130,605	12,671
10 mo. end. Oct., 1928	.....	.....	.....	.....	*2,808*
Saskatoon Municipal Railway, Saskatoon, Sask.					
10 mo. end. Oct., 1929	318,437	208,585	12,349	97,502	10,548
10 mo. end. Oct., 1928	.....	.....	.....	.....	3,587

Italic figures indicate deficit. *a* Includes taxes, *b* Net operating revenue. Before taxes. *d* Before adjustment bond interest. *e* Includes $41,793 special freight revenue. *f* Before adjustment bond interest. *g* Deficit after deducting $574,676 tax judgment. *j* Net after rents. *j* Before reserves. *k* After joint account expenses, federal taxes, and city's 55 per cent. *l* Including Brooklyn & Queens Transit System.

More Than 3,000,000,000 a Year Carried in New York

RIDERS on the various transit lines in the city of New York totaled more than 3,317,400,000 passengers in the 1929 fiscal year, according to the annual report of the New York Transit Commission. During the year ended June 30, 1929, the rapid transit and street surface lines in the city carried a total of 2,972,400,000 passengers, an increase of 33,500,000 or 1.1 per cent over the preceding fiscal year. In addition the Hudson & Manhattan Railroad carried 111,800,000 passengers, and bus companies (exclusive of the Tompkins Bus Corporation and the municipal bus lines) 111,200,000 passengers, an increase of 58,000,000 or 1.9 per cent over the preceding year. The traffic of the Tompkins Bus Corporation is not included in the above comparison as no figures are available for the fiscal year 1928. This company carried 14,500,000 passengers in 1929. Traffic on the municipal bus lines, which do not report to the commission, has been estimated at 107,500. The total traffic, therefore, during the year ended June 30, 1929, on the rapid transit lines, Hudson tubes, street surface cars and bus lines, was more than 3,317,400,000 passengers.

The distribution of this traffic by classes of service was as follows:

Division of Passenger Traffic, New York Transportation Lines

	Per Cent of Total Traffic
Interborough Rapid Transit Co.	
Subway division	28.11
Elevated division	10.51
Total, I. R. T.	38.62
New York Rapid Transit Corporation	20.82
Total, rapid transit lines	59.44
Street surface lines	30.16
Hudson & Manhattan Railroad	3.37
Bus lines reporting to the commission	3.79
Municipal bus lines (estimated)	3.24
Total	100.00

Rapid transit traffic alone amounted to 1,971,800,000 passengers, or 53,300,000 (2.8 per cent) more than in 1928. The following tabulation shows the distribution by boroughs of the ticket sales or fare collections at all of the rapid transit stations, both Interborough Rapid Transit Company and New York Rapid Transit Corporation (Brooklyn-Manhattan Transit System), during the fiscal years ended June 30, 1929 and 1928:

	Fiscal Year		Increase	
Stations in	1929	1928	Number	Per Cent
Manhattan.....	1,149,260,509	1,135,237,354	14,023,155	1.24
Bronx.....	215,349,575	204,925,096	10,424,479	5.09
Brooklyn.....	486,137,756	466,798,253	19,339,503	4.14
Queens.....	119,650,532	110,167,414	9,483,118	8.61
Unallocated.....	1,446,787	1,376,628	70,159	5.10
Total.....	1,971,845,159	1,918,504,745	53,340,414	2.78

Fare collections at the Times Square subway stations during the two fiscal years were as follows:

	1929	1928	Increase
Interborough lines.....	55,944,891	55,093,646	851,245
N. Y. R. T. lines.....	35,936,443	34,630,250	1,306,193
Total, Times Square.....	91,881,334	89,723,896	2,157,438

NEWS *of the Industry*

LATE NEWS

Kansas City, Mo.—The directors of the Kansas City Public Service Company on Dec. 26 approved the tentative plan of the company to purchase and operate the Yellow and the Checker cabs. The purchase contract still is in process of negotiation. Under the contract the railway would pay $187,000 cash for the property and assume a bonded debt of $375,000. The railway hopes to effect economies by combining the operating departments of the two companies.

✦

Los Angeles, Cal.—On Dec. 14, $118,041 was distributed in bonus checks and special awards to trainmen of the Los Angeles Railway. Of that amount $17,830 covered special awards which, in addition to the earned bonus, were divided among 912 men of the 2,046 who participated in the distribution. Many more men participated in the award this year than did so a year ago.

✦

New Orleans, La.—Judge Wayne G. Borah in the United States District Court has issued a temporary order restraining 815 alleged jitney operators from using their automobiles to carry passengers in competition with the street cars of the New Orleans Public Service, Inc., on which the union crews struck last July.

✦

St. Louis, Mo.—The St. Louis Public Service Company's new experimental fare of a twelve-ride weekly ticket for $1, single adult rides for 10 cents and children's at 5 cents instead of 3 cents, went into effect on Dec. 30. Six children's tickets may be purchased for 25 cents while ticket holders riding more than twelve times in any one week may secure the extra rides at 5 cents each. Hereafter ticket riders must present their tickets to be punched by the conductor when paying the fare, but there will be no limits on the number of times a ticket may be used in any week.

✦

New York, N. Y.—Standardized taxicabs for New York City have been agreed on by manufacturers, owners and Police Commissioner Whalen. All cabs now on the streets or in process of manufacture will be permitted to be sold and operated in the city, but all taxicabs manufactured after Feb. 1 for use in New York City must comply with new regulations. Cabs are to be of two classes, heavy cabs seating five or more passengers and light cabs seating two or three. They are to have larger rear windows.

✦

Boston, Mass.—The new high-speed trolley line between Mattapan and Ashmont was opened to the public on Dec. 21 by the Boston Elevated Railway. The new line cuts the running time from Mattapan to the center of Boston by nine minutes.

Late News Continued on Page 54

Eight-Cent Cash Fare Announced in Cleveland

New Rate in the Ohio City Went Into Effect on Jan. 1. Tickets Sell at Rate of Seven for 50 Cents

THE Cleveland Railway, Cleveland, Ohio, on Dec. 26, announced an increase in the rate of fare from 7 to 8 cents, effective on Jan. 1. The increase had been predicted, following a decision against the company by the United States District Court of Appeals in an income tax case.

Under the new rate of fare, tickets will be sold in strips of seven for 50 cents. In East Cleveland and Cleveland Heights, the two suburbs which pay a service-at-cost fare based on the Cleveland rate, the cash fare will advance from 9 to 10 cents, but the ticket rate will continue to be six for 50 cents.

The result of the company's announcement was an immediate revival of agitation for adoption of a zone system of fares urged by the company a year ago but tabled by the street railway committee of the City Council. President Alexander said:

"For many months the interest fund has been at a figure which would have made an increase necessary had we not been hopeful of a favorable decision in our long-pending income tax suit. The decision of the United States Court of Appeals, while a partial victory, makes impossible the continuance of the present rate until we can have appealed the case and have had a final adjudication.

"It is regrettable that the city did not agree with us at the beginning of the year on some application of the zone system which would make fares more equitable to riders. As it is, the increase falls largely on the city rider, whose ticket rate, as well as cash rate, is advanced.

"The East Cleveland and Cleveland Heights riders, generally, will pay no increase, only the cash rate and local fare being changed.

"Lakewood, of course, advances with Cleveland, although retaining its local rate. Perhaps with the differential between city and suburbs reduced to approximately 1 cent, except in cash rates, the making of a new franchise by Lakewood will be possible."

San Francisco Convention Plans Maturing

THE 49th annual convention of the American Electric Railway Association will be held at San Francisco, Cal., June 23 to 26, inclusive, 1930.

The national character of the convention brings together several thousand delegates. A sizable delegation from the various European and South American memberships of the association is also expected.

Committees are now at work under the direction of the general chairman, W. V. Hill, manager of the California Electric Railway Association, 58 Sutter Street, San Francisco, Cal. Edwin C. Faber, vice-president of Barron G. Collier, Inc., New York City, will have charge of the three special trains.

Cincinnati-Lake Erie Line Opened

The Cincinnati & Lake Erie Railroad, formed recently through the consolidation of the Cincinnati, Hamilton & Dayton Railway, the Indiana, Columbus & Eastern Traction Company and the Lima-Toledo Railroad, opened its electric line, linking the Ohio River with Lake Erie, on Dec. 31. The new system, announced by Dr. Thomas Conteni is the longest, straight main electric interurban line in the world. It covers a route of 220 miles.

The new line will offer high-speed passenger and freight service with improved equipment. New types of motors have been developed for cars in this service which, under tests, have attained a speed of 75 m.p.h.

Consolidation of the three interurban lines was engineered by the Cincinnati, Hamilton & Dayton Railway under the direction of Dr. Thomas Conway, president of that line.

Officers of the new Cincinnati & Lake Erie Railroad, besides President Conway, are William L. Butler, Philadelphia, executive vice-president; J. H. McClure, Dayton, vice-president in charge of public relations; Richard Breckinridge, Cincinnati, vice-president in charge of traffic; H. C. Donecker, Dayton, vice-president in charge of research, and W. D. Gordon, Philadelphia, secretary and treasurer.

Cars, Buses, Taxis and Planes in Grand Rapids

A municipal transportation system which ties up street cars, buses, taxicabs and airplanes, has been effected in Grand Rapids, Mich., by the Grand Rapids Railroad. The move is looked upon by Louis J. DeLamarter, general manager, as one of the outstanding steps in city transportation service. He points out that the combined services of street car, bus and taxicab automatically will help each other to serve further the residents of the city, permitting the city's prin-

cipal transportation organization to meet every citizen's needs.

While the railroad has not taken over an air service, the Furniture Capital Air Service, Inc., has taken offices in the street railroad building and a fleet of planes is to be available at all times for aerial transportation service from Grand Rapids to any other city in the state with a landing field.

Special attention will be paid to emergency and commercial calls, which may be filed with the railway central office. The system has been worked out so completely that a person wishing plane service may call for a cab to the airport and his taxi driver will have his ticket for the flight when he arrives.

The entire system will be under municipal regulation.

The railroad plans a special school of instruction for the cab drivers. A similar school long has been in operation for trainmen.

The company also has announced it will spend approximately $100,000 in 1930 on improvements. Twenty new electric coaches will be placed in service as soon as possible, Mr. De Lamarter asserts.

Richmond Hard Hit by Storm

The recent cold wave, which froze up private automobiles and even made the average home in and around Richmond, Va., uncomfortable at times, was not in the least partial to the Virginia Electric & Power Company. The movement of cars and buses, which is ordinarily according to carefully worked out schedules, became exceedingly irregular. Frozen air lines, slippery tracks and pavements, disabled automobiles and trucks, and other causes contributed to the confusion. On Dec. 28 there were 21 fire alarms. General Manager Penick said:

"The other day we had a trolley break, the second in a year, and service was crippled temporarily over a considerable area, but the ice and sleet were the main contributors to irregular service.

"We are not citing the difficulties with which we have to contend as alibis for failures of our service, but we want our patrons to know the facts and when they know, we feel sure they will bear with us under such conditions."

Edward Dana on the Air

Edward Dana, general manager of the Boston Elevated Railway, Boston, Mass., gave the first of a series of radio broadcasts on Dec. 10 from Station WEEI. The broadcast is identified as the "El Service Hour" intended to give the public a better insight into and understanding of the problems and difficulties confronting present-day transportation companies. Mr. Dana said in part:

"We hope to make clear matters which cause misunderstandings, and demonstrate that our only aim is successful operation and satisfactory service. At present the equipment of the Boston Elevated Railway is modern in every respect. It compares favorably with the best in use anywhere in the country. By reason of this modernized equipment your trips on the Elevated system have been made more comfortable, speedier and safer."

Mr. Dana explained that the elevated carried 1,000,000 passengers daily. He said the company would do its utmost to render efficient service in all respects and under all circumstances.

City and Company Co-operate on Buffalo Improvements

The International Railway, Buffalo, N. Y., has been requested by the Buffalo City Council to undertake track reconstruction and roadbed improvements on 40 streets covering 32 miles of single track and involving an expenditure of approximately $1,920,000 for 1930. The tentative program was suggested by the municipal authorities at a conference attended by B. J. Yungbluth, president of the railway. President Yungbluth expressed the belief that this program was too much for the company to undertake in a single year, but consented to cooperate with the City Council in reaching an agreement on streets where the work is most essential.

Denver Fare Ordinance Advanced

With only one change, boosting from $10,000 to $15,000 annually the amount to be paid for use of city streets, the Denver Tramway Corporation ordinance, asking higher fares and permission to substitute bus routes for unprofitable rail lines, was passed on first reading by the City Council of Denver, Col., on Dec. 23.

A second passage Jan. 5 will make the bill operative, carrying provisions for 10-cent fares, or three tokens for 25 cents, and a cross-town bus route, in addition to several bus routes providing service for districts in which it seems desirable to supplant cars.

Two formal protests, representing 1,200 residents of East Denver and Montclair, were registered prior to passage of the ordinance. The protestants do not believe buses will provide adequate transportation facilities in their territory where electric trams are to be eliminated. On other phases of the bill there were no objections.

New Jacksonville Franchise Up Jan. 14

The Miller draft of the proposed franchise of the Jacksonville Traction Company, Jacksonville, Fla., to take the place of the one under which it now operates but which expires in 1932, will go to the company officially at once. The grant was placed on first reading at a special session of the City Council on Dec. 19, and referred to the laws and rules and public service committees jointly, with instructions to the recorder that copies be sent the company, along with a copy of the report and recommendations of the public service committee that this action be taken.

Under the recommendations of the public service committee the company will be asked to make a written reply to the communication, giving its views on the proposed franchise, as drafted by City Attorney Austin Miller, not later than Jan. 14, the next meeting date of the Council.

Louisville Situation Reviewed

President Barnes Goes Over the Accomplishments During His Regime in Southern City—System Returned to Dividend-Paying Basis

PRESIDENT J. P. Barnes, of the Louisville Railway, Louisville, Ky., issued a statement to the stockholders on Dec. 7 regarding the condition of the company. When Mr. Barnes became president of the company it was laboring under the handicap of a 5-cent fare, under an eighteenth-century type of franchise ordinance. Eventually a 7-cent cash fare was secured; then under federal injunction fares were advanced to 10 cents cash with three tickets for 25 cents.

	Service Given	Earings	Expense
1920.....	11,307,652 (Car-miles)	$4,146,507.28	$3,229,187.38
1928.....	13,136,871 (Car and bus-miles)	4,847,000.40	3,494,755.52
Increase....	1,829,219	$700,493.12	$265,568.14
Per cent....	16.18	16.89	8.22

The number of passengers carried has fallen off, due in part to higher fares, but also in part to the fact that there is considerable unemployment in Louisville at this time. Moreover taxicabs are operating at the rate of 2 miles for 25 cents, and are carrying four passengers for a single fare.

The increase in revenue under the new fare rates became effective too late to affect materially 1929 operations. The belief was expressed, however, that when normal conditions of employment and business in Louisville are restored, the company's earnings will show a material improvement over former years and permit the payment of greater dividends.

The statement set forth in detail the amount of dividends that have been paid under the present management.

The growth of the company is shown in the accompanying table:

President Barnes said in part:

"Not until the recent decision in our fare litigation did we achieve adjustment of the various matters criticised by the bankers who said, several years ago, that under the ordinance regulations in effect at that time neither legal right nor our ability to earn was sufficiently established to assure economical refinancing.

"When the present management took charge in 1920 no dividends, preferred or common, had been paid for two years, and the company's total liabilities exceeded its total assets by more than $400,000. By 1923 our operations and earnings had so improved that we were able to begin paying off accrued dividends on the preferred stock and, since that time, we have paid not only these dividends, but all current preferred dividends and $582,652 common dividends, as well. The total dividend payments have amounted to $2,332,652. At the

close of 1928 there had been accumulated a corporate surplus of $868,328. The report of Humphrey Robinson & Company, accountants, made as of Dec. 31. 1928, shows the common stock of the company to have a book value of $110 a share.

Refinancing Ahead

Our constant effort has been to build up a regular, dependable net earning capacity sufficient to meet the bankers' requirements for refunding operations.

"Since 1923 there have been added to the company's property 121 new cars, 43 buses and numerous smaller items of equipment. Many renewals and improvements of carhouses and track have been made.

"In view of this growth in earnings, addition to capital and improvement of property, there can be little doubt that the present low market quotations of Louisville Railway securities are due to uncertainty in the minds of investors as to the refunding of the $6,000,000 first mortgage bonds due July 1, 1930. We are continuing active negotiations for this refunding. Several plans are under consideration and, therefore, it is impossible to state at this time just what the final proposal will be. It may be that no refinancing plan will be perfected until after the decision of the city's fare appeal, which will be argued in the circuit court at Cincinnati on Jan. 6, 1930. As soon as positive recommendations can be made, I shall advise you fully."

LATE NEWS

Continued from Page 52

Pensacola, Fla.—Gulf Power Company forces are completing construction of the new tracks in the western section of the city for the Bayshore line. Under an agreement with the Frisco Railway when that road purchased parts of the Bayshore line, the power company will operate its Bayshore cars into the city over the spur line. The Frisco Railway is improving the portion of the Bayshore line purchased.

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Seattle, Wash. — Residents of the White River Valley, through which the abandoned Seattle-Tacoma interurban line is routed, have organized to formulate a plan whereby re-establishment of the electric system might be effected. A second meeting has been scheduled for Jan. 15 in the Auburn City Hall. Stage schedules were declared inadequate to serve transportation needs of valley residents. T. J. Ferguson, Auburn, is active in the movement.

✦

Chicago, Ill.—Failure of the City Council of Chicago to initiate action in the matter of the new subway and disputes among officials of the elevated and the surface lines as to whether the proposed State Street subway shall be for elevated trains or for both "L" and surface cars are cited as the two major causes of delay. The fact that the $57,000,000 railway fund, accumulated out of payments made by the surface companies to the city, is now represented in the main by paper, chiefly tax anticipation warrants, is another obstacle in the way of an underground for the Windy City. One definite step toward settling some of these problems was taken recently by a Council sub-committee which will seek to have the telephone company and the Commonwealth Edison company contract with the city to place their underground wires and mains in gallery space in the subway.

✦

Far Rockaway, N. Y.—The Transit Commission and the New York City Board of Transportation are holding a series of conferences for the purpose of working out a co-ordinated policy with respect to the Rockaway Branch of the Long Island Railroad. This is the branch which the company is desirous of selling to the city. The city cannot immediately answer the negotiation count. It will probably be five years before it will have in operation a trunk to Manhattan available to carry the Rockaway traffic, and during that time, unless some makeshift plan is adopted, there might be no relief from the grade-crossing menaces. Further, the estimates of the Board of Transportation engineers as to the cost of a new subway have not been fully developed, so that even if a price were fixed as between the railroad and the city the comparison of that price with present estimates of a new structure would be inconclusive.

✦

Fond du Lac, Wis. — Offering was made on Dec. 16 of a new issue of $2,500,000 Wisconsin Power & Light Company first lien and refunding mortgage 5 per cent bonds, due Dec. 1, 1958, at 96½ and interest. The corporation supplies electric light and power to 268 communities located in 30 counties of central and southern Wisconsin, and wholesales power to 65 communities having an aggregate population exceeding 700,000. In addition it gives 98 communities gas, water, electric railway, bus and heating services.

✦

Philadelphia, Pa.—The new escalator on the northwest plaza of City Hall on the Philadelphia Rapid Transit subway has been placed in operation. The escalator saves 43 of the 64 steps from the station platform to the surface. Passenger approach is by a short stairway from the platform to the mezzanine. Three passengers may ride abreast on the escalator, which will carry from 8,000 to 10,000 passengers per hour. It was built at a cost of $80,000.

✦

Aurora, Ill.—The Illinois Commerce Commission on Dec. 18 approved the issuance of $3,400,000 of 6 per cent ten-year gold notes of the Chicago, Aurora & Elgin Railroad to reimburse the company treasury for capital expenditures for recent extensive improvements made by the railroad.

✦

Tulsa, Okla.—The twelfth annual convention of the Oklahoma Utilities Association will be held at the Mayo Hotel here on March 11, 12 and 13, according to a decision reached by the executive board of the association. Active arrangements for the convention will soon be under way.

Waverly, N. Y.—Permission has been granted the Waverly, Sayre & Athens Traction Company by the New York Public Service Commission to operate buses in place of street cars from the New York-Pennsylvania state line at Cayuta Avenue in Waverly, N. Y., over certain streets in the village. Evidence showed that the company had paid no dividends in 36 years and that it is two years behind on its bond interest.

✦

Oakland, Cal.—Reconstruction of the street car tracks and paving on San Pablo Avenue, from the city limits of South Berkeley, Cal., to the north line of Ashby Avenue, is now being undertaken by the Key System Transit Company, according to the announcement of Alfred J. Lundberg, president.

✦

Richmond, Va.—Continued operation of the Richmond-Ashland Railway is possible only if citizens served by the road rally to its support. A committee of stockholders has been named to lay the matter before the people in territory adjacent to the 18-mile electric line. Due to loss of revenue and large expenses incurred in making emergency repairs to the viaduct leading into the station on West Broad Street, the company did not expect to be able to meet in full the interest payment on the mortgage bonds due on Jan. 1.

✦

Pasadena, Cal.—Elimination of every grade crossing in Pasadena, eventual electrification of the railroad, elevation of tracks, and installation of double tracks from Los Angeles to San Bernardino are plans which the Santa Fe Railroad is said to be about ready to make public.

✦

Ithaca, N. Y. — The Public Service Commission has decided to defer action on the application of the Ithaca Railway, Inc., for approval of the exercise of rights and construction under a franchise granted to it by the city of Ithaca on Aug. 7, 1929. This action will give the petitioner an opportunity of applying to the commission for approval of a reorganization following the sale of the property and franchises of the former Ithaca Traction Company in 1928. The sale was made, pursuant to an order of the Supreme Court, to Sherman Peer, as agent of a corporation to be formed, who operated the railway until it was turned over to the Ithaca Railway, Inc. The commission held that the reorganization should first be authorized by the commission before the company is in a position to receive the approval which it seeks in the present application.

✦

South Bend, Ind. — Sale of the Chicago, South Bend & Northern Indiana Railway and the Southern Michigan Railway under foreclosure was postponed on Dec. 28 until Feb. 1. Bankruptcy proceedings were entered to satisfy claims of several mortgage holders.

✦

Athens, Ga.—After Jan. 1 people who hail autoists for a lift inside the city limits of Athens will be liable to prosecution by the city. Under the new law no one will be allowed to ask for auto rides while standing in the streets or on the sidewalks. Any speech, motion or gesture to an autoist for a ride will be considered a violation of the law.

(Continued on Page 57)

Bridge Line Rolling Stock to Be Sold

Commissioner Albert Goldman of the Department of Plant and Structures of New York City, through whom, as the custodian of bridges, the deal with respect to the 3-Cent Line was transacted, states that very soon he proposes to dispose of the seventeen cars under the hammer. He will advertise them for a period and then knock them down to the highest bidder. The cars constituted the rolling stock of the defunct Manhattan Bridge 3-Cent Line, which went out of business on Nov. 13, when the city handed its owners a check for $206,750.29 in return for which the company abandoned its operation over the Manhattan Bridge and Flatbush Avenue extension between Fulton Street, Brooklyn, and the Bowery, in Manhattan, returned its franchise to the city and deeded the municipality its tracks, poles, trolley wires and cars—all it owned save some real estate on which is located its carhouse in Brooklyn.

$25,000,000 Expenditure Ahead for St. Louis

Stanley Clarke, president of the St. Louis Public Service Company, St. Louis, Mo., has informed the St. Louis Transportation Survey Commission that the company would spend $25,000,000 or more for additional equipment and other betterments to service, including extensions, if it could raise the money. To the end that this may be accomplished the commission has created a finance committee to work out a plan to enable the company to make the expenditures suggested by R. K. Kelker, Jr., consulting engineer for the commission.

In a recent report to the commission Mr. Kelker suggested the company spend $23,776,000 as follows: Rerouting car lines, $726,000; extensions, $1,338,000; feeder buses, $512,000; 800 new cars, $13,800,000; additions to substations, $1,400,000, and street paving between car tracks, $6,000,000.

He also recommended elimination of hundreds of stops and the ultimate driving of service cars or "jitneys."

Mr. Clarke is a non-voting member of the Transportation Survey Commission.

B. E. Sunny Sees Chicago Settlement Ahead

B. E. Sunny, chairman of the protective committee of the Chicago City & Connecting Railway collateral trust bonds, in a letter to the depositors of bonds says:

"In the letter of June 11, 1929, your protective committee reported that the necessary enabling legislation had been approved by the Governor. The subcommittee of the local transportation committee of the city of Chicago, in charge of working out a new ordinance, has completed a tentative draft of the proposed new franchise.

"The sub-committee left blank three or four sections dealing with the questions of rate of return on the capital account of the new company, amortization and sinking fund. The draft of these sections was deferred till the views of the reorganization committee could be obtained.

"As soon as the views of this committee on the questions of rate of return, amortization, sinking funds and other like problems can be obtained, it is hoped that the drafting of the new franchise will be completed promptly and sent to the City Council for consideration and approval, subject, of course, to a referendum. It is hoped that the ordinance can be passed and ample time given for a thorough discussion of the provisions of the ordinance so that a referendum may be had in the spring or early summer of next year"

Seattle Council Has Two-Year Moratorium Proposal

The City Council of Seattle, Wash., is now ready to take the last step necessary to make the two-year moratorium on the municipal railway bond redemption effective. Two ordinances have been introduced at a special Council session, and can be brought up immediately for passage. The plan is to limit payments to the bondholders to interest during 1930 and 1931 so as to enable the city, during the next few weeks, to repay fully the loan from the Water Department that was necessary to make the payments for 1929 on the purchase bonds. The Water Department loan should be wiped out before March. Heretofore the city has paid to the owners of the property now comprising the municipal lines not only interest but a part of the principal sum.

With the floating debt of the municipal railway wiped out, funds for the purchase of new cars and a modest rehabilitation of the lines will begin to accumulate. There has been no decision as to whether track improvements or new cars shall take precedence, though there is general agreement that the track work should take precedence.

Mayor Frank Edwards has declared that this is the first dividend it has been possible to give the car riders whose money is paying for the railway system, and he has demanded the best rolling stock available. At the same time the Mayor has repeatedly urged that in providing new cars as much work as possible be done in Seattle. He said:

"In this whole proceeding the car riders are entitled to first consideration, because it is their patronage which makes the purchase of the railway system possible and their money that keeps it going."

Inquiry Into Ownership of New York Properties

The Public Service Commission of New York by order issued on Dec. 27 directed the United Traction Company, the New York State Railways and the Schenectady Railway to produce before it in Albany, on Jan. 8, records in an inquiry instituted by the commission, on its own motion, to determine:

The ownership of the capital stock of the companies:

Whether any transfer or assignment of capital stock has been made in violation of the provisions of the public service commission law.

Whether any of the companies has made or recorded upon its books any transfer or assignment of capital stock in violation of the provisions of the public service commission law.

The order directs each of the three companies to produce at the hearing "its stock book and any and all other records showing or tending to show the present ownership of its capital stock and any and all transfers or assignments thereof" by the United Traction Company since June 17, 1927, by the New York State Railways since Jan. 1, 1928, and by the Schenectady Railway since Jan. 1, 1929.

Speeding Up the Louisville Service

The recent experiment by the Louisville Railway, Louisville, Ky., of allowing motormen on Market Street to disregard running time on outbound trips in certain territory has proved successful and is pleasing passengers by enabling them to reach their destination in a shorter period of time. In consequence the company has announced that, beginning at once on specified lines and at locations indicated, motormen may disregard running time and go on to the end of the line as soon as they can do so safely. Leaving time at the ends of the line and at all places other than those designated must be strictly observed.

In the territory in which passengers are picked up in quantity and at transfer points, the company enjoins upon its employees careful attention to the even spacing of the cars and strict observance of the running time.

In the territory where motormen are allowed to disregard the time schedule, cars must be operated with the proper slowdowns for dangerous street crossings. The exceptions that have been made to the regular running rules are solely to prevent the cars from having to drag in order to observe the schedule religiously.

Chicago Transfer Demand Deferred

The Chicago City Council's committee on local transportation has decided not to initiate before the Illinois Commerce Commission proceedings to obtain transfers between the surface and elevated lines. The resolution to this effect presented by Alderman John A. Massen eighteen months ago was sent instead to the subcommittee, which has been drafting the proposed new franchise.

Committee members who opposed starting proceedings before the state commission declared that to do so might interfere with the negotiations with the companies for a new ordinance. All agreed that better service is imperative, and favored incorporating the universal transfers in the new ordinance.

At the same session, a subcommittee of five councilmen was appointed to go before the commission with a request that the Surface Lines be permitted to use part of its $18,000,000 renewals and depreciation fund to build 125 miles of double-track extensions and to install feeder bus service.

The companies point out that the draft is as binding as possible on this point, and that the entire question of whether or not the companies will carry out the promised program depends on their ability to get the $200,000,000 of new monies required.

Other objections of the Aldermen to the proposed ordinance draft had to do with its failure to determine which faction shall pay for building the connection between the elevated system and the subway. The companies wish the city to do this, but the subcommittee desires that the companies reconsider the matter.

The Aldermen rejected the company's alternative section that the city pay for paving the surface line's right-of-way. They consider the section ambiguous which deals with removal of tracks and structures no longer necessary (which may or may not include the elevated loop). They also wish to include a provision that the new company pay the city 3 per cent of its gross receipts.

In general, the attitude of the Aldermen is one of uncertainty. They believe that the city is accorded less power in the proposed ordinance than it enjoys at present over the surface lines.

The Aldermen favor a subway to be built by the city through the central business district.

Public Service Fare Decision Based on Valuation

Newark Paper Analyzes Operation of New Jersey Company So Its Readers May Be Adequately Informed

WHEN the Public Utilities Commission of New Jersey handed down the fare decision in the Public Service Co-ordinated Transport application, the finding for the company granting a 10-cent cash fare with ten tokens for 50 cents, which went into effect on Jan. 1, was based on failure to earn a 7 per cent return. The valuation of the property was fixed by Judge Haight, who was special master in the company's application of 1921. In a letter to President McCarter, the commission stated that the company's operating income last year fell short by $3,300,000 of what a return of 7 per cent would have been upon the Haight valuation brought down to date. However, the commission also indicated that the company's operating revenue fell approximately $1,900,000 short of a 7 per cent return upon its own valuation at the same time, brought down to date.

An analysis of the earnings of the Public Service Co-ordinated Transport and its predecessors, the Public Service Railway and the Public Service Transportation Company, was made in a special article appearing recently in the Newark *Evening News*. The article points out that the only things about which the commission is concerned in its present decision are the operating income, that portion of the revenue remaining after deducting operating expenses, depreciation and taxes, and the valuation of the property placed on it by the authorities. The company's capitalization is not in any sense a factor, and it is only necessary that the company be allowed to earn a reasonable return upon the value of the property.

Nobody knows conclusively what a fair value of Public Service Co-ordinated Transport is, according to the article. There has been no valuation of the property since 1921, at least by the commission or the courts. In the 1921 fare case, there was a wide variance in the valuations submitted. The company claimed a value of approximately $200,000,000. An appraisal by Ford, Bacon & Davis, authorized by the Legislature, placed the value at $125,000,000. Mark Wolff, a utility expert, made a study resulting in an estimate of $100,000,000 historical cost. Other valuations were submitted.

After a study, the utilities commission finally decided that $82,000,000 was the value for rate-making purposes. The company carried the case to the federal courts and Judge Haight, as special master, found a value of not less than $110,000,000. These last two figures stand out, the one as the commission's findings and the other as the court's final decision.

Since 1921 there has been a revolution in the company's transportation methods. Buses have come to the fore and have passed trolleys in volume of business. Trolley lines have been abandoned and replaced by buses. How much remains of the original trolley inventory no one outside of Public Service itself knows. Therefore, nothing short of a new inventory and appraisal would establish what would be a fair value today.

Public Service has spent millions of dollars in acquiring bus lines and in purchasing new buses. It is debatable whether the company is entitled to receive a return upon the difference between a fair price for the buses and what it actually paid.

ANALYSIS OF RESULTS OF NEW JERSEY OPERATION

Year	Actual Operating Income	Needed Operating Income for 7 Per Cent Return on Judge Haight's Decision	P.U.C. 1921 Valuation	P.U.C. Valuation Less Bus Intangible
1922	$5,736,021	$7,820,139	$5,732,932	$5,732,932
1923	3,265,163	7,843,315	5,758,711	5,758,711
1924	4,055,052	7,909,172	5,831,989	5,750,247
1925	4,006,641	8,152,062	6,102,173	5,858,727
1926	5,046,933	8,635,193	6,639,827	6,132,061
1927	4,529,584	9,073,860	7,127,925	6,306,309
1928	5,602,252	9,379,738	7,476,001	6,504,390

In the first column of the accompanying tabulation is shown the operating income that Public Service actually has received, by years, through operation of its trolleys and buses, exclusive of the Public Service Railroad and interstate buses. These figures, by themselves, give no answer to the question of whether the company has been receiving a fair return upon the fair value of its properties. Using the several valuations, and bringing them down to date, the computation of earnings becomes simply a matter of mathematics.

Making the proper adjustment in the company's capital account for additions, withdrawals and retirements, and for accrued depreciation, the 7 per cent return on the basis of Judge Haight's decision has been figured out. This is shown in the second column of the tabulation. This exceeds by from $2,000,000 to nearly $4,000,000 the actual operating income of the company in the seven years examined.

If the original valuation made by the Public Utility Commission, which was $82,000,000 in 1921, be used as a rate base, with proper changes year by year, the 7 per cent return would be as shown in the third column. For the year 1922 this amount was virtually equal to the actual operating income. For each succeeding year it will be noted the deficiency in income has been greater. Even on this low basis the deficiency for 1928 was approximately $1,800,000.

Still another computation has been made, with deductions for the so-called intangible value of buses. It was the practice of the company, up to 1928, to divide the cost of buses between tangible and intangible value. The tangible value represented what the company believed the bus to be worth, while the balance between that and the price actually paid represented the intangible value. This intangible value, by years, has been between $2,000,000 and $4,500,000. Making a computation of earnings of 7 per cent upon the board's base valuation of 1921, with deductions for "intangible bus value," the figures given in the last column are obtained. Even using this basis, there is a deficiency in earnings in every year except 1922, varying between about $1,000,000 and $2,500,000.

Summarized, a 7 per cent return upon Judge Haight's valuation made in 1921 would total $58,813,483 for the period 1922-28. The total upon the board's valuation with inclusion of bus intangibles would be $44,669,562. With exclusion of all intangible bus values, the total for the period would be $42,043,380. The operating income of the company during that period has been $32,241,649.

Chicago Suburban Line Sold Under Foreclosure

The Hammond, Whiting & East Chicago Railway was sold at auction on Dec. 26 to a syndicate of business men headed by Morse DellPlain, president of the Northern Indiana Public Service Company. The sale was conducted by Ernest Force, special master in chancery, who acted under a decree of Federal Judge Slick. The sale price was $300,000.

A mortgage of $1,788,000 had previously been foreclosed on the property. The sale was approved on Dec. 28 by Judge Slick.

According to present plans the recently organized Calumet Railways, Inc., will take over the property. The Calumet Railways, Inc., seeks to obtain franchises from the three cities involved. If it is successful in doing this, the Insull organization will provide money for rehabilitation.

Ohio Interurban Sells Its Power Lines

Sale of all its power lines and poles, and the rights-of-way for such lines to the Ohio Edison Company, Springfield, Ohio, was announced on Dec. 26 by the Cincinnati & Lake Erie Railroad, the through electric railway system formed by the merger of the lines of the Cincinnati, Hamilton & Dayton Railway, the Indiana, Columbus & Eastern, and the Lima-Toledo Railway lines recently. The sale price was $350,000. Coincident with the announcement of the sale, the company also revealed that it was entering into a contract with the Springfield company whereby, in the future, the Ohio Edison Company will supply all of the power for the railway lines.

Program of Transportation Men Takes Shape

The meeting of the executive committee of the Transportation and Traffic Association held at the office of C. H. Evenson at Chicago on Dec. 10, 1929, was devoted largely to consideration of the program for the San Francisco convention in June. A letter of George B. Anderson, chairman of the program committee, announced tentative choice of speakers for the meeting and outlined the program for the three-day session. It was the opinion of those present that in the future fewer luncheon conferences should be held and that no subjects under study by the association committees should be chosen as topics for the luncheon meetings. President Samuel Riddle announced the completion of the membership of all committees.

The secretary was instructed to bring to the attention of the Accountants' executive committee the cost analysis methods set forth in the 1928 report of the committee on bus operation, and the 1929 report of the committee on the equipment and suggest the desirability of collaboration between the Accountants' and the Transportation and Traffic Associations in completing the study of such methods.

In the matter of the nomination and election of officers by the association at its convention it was decided that the election should take place at either the first or the second meeting rather than at the last session as is the present practice.

C. W. Wilson of the committee on the movement of the vehicle was instructed to elaborate to some extent on the work done by the previous committee and to give particular attention to the studies for the purpose of making recommendations on suitable parking regulations under various conditions. The committee was also instructed to study automobile registration in cities and its effect upon public transportation. W. W. Holden, chairman of the committee on "the passenger," said the work of his committee would depend largely on whether the employment of a specialist was authorized by the executive committee. The committee wanted to employ a well-known authority for making analyses in a selected group of cities, and unless this can be provided for, it will be necessary for the members of the committee to conduct the investigation only in the communities in which they reside.

A. C. Spurr, who is chairman of the committee on the "small city," stated that a sub-committee on procedure had been appointed and that this year special attention would be given to the subject of return on new capital invested and the results obtained with various fare systems in use. Committee members are to furnish data for their own properties and in addition each will visit several other properties to obtain such information as is available.

C. D. Smith, chairman of the committee on the transportation employee, said that this committee will give special attention to the subject of training from the standpoint of accident prevention, including the conference training method, job analysis, etc.

It was agreed to accept the invitation of Mr. Holden to hold a meeting in San Antonio on March 3, 1930.

NEWS BRIEFS

Continued from Page 54

South Bend, Ind.—Steadily increasing patronage has unqualifiedly approved the operation of Chicago, South Shore & South Bend Railroad de luxe trains. Reports show that the traveling public indorses the operation of parlor cars on dining car trains, for parlor car patronage on de luxe trains has increased from month to month since the line instituted this service last July.

✦

Trenton, N. J.—The Trenton Transit Company has been organized as the successor to the Trenton & Mercer County Traction Corporation. The new company really represents the consolidation of the railway with its former bus subsidiary, the Central Transportation Company.

✦

Allentown, Pa. — A bill for foreclosure of the first mortgage of $150,000 on the property of the Bethlehem & Nazareth Passenger Railway has been filed in the United States District Court at Philadelphia by the Guaranty Trust Company, New York, trustee for the bondholders. The bill was filed because the company defaulted in payment of bonds which matured May 1, 1929. The railway is being operated under lease by the Lehigh Valley Transit Company.

✦

Chicago, Ill.—The Illinois Commerce Commission on Dec. 18 approved the issuance by the Chicago, North Shore & Milwaukee Railroad of $700,000 Series G equipment trust certificates partially to cover the cost of 25 additional all-steel motor cars, delivery of which is to start on Feb. 1. It also approved the issuance of $522,000 first and refunding mortgage 5½ per cent bonds to reimburse the company treasury for expenditures made in the latter part of 1929 for improvements.

✦

New Orleans, La.—Racing fans desiring quick and efficient transportation to the tracks this season are invited to use the service of the Orleans-Kenner Traction Company, Inc., which is one of the quickest in the city and has an added advantage in that its cars stop only a few feet from the grandstand entrance of the race track. L. J. D'Aubiu, general superintendent of the Orleans-Kenner Traction Company, has made the most of this, realizing that patrons want speedy, efficient and comfortable service, which the company renders.

✦

Hampton, Va—Norman E. Drexler, general manager of the Public Service Company, has asked the Hampton City Council for permission to substitute buses for trolley cars on the east Hampton line.

✦

Jamestown, N. Y.—The Jamestown Motor Bus Transportation Company, a subsidiary of the Jamestown Street Railway, plans to extend its Fairmount Avenue line from the present terminus in Lakewood, N. Y., to the village of Ashville, making the one-way distance of that line 9 miles, instead of 6 as at present. The Jamestown Street Railway will continue its service between Jamestown and Ashville, the bus line being intended to augment the trolley service.

Portsmouth, Ohio—The Public Utilities Commission has authorized the Portsmouth Public Service Company to abandon service for a period of one year over its interurban line between Portsmouth and Ironton. The abandonment will be effective after 30 days notice to the public.

✦

Springfield, Mass. — A through bus service from Springfield to Boston, Mass., is to be started about Jan. 8 by the Springfield Street Railway in conjunction with the Worcester Consolidated and the Boston, Worcester & New York companies. Three round trips daily are proposed. This service is in addition to buses already in operation by the same agencies and will follow routes already authorized by state and municipal authorities, with the exception of a minor change in Springfield.

✦

San Diego, Cal.—The San Diego Electric Railway has notified the Councils of San Diego and National City that it has applied to the Railroad Commission for authority to abandon its lines and to remove the tracks from 32nd Street and Newton Avenue, San Diego, and thence on a private right-of-way to Dalbergia Street and National Avenue, thence on National Avenue along the pike to National City, thence on National Avenue to Twelfth Street and on Twelfth Street, National City, to a junction with the San Diego & Arizona Railroad. The company recently acquired the Sutherland Stages operating between National City and San Diego.

✦

Brooklyn, N. Y.—Irving Lee Bloch, vice-president of the Long Island Title & Guarantee Company, suggests the building of a four-track subway underneath the Atlantic Avenue route of the Long Island Railroad, the tearing down of the existing railroad tracks and the rebuilding of Atlantic Avenue into a motor parkway with direct egress from Jamaica, and the connection of such a Jamaica-Brooklyn subway system at the existing Flatbush Avenue terminal with the existing systems leading to other parts of Brooklyn and Manhattan.

✦

Kansas City, Mo.—Due to the Kansas City election and delay in the state valuation of the Kansas City Public Service Company, the street car fare issue before the Public Service Commission is about to be continued into April. The company has a 10-cent fare schedule on file at Jefferson City and the last six-month suspension ordered by the commission expires on Jan. 12. The Missouri statutes permit the commission to suspend a filed schedule twice before it must be denied or affirmed. Valuation will probably be completed in February.

✦

St. Louis, Mo. — The General Cab Company of Kansas City, and Los Angeles, Cal., on Jan. 4 will begin operations in St. Louis with a fleet of 54 Ford taxicabs. The fare will be 10 cents for flag pull and 10 cents for each additional half-mile compared with a 25-cent flag pull and 10 cents for each two-fifths of a mile charged by other companies in the St. Louis field. The new taxicab company plans to increase its fleet to 100 cars within a very few months.

Receivers for Albany, Syracuse and Rochester Lines

Federal Judge Frederick H. Bryant, at Malone, N. Y., on Dec. 28 appointed receivers for the United Traction Company of Albany, Troy and Cohoes, and for the New York State Railways, serving Rochester, Syracuse and Utica and owning lines running between Rochester and Little Falls.

Harry Weatherwax and Neil F. Towner, both of Albany, were named receivers for the United Traction, while Benjamin E. Tilton of Utica, and Wallace Pierce of Plattsburgh were named receivers for the New York State Railways.

The receivership was forced by an action of the General Finance Company, which alleged that United Traction owed about $195,000 on one note and $3,500,000 on another. The company also had some miscellaneous debts, it was stated, amounting to about $100,000. There was a mortgage of $420,000 due on Jan. 1 and some miscellaneous interest. The United Traction is said to have an accumulated deficit of about $10,000,000. Earnings for the last year were represented by counsel for the plaintiff as showing a deficit of more than $600,000. The allegation also asserted that the company had defaulted interest amounting to $80,000 on Nov. 1.

The Finance Company stated that the New York State Railways owed about $400,000 on open accounts and about $260,000 on labor claims and taxes.

Robert C. Watson, president of the Rochester Trust & Safe Deposit Company and member of the protective committee formed by bondholders of the Rochester Railway, which was taken over by the New York State Railways, characterized the receivership as a "smart move by the management of the railway lines to gain more time" and he said that the activities of the protective committee will be pressed with the greatest vigor. He said that he would make no attempt to interpret the legal phases of the receivership, but he viewed it as another means of "intimidating the bondholders to accept an unreasonable and unfair offer of conversion of their securities into those of the Association Gas & Electric Company." He is said to have charged that the attitude of the present management of the railways toward the bondholders shows that they are "wreckers, not builders."

J. H. Pardee, chairman of the New York State Railways, has sent a letter to the bondholders of the Rochester Railway outlining the status of the holders under the terms of the mortgages covering that property. The statement is technical and mostly of direct interest to the actual holders of the securities, but the following excerpt is of general interest:

"The service-at-cost plan expires on July 31 next. The plan provided that, if it were to be extended, notice of extension should be filed one year before the expiration date. No notice of extension was given and so far as we know there is no assurance on the part of the city of Rochester that it will extend the service-at-cost plan for any further period. If it is not extended and the Quimby decision upholding a 5-cent fare is held binding, the situation will be serious. We have had a statement made up showing the 5-cent fare applied to the number of revenue passengers carried for the year ended October, 1929, to see what the income statement would be if that fare had been in effect throughout the twelve-month period, with these results:

Operating expenses, maintenance, depreciation and taxes	$3,920,817
Operating revenue, other income	2,775,758
Operating loss before provision for bond interest	1,145,059

"The erroneous impression also seems to prevail that the Rochester Railway lines can be seized by the Rochester Railway first and second mortgage bondholders and operated independently of the New York State Railways. This cannot be done since substantial amounts of the equipment, as well as other property necessary for operation in Rochester, is subject to the first lien of our consolidated mortgage."

Under date of Dec. 21, 1929, H. C. Hopson, president of the Associated Gas & Electric Securities Company, which made an offer of exchange to bondholders, issued a statement in which he referred to the dangers of receivership. After reviewing briefly the history of the electric railway Mr. Hopson says that "most astute bankers and able students have for years worried about its future and greatly doubted its ability to survive. It came to be true some time ago that no well-informed person willingly invested a dollar in street railway securities unless he got the best security available at the time, and then only on a basis which he thought would compensate him for the risk being taken."

It seems that the Associated Gas & Electric System did not want the transportation system; that in fact it "unavoidably became the largest security holders of the traction system." Mr. Hopson says:

"As a result of acquisitions of electric and gas properties a few months ago, our interests also unavoidably became the largest security holder of the traction system in which you are a bondholder. We did not value our interest at much, if anything, but on the other hand our predecessors with less experience in the industry than ourselves had hope for it. Their advisors and the operators in charge of the properties were still optimistic that something might come about or be done to change the course of events. * * * It is obvious that those who have purchased securities of an interprise which is primarily engaged in the light and power business cannot be expected to be willing to have their money invested in another industry about which most investors feel decidedly pessimistic."

Later the offer of exchange for Albany Railway 5's was made 90 per cent of the face value instead of 40 per cent. Circulars to Albany Railway holders explained the change by saying that since the offer of 40 was made, "we have made a more extensive investigation of the operations of the company and of the value of the real estate subject to the lien of the mortgage securing the bonds which you hold." The new offer is made retroactive.

Conspectus of Indexes for December, 1929

Compiled for Publication in ELECTRIC RAILWAY JOURNAL by

ALBERT S. RICHEY

Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Last Five Years High	Last Five Years Low
Street Railway Fares* 1913 = 4.84	Dec., 1929 7.78	Nov., 1929 7.78	Dec., 1928 7.71	Nov., 1929 7.78	Nov., 1924 7.24
Electric Railway Materials* 1913 = 100	Dec., 1929 144.9	Nov., 1929 145.7	Dec., 1928 145.5	Dec., 1926 159.2	Feb., 1928 139.5
Electric Railway Wages* 1913 = 100	Dec., 1929 231.1	Nov., 1929 231.1	Dec., 1928 229.8	Nov., 1929 231.1	Dec., 1924 220.8
Electric Ry. Construction Cost Am. Elec. Ry. Assn. 1913 = 100	Dec., 1929 205.1	Nov., 1929 204.8	Dec., 1928 205.1	Nov., 1928 205.7	July, 1929 199.0
General Construction Cost Eng'g News-Record 1913 = 100	Dec., 1929 209.5	Nov., 1929 208.5	Dec., 1928 210.2	Jan., 1927 211.5	Nov., 1927 202.0
Wholesale Commodities U. S. Bur. Labor Stat. 1926 = 100	Nov., 1929 94.4	Oct., 1929 96.3	Nov., 1928 96.7	Nov., 1925 104.5	Apr., 1927 93.7
Wholesale Commodities Bradstreet 1913 = 9.21	Dec., 1929 12.24	Nov., 1929 12.40	Dec., 1928 13.15	Dec., 1925 14.41	Dec., 1929 12.24
Retail Food U. S. Bur. Labor Stat. 1913 = 100	Nov., 1929 157.9	Oct., 1929 160.5	Nov., 1928 157.3	Nov., 1925 167.1	Apr., 1925 150.8
Cost of Living Nat. Ind. Conf. Board 1914 = 100	Nov., 1929 163.0	Oct., 1929 163.4	Nov., 1928 162.6	Nov., 1925 171.8	Apr., 1929 159.3
Industrial Activity Elec. World, kw.-hr. 1923–25 = 100	Nov., 1929 122.9	Oct., 1929 134.6	Nov., 1928 135.0	Feb., 1929 140.4	Aug., 1925 94.3
Bank Clearings Outside N. Y. City 1926 = 100	Nov., 1929 111.2	Oct., 1929 111.8	Nov., 1928 104.0	Oct., 1929 111.8	Dec., 1924 90.07
Business Failures Number	Nov., 1929 1536	Oct., 1929 1511	Nov., 1928 1568	July, 1929 1581	Sept., 1928 1348
Liabilities, Millions of Dollars	53.86	29.51	54.23	102.09	23.13

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 136 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads.

Another Hearing on Rochester-Buffalo Service

Opposition on the part of the International Railway and the Buffalo Transit Company, Buffalo, to the application of the Rochester, Niagara Falls & Buffalo Coach Lines, Inc., for a certificate to operate buses between Rochester and Buffalo has prompted the Public Service Commission to adjourn the hearing again until Jan. 20.

Much of the testimony taken by Commissioner Pooley at the first adjourned hearing held in Buffalo centered about losses that the International Railway would sustain should it be deprived of the interchange of traffic with the Rochester, Lockport & Buffalo trolley line at Lockport. The Buffalo Transit Company, which now operates buses between Lockport and Buffalo, wants the Rochester, Niagara Falls & Buffalo Coach Lines, Inc., restricted from carrying local passengers in territory now covered by its bus system.

The capitalization of the proposed new bus line is $100,000. Authority is asked by the Rochester, Lockport & Buffalo Railway for permission to acquire the entire capital stock.

Substitution in Fishkill

The Public Service Commission has granted a petition by the Fishkill Electric Railway to substitute buses for trolley cars on part of its system in Beacon, N. Y., the city consenting to the substitution. Operation of trolley cars between Beacon and Fishkill will be continued. It is the intention of the company to supplement the bus operation by trolley cars when necessary, especially in the summer season. The company plans to put five buses in operation. The substitution, it is stated, will make for freer movements in the streets and a seven-minute headway, in place of the present ten-minute headway will be placed in operation. There will be no change in the existing fares, nor lessening of the number of scheduled trips.

Electric Railways Eliminated from Grade Crossing Removal Costs

The special commission created by the Legislature of Massachusetts to investigate the abolition of grade crossings has filed its final report with the General Court. The report recommends the establishment of an entirely new method for the abolition of such crossings. In brief, the special commission would give entire control of the work to the State through the Public Utilities Commission. A second innovation would be in the apportionment of the cost, which a majority believes should be so distributed that the state would pay 35 to 40 per cent, the railroad 50 per cent, the city and town not less than 5 per cent or more than 10 per cent, while the county may be assessed from nothing to a maximum of 10 per cent.

The report recommends the elimination of the electric railways from the cost assessments. It says:

"Because of the financial condition of the electric railways of the state, their decreasing revenues from rail service and the rapid trend toward bus service, these corporations have been eliminated from sharing in the costs, except under the voluntary agreement section. The electric railways will, however, pay for any changes in rails, poles or wires made necessary through change of grade or location due to the abolition of a grade crossing."

Rehearing Asked in Los Angeles Case

The City of Los Angeles and the California Railroad Commission on Dec. 23 appealed to the United States Supreme Court for a rehearing of the case in which the high court upheld a fare increase from 5 to 7 cents.

Early in December the Supreme Court handed down a decision granting the Los Angeles Railway the fare increase. A federal order previously had put the 7-cent fare into effect pending settlement of the suit. In petitioning for a rehearing of the case, the joint petition filed with the high court alleges the court erred in its decision on three grounds:

1. In holding that the city did not have power to prescribe franchise rates.
2. In not holding that the franchise rates would be binding to the railway if the California law was silent on the subject.
3. In holding that the California Railroad Commission had assumed jurisdiction over fares in 1921 and 1928.

The petitioners asserted that the court's decision "is constantly unsound and at direct variance with many decisions of it and other courts referred to in the brief of appellant."

The "Home Telephone case," relied upon in the court's majority opinion, is not applicable to the fare case, the petitioners contend. In that case it was held that the city did not have continuing power to regulate phone rates by prescribing rates in a charter, it was stated. The Los Angeles Railway filed its objection to a rehearing a few hours after the city-state petition was lodged with the court.

Justices Brandeis, Holmes and Stone dissented when the high court handed down its six-to-three opinion on Dec. 2. Justice Butler delivered the majority opinion. Both sides in the case are said to have admitted a 5-cent fare was not compensatory. The minority dissenting opinion stated that the high court exceeded its powers in interpreting the law of California as to whether the city had the right to contract for a fixed 5-cent fare.

Feeder Bus Controversy Settlement Ahead in Chicago

The controversy over the operation of feeder buses by the Surface Lines in Chicago's outlying districts, especially on the northwest side, may come to an end on Jan. 7 after two years of dispute. On that day a committee of Chicago Aldermen will appear before the Illinois Commerce Commission with a petition for more than 90 miles of routes. All indications are that their plea will be treated favorably. This would provide residents of the northwest side with a 7-cent feeder bus fare, with railway transfer privileges, as against the Chicago Motor Coach company's 10-cent fare without transfers.

After everything seemed well on the way to settlement, it became known on Dec. 30 that the Surface Lines plan to go before the commission on Jan. 14 with a request for authority to operate trolley buses on Diversey Avenue and motor buses on Belmont Avenue. Whether or not other service is contemplated is not known. In order to run the trolley buses the company must satisfy the city and the commission that this new type of transportation will be adequate, efficient and economical. Since the north side lines are in receivership, Federal Judge Wilkerson is in a position to prevent the lines from spending more money should the security holders take action.

Morgan Report Awaited at Detroit

A report showing that the Detroit Municipal Railway is being operated at a loss, despite the monthly financial statements indicating a profit, has been prepared by John H. Morgan, auditor, says the *Free Press*.

As Mr. Morgan explained the matter, he had made a report on questions raised by Senator Couzens and transmitted to him by Frank Couzens, member of the Street Railway Commission. He also said that he had completed a report on railway department insurance, and was working out a plan for figuring the depreciation on the equipment of the system.

As Mayor of Detroit in 1921 Senator James Couzens brought about the consolidation of all lines under city management. Since then he has shown a keen interest in the manner in which the system operated. The appointment of his son, Frank, to the Detroit Street Railway Commission, followed closely the primary election in October and the resignation of G. Ogden Ellis, who had served for many years as chairman.

Mr. Morgan stated in a meeting a few weeks ago that not one bus line was earning money. It is expected that the Morgan report will become an active issue just as soon as Mayor-Elect Charles Bowles takes office on Jan. 14.

New Edition of Engineering Manual Ready Soon

The 1929 edition of the Engineering Manual, which is the electric railway man's handbook of standards, recommended specifications, designs, methods, etc., and miscellaneous methods and practices that have been approved by the American Electric Railway Engineering Association, is in preparation.

It is very desirable that all users of the Engineering Manual obtain the 1929 issue, so that errors will not be made in using specifications that have been revised, withdrawn or superseded. Even when accompanied by the 1927 and 1928 supplements the 1926 edition cannot be brought up-to-date, since the revised and added material approved during 1929 would not be included. All new material from the past year in the new edition of the Manual has been printed there without first appearing in any supplements.

Several months ago association headquarters distributed an order blank to every operating member company. In addition, every holder of the 1926 edition will receive a separate letter, calling attention to the new edition. Others who desire the Manual may address their requests to association headquarters.

No price on the new edition has been definitely set, but it is probable that the cost will not change from that for the 1926 edition, i.e., $7.50 per copy to members and $10 to non-members.

PERSONAL MENTION

B. E. Tilton President of New York State Railways

Succeeds James F. Hamilton as Chief Executive at Rochester. E. K. Miles Manager in Syracuse. Many Other Changes on Central New York Systems

IMPORTANT changes in the executive personnel of the New York State Railways, made necessary by the resignation of James F. Hamilton as president, have been announced. Mr. Hamilton leaves the electric railway industry to become head of a large aircraft combine, the Aviation Corporation of America.

Benjamin E. Tilton, Syracuse, first vice-president, succeeds Mr. Hamilton as president.

H. B. Weatherwax, for many years vice-president of the United Traction Company, operating in the Capitol district, becomes president of the United Traction Company and the Schenectady Railway, posts formerly held by Mr. Hamilton.

Ernest Murphy, general manager of the United Company, will continue in that capacity, taking in addition the position of general manager of the Schenectady company.

Roy R. Hadsell, in charge of operations of the Schenectady company, becomes manager of that system and Ernest K. Miles, superintendent of transportation at Syracuse, will be appointed general manager of the Syracuse lines.

John F. Uffert, general superintendent of transportation and equipment of the Rochester lines, becomes general manager of the system in that city.

J. N. Jones, superintendent of transportation at Utica, is promoted to be general manager there. Howard L. Reichart, secretary-treasurer, and Joseph M. Joel, general auditor of the group, remain in the same positions.

Headquarters of the New York State Railways will remain in Rochester.

Besides being president of the New York State Railways, Mr. Hamilton was president and a director of eighteen subsidiary bus and railway companies, all controlled by the Associated Gas & Electric Company, with headquarters in New York.

William F. Stanton, assistant to Mr. Hamilton, will go with his chief to the new post.

Mr. Hamilton, now in his 52d year, began his career in the electric railway field as a motorman on the International Railway lines in Buffalo. He went to Rochester in 1917. Previously he was assistant superintendent of the Schenectady Railway, rising to the presidency in 1909. In 1911 he became general superintendent of the United Traction Company of Albany and in the following year general manager of both the United and Schenectady lines. He went to the New York State Railways as general manager. In 1918 he was made vice-president and assumed the presidency a few months later.

During his regime, the service-at-cost contract was negotiated between the city of Rochester and the railways. This grant has been in effect for the past ten years.

It was said of Mr. Tilton as far back as 1922 that no task is ever likely to master

B. E. Tilton

him that can be accomplished by the application of a combination of tact, tenacity and technology. Mr. Tilton brought all three of these adjuncts to bear on his first job down in Porto Rico with the government service making geodetic and coast surveys and he has been using the combination with success ever since. And with every new application of them by Mr. Tilton has come added ease in their use and greater success to their possessor through their application.

The government work in Porto Rico was Mr. Tilton's first job after he was graduated from Cornell in 1897. He was in Porto Rico for three years. And then came to Mr. Tilton the call of private enterprise. It was a loud call, and he heeded it to become engineer of construction of the Pennsylvania Lines West and was located at Fort Wayne and Cleveland for six years. At Cleveland Mr. Tilton's fine work attracted the attention of the management of the Cleveland Railway and he was induced to join the select circle of very able men who administer that property. His title there was engineer of maintenance of way. Then and there Mr. Tilton was won over to the electric railways. His next connection was with the Rochester Railway & Light Company as engineer of maintenance of way of city and suburban lines. The Rochester lines are tied in with the New York State Railways and so it was in reality only a step for Mr. Tilton in his upward climb to go from the post in Rochester to the position of general manager of the Syracuse Rapid Transit Company, Utica & Mohawk Valley Railway and the Oneida Railway. His election as vice-president followed quite logically. In this dual post at Syracuse Mr. Tilton had jurisdiction over the Oneida and the Utica lines. He is steeped in a knowledge of the history and affairs of the New York State Railways and his selection for the post of president followed just as logically as did his other promotions with the company.

J. F. Hamilton

✦

F. J. Tew in Another Foreign Post

F. J. Tew has resigned as superintendent of shops and equipment of the Sacramento Northern Railway, Sacramento, Cal., to accept a position with Emprezas Electricas Brasileiras, S. A., at Rio de Janeiro, Brazil, South America.

Mr. Tew received his early training in electric railway work with the Twin City Rapid Transit Company, being employed in the Snelling Avenue shops from 1904 to 1912 inclusive in various capacities in the different departments.

In November, 1912, he accepted the position of superintendent of shops and carhouses with the Manila Electric Railroad & Light Company at Manila, P. I., where he remained until 1920, at which time he returned to the United States.

Upon his arrival in California from Manila, Mr. Tew accepted the position of superintendent of shops with the Sacramento Northern Railway. At both Manila and Sacramento he was in entire charge of all mechanical and electrical shop work in connection with the maintenance of rolling stock, including city, suburban, interurban passenger and freight cars and heavy electric locomotives.

✦

C. J. Quill With North Coast Company

C. J. Quill has succeeded H. R. Leigh as superintendent of the North Coast Transportation Company, Seattle, Wash. Mr. Quill's transportation experience dates back to June, 1912, when he entered the employ of the Tacoma Railway & Power Company. He continued with this company until he enlisted for military service in 1917. Returning from military duty he re-entered the service of the Tacoma Railway & Power Company, which he served in several positions. In February, 1927, he was made general passenger agent for the North Coast Lines. On June 1, 1927, he was appointed assistant superintendent of the North Coast Lines, in which capacity he has since continued.

✦

G. S. Wills, former general manager of the Wheeling Traction Company, Wheeling, W. Va., and former general superintendent of the Steubenville, East Liverpool & Beaver Valley Traction Company, is now associated with the Pharo Engineering Company, Pittsburgh, Pa.

W. T. Rossell Vice-President of New Brooklyn System

W. T. Rossell, who has been general manager of the Pittsburgh Railways, Pittsburgh, Pa., has resigned to become vice-president of the Brooklyn & Queens Transit Corporation, Brooklyn, N. Y., which includes more than 500 miles of surface railway making up the Brooklyn City Railroad and the surface lines of the Brooklyn-Manhattan Transit Corporation.

Mr. Rossell has served as general manager at Pittsburgh since September, 1926. He succeeded F. R. Phillips in that post. He had previously been superintendent of way of the Pittsburgh Railways and general superintendent in charge of maintenance. He is another official schooled in engineering who has demonstrated his managerial ability.

The new Brooklyn vice-president was born in Memphis, Tenn., and was educated at Staten Island Academy, Staten Island, N. Y., from which he was graduated in 1904. Later he entered the United States Military Academy at West Point. In

W. T. Rossell

August, 1908, he became assistant engineer of track and structures for the Cincinnati Traction Company and the following year was connected with the York Manufacturing Company, York, Pa. In October, 1909, he returned to the Cincinnati Traction Company where he remained until 1916 when he became superintendent of track and structures for the Cincinnati, Newport & Covington Railway, operating out of Covington, Ky. Following his discharge from the army in June, 1919, as a captain of engineers, Mr. Rossell returned to the Cincinnati, Newport & Covington Railway as superintendent of way and structures, in which capacity he continued until his appointment as superintendent of way of the Pittsburgh Railways in July, 1924.

Thomas Fitzgerald, who has been vice-president of the Pittsburgh Railways, Pittsburgh, Pa., takes over in addition the title of general manager.

✦

Billy Mathewson Retires After Forty Years

Billy Mathewson of the United Electric Railway, Providence, R. I., has retired on pension. Mr. Mathewson entered the employ of the old Union Railroad in May, 1884, as a horse car driver, reporting at the Olneyville carhouse. After about five years service as a driver, he became assistant to Ellis R. Swan, superintendent at Olneyville at that time. Mr. Mathewson continued in this position until 1902, at which time he became superintendent of the Olneyville carhouse under the late Robert I. Todd, then general manager. He was superintendent of this carhouse for about fifteen years, going to the Riverside division in 1917. From Riverside Mr. Mathewson took charge of the newly established East Providence Division on March 30, 1924.

Mr. Mathewson continued there until November, 1926, when he took charge of the Mount Pleasant division upon the retirement of B. D. Sweet. He remained in the Mount Pleasant division until he retired on pension.

✦

L. E. Thorne With Gulf States Utilities

Lawrence E. Thorne, general superintendent of the Northern Texas Traction Company, will take charge of the Port Arthur division of the Gulf States Utilities Company, Fort Worth, Tex., a Stone & Webster subsidiary. Mr. Thorne studied electrical engineering at Texas Agricultural and Mechanical College. He entered the employ of the Northern Texas Traction Company in 1911 as chain man in a survey gang. He received rapid promotion and with the transfer in 1925 of General Superintendent V. W. Berry to the Virginia Power & Light Company, Mr. Thorne was made general superintendent of the local company.

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Messrs. Davis, Savage and Sherman With Car Company

C. E. Morgan, president, has announced a number of changes in the personnel of the Cincinnati Car Company, Cincinnati, Ohio. Lewis J. Davis has been made assistant to the president; Hugh Savage, superintendent of production, and Hugh K. Sherman, purchasing agent. The appointments as announced in an official bulletin are as follows:

L. J. Davis, assistant to the president, in charge of engineering and production, vice J. H. Elliott resigned.

Hugh Savage, superintendent of production, reporting to Mr. Davis.

C. J. Ellis, chief engineer, reporting to Mr. Davis.

H. K. Sherman, purchasing agent, in charge of the purchase of materials and supplies, as well as the handling and disposing of scrap and other materials. Mr. Sherman will also have charge of the general storeroom.

F. A. Latscha, assistant purchasing agent, reporting to Mr. Sherman.

C. F. Schnittger, general storekeeper, reporting to Mr. Sherman.

R. MacDonald, in charge of the service department.

A. L. Kasemeier continuing as vice-president, in charge of sales department.

Mr. Davis was assistant to Mr. Morgan as general manager of the Brooklyn City Railroad and, with the merging of the Brooklyn City lines with the Brooklyn-Manhattan Transit Corporation, became car engineer under William G. Gove.

Mr. Savage was formerly superintendent of equipment of the Brooklyn City Railroad, and before going to Brooklyn was superintendent of shops of the Detroit United Railway.

Mr. Sherman was purchasing agent of the Brooklyn City Railroad from Nov. 1, 1925, to July 1, 1929. Previous to that he was purchasing agent of the Michigan Electric Railway and the Michigan Railroad.

W. H. Gibson Purchasing Agent in Brooklyn

William H. Gibson has been appointed purchasing agent of the Brooklyn-Manhattan Transit system, to succeed the late Lincoln Van Cott. Mr. Gibson became connected with the Brooklyn companies in October, 1903, and advanced through the ranks in the purchasing department to his present position.

Mr. Gibson was born in Belleville, N. J., 49 years ago and after completing courses at the Belleville schools and a Newark business school he entered the employ of the Sprague Electric Company as a stock clerk. During his employment with the Sprague Company, Mr. Gibson advanced to the position of storekeeper and then accepted a similar position on the Manhattan Elevated Railway in New York City. He remained with the Manhattan "L" system for two years and then joined the staff of a hardware firm located in Manhattan.

In October, 1903, Mr. Van Cott selected Mr. Gibson to take charge of the store

W. H. Gibson

room at East New York for the Brooklyn Rapid Transit Company, predecessor to the present company. This was shortly after the consolidation of the Kings County "L" lines and the Brooklyn Union "L" lines as part of the Brooklyn Rapid Transit system. The work of converting the old "L" cars for electrical operation was then in progress at East New York and Mr. Gibson remained in charge of the storeroom there until the completion of that work.

He then spent a year on the staff of the late John F. Calderwood, general manager of the B. R. T. system at that time. Later he was appointed assistant general storekeeper for the B. R. T. system, under C. S. Waters, storekeeper. In 1906, when Mr. Waters took charge of the storerooms of the New York Municipal Railway Corporation following the signing of the dual subway contracts with the city of New York, Mr. Gibson was made general storekeeper. He was finally advanced to the position of assistant purchasing agent and general storekeeper in 1920 and continued as Mr. Van Cott's assistant until the latter's death.

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R. A. Pritchard, assistant superintendent of the railway at Little Rock, Ark., has been decorated with a pin denoting 25 years of service with the railway department of the Arkansas Power & Light Company. Mr. Pritchard entered the service of the railway in 1904 as conductor. Prior to that, at the age of nineteen, he went to work at a carhouse

in Knoxville, Tenn. At the time of the Spanish-American War he volunteered for service with Company F, First Alabama Infantry. He served under Gen. Fitzhugh Lee, of the 27th Corps, and helped clear the site for Miami, Fla., while the troops were there. After the close of the Spanish-American War he went to Little Rock as a conductor. In 1911 he was appointed supervisor and in 1923 was made assistant superintendent of the railway department.

✦

New Assistant to President at Richmond

I. Reid Carlisle has been appointed assistant to the president of the Virginia Electric & Power Company with headquarters in Richmond, Va., succeeding R. C. Hopkins, who was recently transferred to the Boston office of Stone & Webster. Mr. Reid assumed his duties on Dec. 9. He came to Virginia from Beaumont, Tex., where he was assistant to J. F. McLaughlin, formerly district

I. R. Carlisle

manager in that territory, and recently promoted to be vice-president of the Stone & Webster organization, with offices in Boston.

✦

Herman Russell Succeeds the Late Robert M. Searle

Herman Russell, for seven years executive vice-president of the Rochester Gas & Electric Corporation, Rochester, N. Y., has been named president of the company to succeed the late Robert M. Searle.

Mr. Russell, a native of Michigan, has been connected with the gas and electric corporation and its predecessor, the Rochester Railway & Light Company, for 23 years.

A graduate of the University of Michigan, he entered the public utility field with the Detroit Gas Company in 1900. Two years later he was made assistant superintendent of that company.

In 1903 he became superintendent of the gas manufacturing plant of the San Francisco Gas Company and a year later went to Cincinnati to take the post of assistant superintendent of the Cincinnati Gas & Electric Company.

For eight years, from 1906 to 1914, Mr. Russell served as assistant superintendent in Rochester, being elevated to the superintendency of the gas division in the latter year. He was appointed general manager in 1919 and was elected vice-president and director in 1922.

J. A. Davis

J. A. Davis Assistant at Norfolk

John A. Davis, Jr., who came to the Virginia Electric & Power Company in the capacity of a student engineer two years ago, has been promoted to be assistant to F. Carter Womack, manager of transportation in Norfolk, Va., in which territory service by electric railway and bus is co-ordinated. Mr. Davis left Richmond on Dec. 9 to assume his new duties. He is a native of Richmond and a graduate of the Virginia Polytechnic Institute. He joined the Stone & Webster forces in 1927. Mr. Davis formerly held the post of acting assistant to the president of the company, taking over the work of R. C. Hopkins, who was recently transferred to Boston and who on Dec. 9 was succeeded by I. Reid Carlisle.

✦

S. L. Williams Promoted by Westinghouse Air Brake

S. L. Williams has been appointed district engineer for the Eastern district of the Westinghouse Air Brake Company at New York. Mr. Williams was graduated from the Massachusetts Institute of Technology as a mechanical engineer in 1923, and immediately entered the employ of the Westinghouse Air Brake Company as special apprentice in the Wilmerding works. After serving for several months as inspector in Boston and New York, he was made assistant to the district engineer at the latter place in 1925. In 1928 he was transferred to the West Coast and promoted to be assistant district engineer of the Pacific District at San Francisco. This position he held until his recnt promotion.

S. L. Williams

OBITUARY

W. W. Briggs

Wallace W. Briggs, since 1925 vice-president in charge of operation for the Grays Harbor Railway & Light Company, Aberdeen, Wash., and also general manager and purchasing agent, died in that city on Dec. 9. His death was preceded by an immediate illness of only two days.

Mr. Briggs was well known in the West. For a number of years he was San Francisco district manager for the Westinghouse Electric & Manufacturing Company and later became general manager of the Great Western Power Company of California. In 1918 he joined the Westinghouse organization in New York and subsequently became affiliated with the Federal Light & Traction Company, which controls the Grays Harbor company. About the middle of 1925 he was sent from New York to become the operating head of the Grays Harbor property.

A genial, kindly man, he was "Wally" to all who knew him. An annual custom

W. W. Briggs

of his was to give a "Kids' Party" in the Electric Park power station grounds on his birthday to all the children of the community.

Mr. Briggs had become a very important figure in his community in the last four years, taking an active interest in civic affairs.

✦

Hugh A. Siggins, whose father, the late David Siggins, in 1892 incorporated the Warren Street Railway and the Warren & Jamestown Street Railway, Warren, Pa., died on Dec. 24 after a brief illness. With the retirement of his father from active management of the transportation lines, Mr. Siggins headed the two companies until they were sold to the Associated Gas & Electric Company several years ago. He was 52 years of age.

✦

Ormel W. Pierce, founder and president of the Railroad Trolley Guard Company, Olean, N. Y., died at his home in that city on Dec. 28, following a short illness. He was also head of the Olean Tile Manufacturing Company and was an officer of a number of other local industrial concerns. He was 63 years old.

✦

Mrs. Carrie Alexander Bahrenburg, widow of Henry Alexander, founder of the local railway at Belleville, Ill., and its operator for several years after her husband's death, died in Belleville, on Nov. 24. She was 68 years old.

INDUSTRY MARKET AND TRADE NEWS

Big Merger in Car Building Field

Plans involving an important expansion in the manufacturing activities of the Pullman company, through the acquisition by purchase of the Standard Steel Car Company and the Osgood Bradley Car Company have been announced, the entire transaction calling for an exchange of stock and cash to the amount of $50,000,000. Action on the merger will probably be confirmed at a meeting of the stockholders of Pullman, Inc., to be held in Wilmington, Del., on Jan. 28.

Standard Steel Car and Osgood Bradley Car own and operate plants manufacturing railway passenger and freight cars, street railway cars, steel forgings, gray iron castings, etc., at the following locations: Butler, Pa.; Hammond, Ind.; Baltimore; St. Paul; Richmond; Worcester; Sagamore, Mass.; Elwood City, Pa.; La Rochelle, France; and Rio de Janeiro. Besides these properties, Pullman, Inc., is acquiring sales offices in New York, Chicago, Pittsburgh, St. Paul, Baltimore, Richmond, London, Paris, Rio de Janeiro, Sao Paulo, Buenos Aires and Cape Town. The Middletown Car Company owns and operates a car assembling plant at Rio de Janeiro, while Entreprises Industrielles Charentaises owns and operates a freight and passenger car plant at La Rochelle, France, equipped to handle a general export business.

Lands and Buildings Included

In addition to the manufacturing plants and sales offices, Pullman, Inc., is acquiring certain lands, housing properties, owned by Standard Steel Car or subsidiaries. The inventories, receivables, etc., connected with the manufacturing plants are to be acquired for cash or equivalent in securities.

The properties being acquired will be operated by a newly incorporated subsidiary of Pullman, Inc., to be wholly owned by that company but to be operated separately from the Pullman's present manufacturing subsidiary, the Pullman Car & Manufacturing Corporation.

Entrance of the Mellon interests into Pullman's affairs is indicated by the election of R. K. Mellon as a director. Pittsburgh interests, including the Mellons, were largely interested in Standard Steel Car.

Freight Terminal Planned for South Bend, Ind.

The Chicago, South Shore & South Bend Railroad has acquired an 11½-acre tract in South Bend, Ind., as a site for a new freight terminal. The property was purchased in the name of the Indiana Industrial Land Company, and is adjacent to the tracks of the New York Central Railroad.

This is a further step in the improvement program begun four years ago when the present management took over the railroad. Rapid growth of carload and less-than-carload freight business in that period is the foundation for this new expansion.

The acquisition and development of this property according to plans of the line will enable the South Shore Line to offer shippers prompter and more convenient service, will eliminate the movement of freight over South Bend streets and will open up highly desirable sites for industries.

The South Shore Line will develop the site as a freight terminal and industrial site with inbound and outbound freight tracks and houses. Detailed plans for the installation of trackage and the reconditioning and construction of buildings on the property are being drawn up.

When the new terminal is completed, the South Shore Line will abandon its present freight terminal on La Salle Street east of Sycamore Street, and will discontinue the present method of handling less-than-carload freight in tractor-trailers over South Bend streets from the old freight house now located at Orange and Olive Streets.

Recent Rolling Stock Orders and Deliveries Include Thirty Units

CANADIAN as well as United States properties figured in a number of car orders and deliveries which were announced during the closing weeks of the year. The Ottawa Car & Manufacturing Company has received an order from the Hydro-Electric Power Commission of Ontario for four motor cars and one trail car for interurban service, delivery of which is to be made early in the new year. The motor cars will be of the four-motor, double-truck, double-end, one-man type, with seats for 50 passengers. Over-all length of the cars for Canadian service is to be 51 ft. 2 in.; over-all width, 8 ft. 4 in., and total weight of bodies, trucks and equipment is expected to approximate 58,000 lb.

The trail car is of the same general dimensions, with an estimated weight of 44,500 lb. Both motor and trail cars will be of

Details of Recent Rolling Stock Orders

Name of railway	Hydro Electric Power Commission of Ontario	British Columbia Electric Ry.	Youngstown Municipal Railway
City and State	Windsor, Ont.	Vancouver, B. C.	Youngstown, Oh
Number of units	4	15	13
Builder of car body	Ottawa Car Mfg. Company	Canadian Car & Foundry Company	Kuhlman Car Company.
Air brakes	Westinghouse	Westinghouse	Westinghouse; pedal.
Armature bearings	Plain	Plain	Roller.
Axles	A.E.R.E.A.	A.E.R.E.A. "E-4"	Brill special.
Car signal system	Faraday	Faraday	Bus type, with cord.
Compressors	Westinghouse DH-16	Westinghouse DH-25	General Electric
Conduit	Metal	Metal	Duratube flexible
Control	Westinghouse K-35	Westinghouse K-35	Westinghouse pedal.
Couplers	Tomlinson	Car builders	Brill.
Curtain fixtures	National Lock Washer Company	Curtain Supply Company	None.
Curtain material	Pantasote	Pantasote	None.
Destination signs	Hunter	Hunter	Hunter.
Door mechanism	National Pneumatic	National Pneumatic	Interlocked; selective valve.
Doors	Folding	Folding	Folding.
Fare boxes		Cleveland	Cleveland.
Finish (paint, enamel, lacquer)	Paint	Enamel	Duco.
Floor covering		Maple	Flexolith
Gears and pinions		Tool steel	W-N drive.
Glass	¼-in. plate	Plate	Plate.
Hand brakes	Peacock	Peacock	
Hand straps			Stanchions.
Heat insulating material	½ in. cork composition		
Heaters	General Electric	General Electric	Chromalun; thermostat control.
Headlights	Crouse Hinds	Golden Glow	Ohio Brass
Headlining	Agasote	Agasote	Haskelite.
Interior trim	Birch, cherry stained	Birch	Haskelite and wood, walnut finish.
Journal bearings	Plain	*Plain	Plain
Journal boxes		Car builders	Standard.
Lamp fixtures	Dome	Electric Service Supplies Company	Ivanhoe.
Motors	Four Westinghouse	Four Westinghouse No. 510 A	Four Westinghouse 35 hp.
Painting scheme		Red; cream trim	Brown and cream.
Registers	None		Ohmer.
Roof type	Arch	Arch	Arch.
Roof material	Basswood, canvas covered	Steel and wood; canvas covered	Wood; canvas covered
Safety car devices			
Sash fixtures		O. M. Edwards	O. M. Edwards.
Seats	Heywood-Wakefield	Car builders	Brill 210C.
Seat spacing	33 in.	30 in.	29½ in.
Seating material	Plush	Leather	Brown Spanish leather.
Slack adjusters	Westinghouse	American automatic	
Steps	Folding	Folding	Stationary.
Step treads	Universal	Irving	Kass Safety.
Trolley	Ohio Brass, No. 13119	Earll retrievers	Ohio Brass.
Trolley base	Ohio Brass	Ohio Brass	Ohio Brass
Trolley wheels	Ohio Brass, 5-in.	Ohio Brass 5 in.	Ohio Brass.
Trucks	Baldwin	Car builders	Brill No. 177 E-1-X.
Ventilators	Nichols Lintern	Nichols Lintern	Brill standard.
Wheels, type	Rolled steel, 33 in.	Rolled steel, 26 in.	Rolled steel 22 in.
Wheelguards or fenders	Pilot	Wheel guards	H-B tray type life guard.

*One car with SKF bearings.

semi-steel construction, with end doors and arch roof.

The Canadian Car & Foundry Company, of Montreal, recently delivered to the British Columbia Electric Railway fifteen one-man two-man, single-end, double-truck motor cars for city service in Vancouver, B. C. The cars, which are of the pay-as-you-pass type, with single treadle exit door at center and at rear end, are of all-steel construction, with the exception of some members, which are made of duralumin to save weight. Over-all length is 46 ft. 2 in., and total weight is about 38,000 lb. Arch roof construction is employed.

The Youngstown Municipal Railway has placed an order with the Kuhlman Car Company, Cleveland, for thirteen one-man, double-end, double-truck motor cars for city service in Youngstown, delivery of which is to be made Feb. 1. Steel, wood and aluminum are used in the body construction, and it is expected that the total weight will be held down to 28,000 lb. There will be end doors and arch roofs. Length over all is 40 ft. 6 in., with length over the body posts of 26 ft. 5 in. Bolster centers are 17 ft. 2 in., and truck wheelbase is 5 ft., 1 in. Brakes are of the Westinghouse foot pedal, variable load type, with automotive-type hand brake.

Outside finish will be of Duco, with enamel used for interior finish and trim. Vestibule windows will be of non-shatterable glass. Door mechanism is interlocked, with selective valve control. Cars will be driven by four 35-hp. Westinghouse motors, with WN drive.

The J. G. Brill Company announces that it has received an order from the Delaware Electric Power Company, Wilmington, for twelve more cars similar in type to the two previous orders of ten cars each, which were delivered late in 1928 and during the summer of 1929. The cars were described in detail in the ELECTRIC RAILWAY JOURNAL of Dec. 15, 1928.

Equipment specifications on a number of the recent purchases are set forth in the accompanying table.

Bus Manufacturers Close Year with L

FOR extension of existing facilities and for replacement purposes, orders and deliveries of a considerable number of buses have been recorded lately by electric railways and their subsidiaries.

The Brooklyn Bus Corporation, subsidiary of the Brooklyn & Queens Transit Corporation, has received ten Twin Coaches, twelve ACF metropolitan type coaches, and two Yellow 38-passenger buses, a number of which have been placed in service on the Manhattan Bridge route, pending the granting of further operating rights by the city of New York. The Los Angeles Motor Bus Company, operated jointly by the Los Angeles Railway and the Pacific Electric Railway, has received twelve Twin Coaches of the urban type, bringing its total number of vehicles of this type to 26. Other recent deliveries of Twin Coaches include ten to the Northern Texas Traction Company, of Fort Worth, five to the San Diego Electric Railway, and one to the Portland Electric Power Company, all of the urban type, seating 40 passengers. The Twin Coach Corporation has also delivered six trackless trolleys to the Utah Light & Traction Company for service in Salt Lake City, and one rail street car of 52-passenger capacity to the Brooklyn & Queens Transit Corporation for trial operation.

A notable recent installation is that of the North Coast Transportation Company, one of the Stone & Webster transportation lines operating out of Seattle, which has received four 37-passenger parlor observation coaches, mounted on ACF 264-in. wheelbase chassis and equipped with 175-hp. Hall-Scott engines. The same company has also received two 37-passenger parlor car coaches, mounted on the new ACF 240-in. wheelbase chassis and equipped with 120-hp. Hall-Scott engines. Other deliveries of ACF equipment include two 23-passenger urban coaches to Pioneer Transportation, Inc., two 33-passenger urban coaches to the Interstate Street Railway, of Attleboro, Mass., and one 40-passenger, all-steel metropolitan type coach each to the Portland Electric Power Company, the San Diego Electric Railway, and the New Orleans Public Service Company.

International Motor Truck Corporation reports the delivery of Mack buses to the following electric railway companies: four six-cylinder, 25-passenger parlor car buses to the Cincinnati Street Railway, one four-cylinder 29-passenger city type bus to the Denver Tramway Company, and one four-cylinder 177-in. chassis to the Peoples' Motor Coach Company, of Indianapolis, the last named being a subsidiary of the Indianapolis Street Railway. Orders for Mack buses are also reported from the Lehigh Valley Transit Company and the Cincinnati Street Railway, which is adding ten 29-passenger city type buses, powered with six-cylinder engines, to its fleet.

General Motors Truck Company reports delivery of one Type W city service bus to the Springfield Traction Company, Springfield, Mo.; three Type W observation buses to the Fort Dodge, Des Moines & Southern Railroad, Boone, Iowa; two Type W city service buses to the Oklahoma Railway, Oklahoma City; one Type Z 29-passenger bus to the Cumberland & Westernport Transportation Company, Cumberland, Md.; and six buses to the Georgia Power Company. Public Service Co-ordinated Transport has taken delivery of ten 38-passenger Yellow coaches, mounted with Lang bodies. The Fifth Avenue Coach Company, of New York, has placed an order with the General Motors Truck Company for 100 Type Z 225 chassis, for double deck bodies. These buses are being ordered to replace obsolete equipment, and delivery is to start early in the year.

Alliance System Being Improved

A moving picture camera is being used by C. E. Sperow, general manager of the Stark Electric Railroad, Alliance, Ohio, to record improvements being made over the division. Wherever new work is being done Mr. Sperow is on hand to record its various phases. These records are kept for future reference.

The Stark Electric is completing its 1929 rehabilitation program which includes considerable work over the 35-mile link. Two concrete spans have been replaced with steel bridges. Ten thousand new ties were installed. There was a similar number of new ties last year, while the 1930 program calls for 15,000.

New overhead wires were placed on most of the line in Alliance. About half a mile of 100-lb. rails was installed with thermit-weld joints throughout. In the business district, sections of old rail were replaced with new rails, all joints being welded.

In addition to this work, the company constructed a new track on Liberty Avenue while this street was being repaved by the city.

Converter Substations for Wilkes-Barre

The Wilkes-Barre Railway, Wilkes-Barre, Pa., recently changed its policy of generating its own electrical energy and now intends to purchase power from three local power companies. The power companies will supply power to eight new synchronous converter substations, equipments being built by the Westinghouse Electric & Manufacturing Company.

There will be six 750-kw. synchronous converter substations and two 500-kw. converter substations. Two of the 750-kw. stations and one 500-kw. station will be for automatic operation, while the others will be the manually controlled type.

All of the synchronous converters will be of the shunt wound type. They will operate in conjunction with transformers having 8 per cent reactance. This type of machine was specified by the purchaser to obtain superior voltage and power factor characteristics, and also to afford stability to the substations while operating together on a common feeder network.

Signal Equipment Being Installed on Gary Railways

Work of modernizing the signal equipment of Gary Railways, Gary, Ind., which has been in progress for more than a year, is proceeding apace. The cost of the 96 block signals alone will be approximately $65,000, and the cost of wire and labor will amount to an additional $35,000. The most recent installations have been between Valparaiso and Woodville. When the Valparaiso division is finished there will remain only the Crown Point and Hobart divisions. Signals for these sections have been ordered and work will get under way shortly after the first of the year.

Improving Winnipeg

Track improvements involving a total expenditure of over $340,000 have been made during the past year by the Winnipeg Electric Company.

The biggest item was the Main Street trackage, where double tracks were laid inside the old tracks, thus allowing more space at the sides for other vehicular traffic. This work cost $135,000. The track is 115-lb. steel laid on steel ties. The steel tie was used for the first time in Winnipeg. Elastite filler alongside the rail to absorb shock, and thermit-welded joints were two of the modern devices in track construction used.

Double track extension on Stafford, from Grosvenor to Lorette, cost $104,400, and meant laying 3,000 ft. of new double track. The extension on Corydon, from Lilac to Wilton, was 2,900 ft., and cost $81,760.

A single track extension of 2,000 ft. from Midland to Worth on Notre Dame Avenue cost $10,615.

70,000,000 miles of

33-passenger City Type Bus

Pennjersey Garage in the Camden District

Simplex Multiple Unit Clasp Brakes

Speed is today's byword. Greater Speed, faster service, better schedules—these are the demands on practically every transportation organization today.

Without a doubt deceleration is as important a factor in maintaining schedules as acceleration or running speed. It's the *most important* factor where speed with safety is concerned.

Simplex Multiple Unit Clasp Brakes offer today's method of braking to meet today's demands in speed. Two brake shoes per wheel *double* the braking area and *halve* the wear on braking equipment.

Balanced braking has *many* advantages. Study the features outlined here. Details and blueprints will be sent at your request.

STEEL FOUNDRIES

CHICAGO ST. LOUIS

TYPICAL RECORDS DENOTING *the* OUTSTANDING SUPERIORITY *of* Firestone

GUM-DIPPED TRUCK & BUS BALLOON

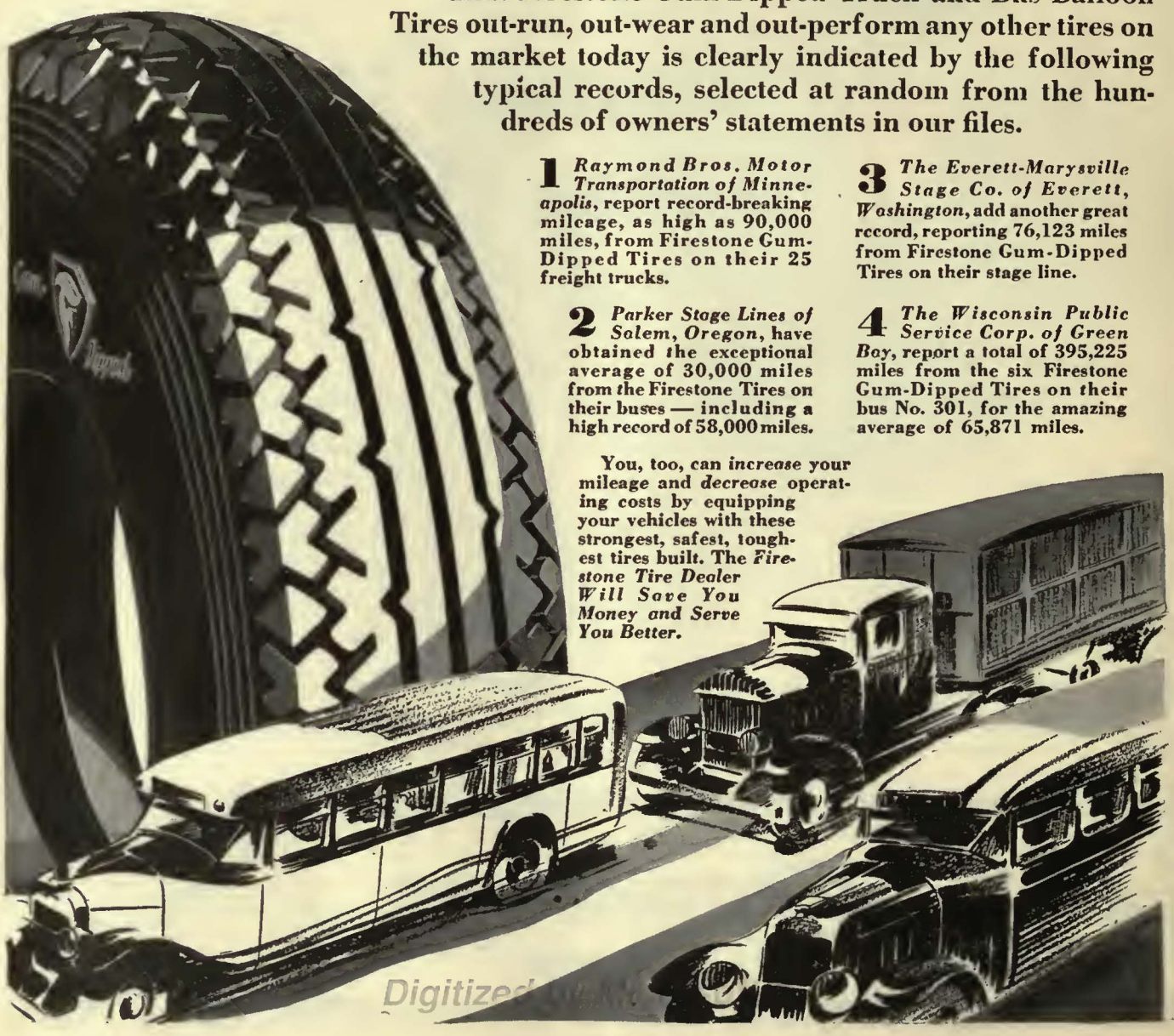
That Firestone Gum-Dipped Truck and Bus Balloon Tires out-run, out-wear and out-perform any other tires on the market today is clearly indicated by the following typical records, selected at random from the hundreds of owners' statements in our files.

1 *Raymond Bros. Motor Transportation of Minneapolis*, report record-breaking mileage, as high as 90,000 miles, from Firestone Gum-Dipped Tires on their 25 freight trucks.

2 *Parker Stage Lines of Salem, Oregon*, have obtained the exceptional average of 30,000 miles from the Firestone Tires on their buses — including a high record of 58,000 miles.

3 *The Everett-Marysville Stage Co. of Everett, Washington*, add another great record, reporting 76,123 miles from Firestone Gum-Dipped Tires on their stage line.

4 *The Wisconsin Public Service Corp. of Green Bay*, report a total of 395,225 miles from the six Firestone Gum-Dipped Tires on their bus No. 301, for the amazing average of 65,871 miles.



You, too, can *increase* your mileage and *decrease* operating costs by equipping your vehicles with these strongest, safest, toughest tires built. The *Firestone Tire Dealer Will Save You Money and Serve You Better.*

THOMAS-BUILT CARS

assure comfortable efficient transportation

THE North Carolina Public Service Company is just another company that, wishing to give its patrons the utmost in comfort, efficiency and safety in transportation, has selected "Thomas-Built Cars."

Thomas-Built Cars are designed with sufficient strength to meet all requirements and yet not be of excessive weight. Structural simplicity, combined with lasting strength and fine appearance, makes the Thomas-Built Car ideal for satisfactory service.

This construction, typical of our cars, is an important feature in that it helps to cut the cost of maintenance.

PERLEY A. THOMAS CAR WORKS

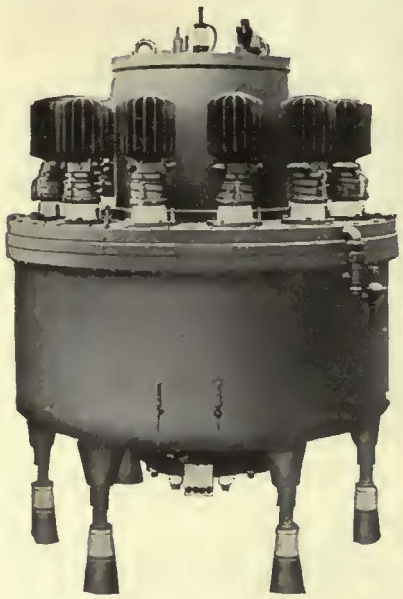
HIGH POINT, N. C.

The "DIE-HARDS" stuck to the stagecoach

The superior transportation offered by the iron horse was no inducement to the die-hards—not because of any reason, but merely because they were die-hards.

For the resistance of the die-hards lingers on long after the merits of a new product have been proved beyond any reasonable doubt.

To the "DIE-HARDS" in the electric railway industry



The day of the mercury arc power rectifier is here. Its performance record in hundreds of important installations has established it with the whole electrical industry as dependable, economical equipment. It converts current without noise, without vibration, without rotating parts, without special buildings, and without special foundations.

Its operation may be completely automatic and it may be controlled from a distance. At our Camden plant are engineers who figured prominently in the early development of the rectifier. Their services are at your disposal.

ABB

American Brown Boveri Co., Inc.

Camden, N. J.

AMERICAN BROWN BOVERI

PREFERENCE OF

PATRONS

HIGH

COSTS

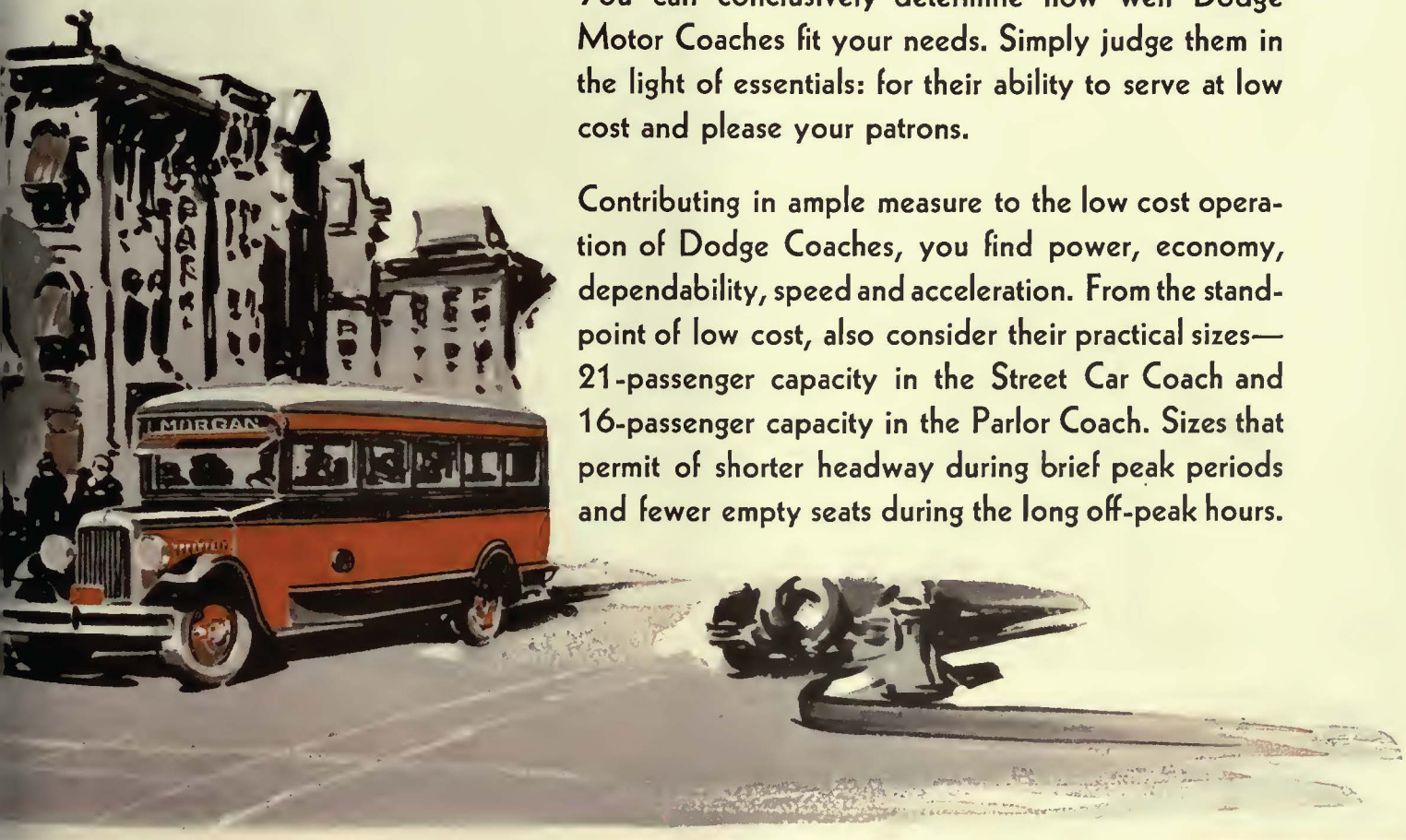
LOW

Your costs low—

DODGE BROTHERS

your patrons pleased with Dodge Coaches

No operator asks for more—no motor coach can provide more » » » »



You can conclusively determine how well Dodge Motor Coaches fit your needs. Simply judge them in the light of essentials: for their ability to serve at low cost and please your patrons.

Contributing in ample measure to the low cost operation of Dodge Coaches, you find power, economy, dependability, speed and acceleration. From the standpoint of low cost, also consider their practical sizes—21-passenger capacity in the Street Car Coach and 16-passenger capacity in the Parlor Coach. Sizes that permit of shorter headway during brief peak periods and fewer empty seats during the long off-peak hours.

MOTOR COACHES

Contributing to low maintenance costs

ROOF, of Haskelite, supported by laminated ribs, is strong and weave-proof. Heavy felt padding between top covering and wood effectively protects the covering.

INSULATED BODY WIRING is carried in channel in dome-light rail. Greater protection and ease of access result.

DRIP MOULDING is amply deep and of heavy construction. It provides the needed protection to insure efficient drainage in all weather.

CADMIUM PLATED SCREWS, exclusively, are used in construction of body. These rust-resisting screws prevent premature destruction of the wood at points used.

ALL WOOD PARTS are of oak, thoroughly lead primed. Body will endure for a longer period.

EACH OUTSIDE METAL PANEL overlaps the one immediately below it. All joints are covered with half-oval aluminum moulding. Such care insures in design and construction more effective weatherproofing, a more finished appearance and longer life.

SKID RAILS, on sides and rear of coach, provide added safety for passengers and material protection to body.

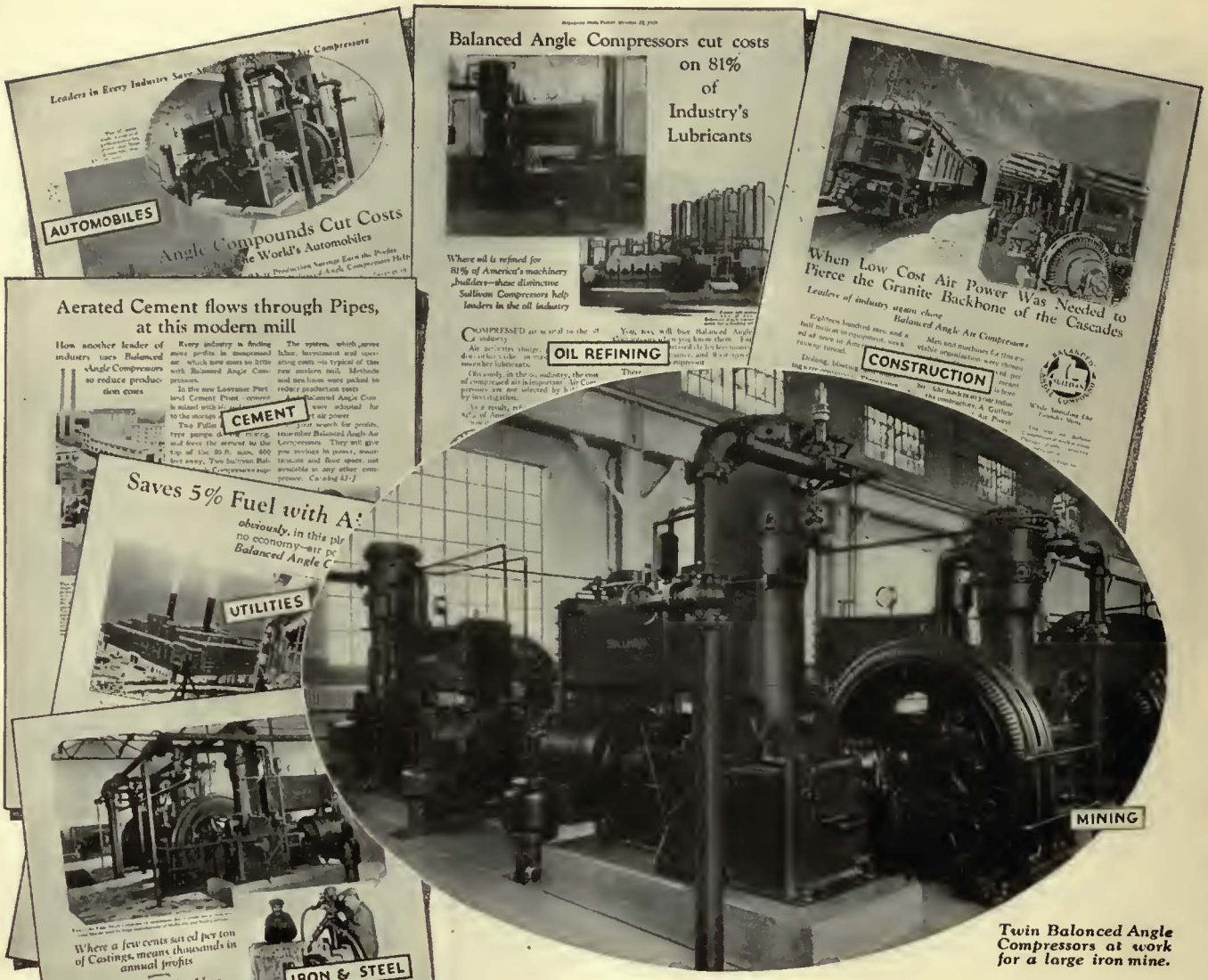
SKIRTING is securely braced and adequately protected by sturdy angle irons. Long body-life and protection in even unusually severe coach service, are assured.

WINDOWS are of brass sash with pinch locks operating on brass slides. They are free from rattle.

Add to this list of advantages such motor coach essentials as metal nonskid entrance step, removable safety mat in aisle and genuine leather seats of sturdy, enduring construction. Body maintenance costs are sure to be low.

B-1279

DODGE BROTHERS
MOTOR COACHES



Twin Balanced Angle Compressors at work for a large iron mine.

Big Business Adopts Balanced Angle Compressors

Big business is setting a new pace. Facts—not opinions—are guiding its methods and selection of machines.

And big business has adopted air power by Balanced Angle Compressors.

Builders of half the world's automobiles—

Makers of two-thirds of America's electrical equipment—

Refiners of eighty percent of industry's lubricants—

Great foundries, power plants, lumber mills, mines—

—now save money with Balanced Angle Air Compressors.

For these distinctive machines have proved their ability to supply air for less power, and lower maintenance.

The facts that persuaded big business to use Sullivan Compressors are available for you.

Send for Booklet 83-J.

SULLIVAN
MACHINERY COMPANY

809 Wrigley Building Chicago, U. S. A.

Offices in all principal cities in the world

Send for portfolio of advertisements showing Balanced Angle Compressors, in plants of industry's leaders.

More Brill-Timken Trains

Because they practically eliminate starting resistance—because they need lubricating less often—because they require merely routine attention even after thousands upon thousands of miles, Timken Bearings have established themselves with both the builders and the operators of cars. Timkens are more than just anti-friction bearings. The total carrying ability of Timken tapered construction, Timken *POSITIVELY ALIGNED ROLLS* and Timken steel includes radial, thrust and combined loads.

TIMKEN BEARING EQUIPPED

Without compromise—without complication—Timken Bearings materially help in putting rail transportation on a more economical basis.

THE TIMKEN ROLLER BEARING CO.
C A N T O N, O H I O

TIMKEN
Tapered
ROLLER BEARINGS

THE CHOICE OF LEADING BUS FLEETS—because of its outstanding record

The U. S. Royal Heavy Service Tire asks no odds when it goes into bus service.

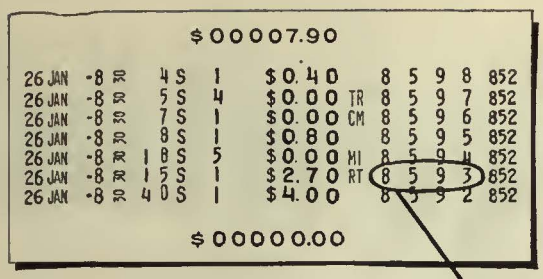
Its record on many of the country's most prominent fleets stands as full proof of its ability to deliver trouble-free mileage at low cost.

For those operators changing to balloons—the U. S. Royal Heavy Service Balloon is in equally high favor because it has qualified as having the same superior qualities associated with the high pressure Royal Heavy Service.

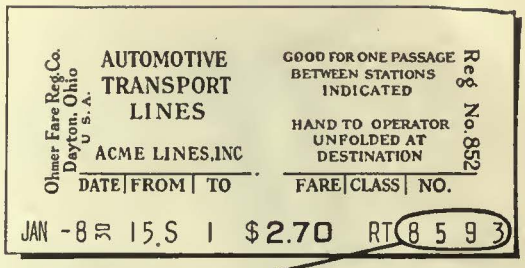
UNITED STATES US RUBBER COMPANY
THE WORLD'S LARGEST PRODUCER OF RUBBER

U. S. ROYAL HEAVY SERVICE BALLOON

The great fleet of de luxe motor cooches operated by Union Pacific Stoges, Incorporated, covering the northwest, are equipped with U. S. Royal Heavy Service Tires to meet the demands of a transportation service famous for its smooth operation.



Here is a section of the detail strip from a Class 80 Register. Because of the wide detail strip (4¼ inches) a complete record with proper column spacing is made possible.



Tickets issued from OHMER Registers give exactly the same information as the detail strip. They are of the same shape and size, and have the same value to passengers as purchased railroad tickets.

8593

Consecutive Number on
Detail Strip *and* Ticket

Only OHMER *gives you this added protection*

HERE'S a feature that you need on all your ticket-printing fare registers. It's a feature that was developed by transportation specialists to give you added protection through a complete check on every sale.

When the consecutive number appears on detail strip *and* ticket, you can positively identify each ticket with the corresponding sale on the detail strip. You can save time by auditing fares consecutively . . . a system impossible with any other register. You can make checking definite and simple.

And in addition, the detail strip carries the operator's number . . . another feature that makes the audit of sales even more positive and more accurate.

Other information appearing on the detail strip and ticket is the *Date,* the *From* and *To* stations, the *Division* traveled, and the *Amount* and *Class* of fare. No other fare register in the world gives so much information and so much protection.

+ + +

The Class 80 Register with large visual indicator shows the oumbers of the From and To stations and the amount and class of fare. This register has the exclusive OHMER pre-indicating feature which makes it possible to detect mistakes before registration. Repeat tickets can beissued by pressing a single button. The register is electrically or manually operated.

Now . . . a more perfect "On and Off" Check

Our transportation specialists have devised a new "On and Off" check. It is simple, accurate and sure. We want you to see how it works. Send for your free copy of the folder in which it is completely described.

OHMER

REG. U.S. PAT. OFF. AND OTHER COUNTRIES

FARE REGISTER COMPANY

Dayton. Ohio. U. S. A.

9-30

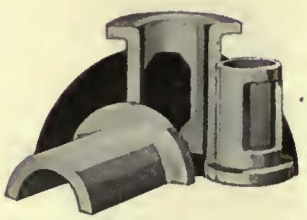
An Essential

quality materials

sound engineering

extensive facilities

Trolley Wheels and Harps



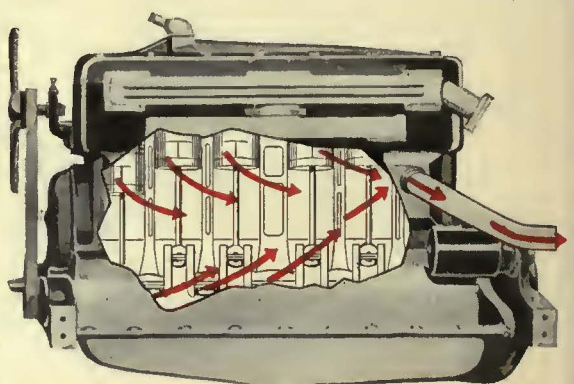
"Tiger" Bronze Axle and Armature Bearings

M-J Armature Babbitt

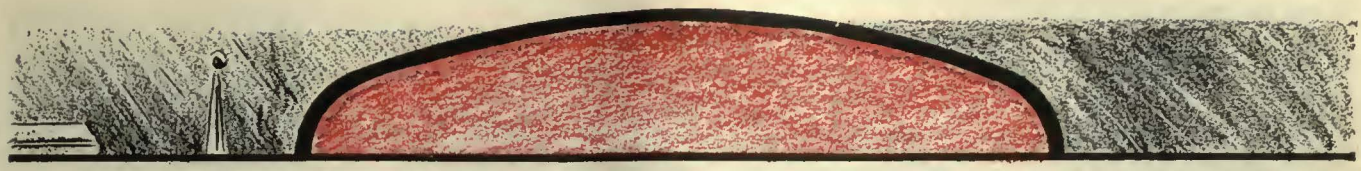
THIS WINTER-

The suction pipe connects with dome-shaped ventilating heads in the floor of the bus, drawing out the foul, cold air, and causing efficient circulation of warm, fresh air without drafts.

The Vac-Vent Ejector, the heart of the system. Exhaust gases from the motor in leaving the jet, create a powerful suction in the surrounding chamber. This is the operating force upon which the Vac-Vent system depends. A vacuum pressure of two pounds is often produced.

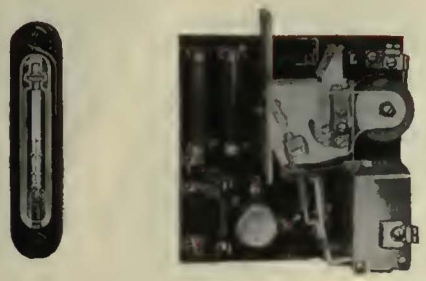


The vacuum set up in the Vac-Vent ejector draws off the vapors, gas fumes, carbon particles and excessive heat, which ordinarily mix with the crankcase oil, reduce the motor life, blow out the breather, and get into the body.



UTILITY means ECONOMY AND SERVICE

Below — Thermo-control and Heat Regulator Panel. Note the simplicity of assembly and rugged construction.



The Chromalox Strip shown below is the heart of the Utility Chromalox Cross Seat Heater. An unusually efficient heating unit listed as standard by Underwriters' Laboratories.

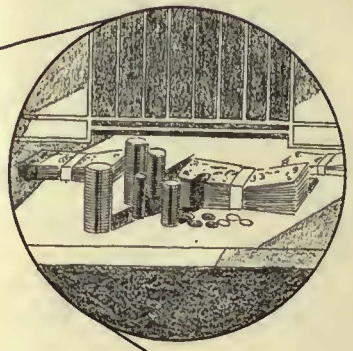
UTILITY Heating and Ventilating Systems, render adequate ventilation and proper car temperatures, providing comfortable transportation that increases revenue. Furthermore, many old heating systems are wasteful and uneconomical. Again you may be dividing your profits by unnecessarily high heating costs.

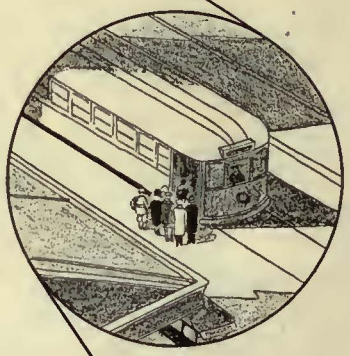
Let us tell you about Utility Compensating Systems of natural ventilation.

RAILWAY UTILITY COMPANY

2241 TO 2247 INDIANA AVE. CHICAGO, ILLINOIS

J. H. Denton—Eastern Manager 1328 Broadway, New York City

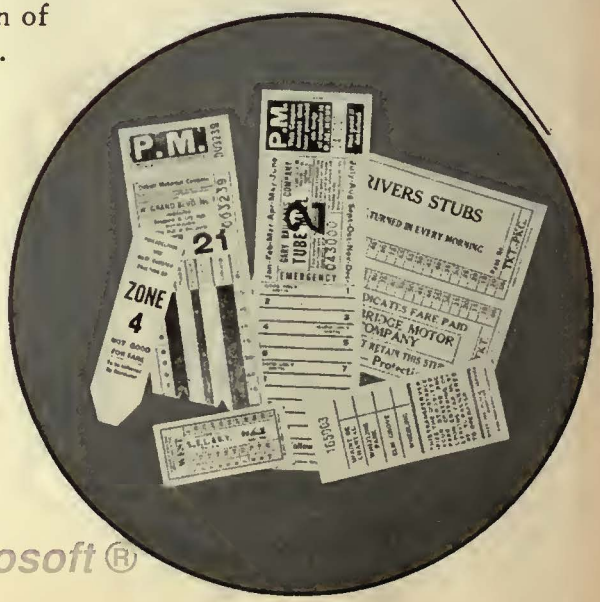




Globe designed tickets and transfers help you realize most on every riding dollar

A transfer designed to eliminate a large percentage of the ever-present abuses at transfer points; a ticket designed to save the conductor's time and eliminate change-making, a "hat check" to eliminate overriding, a weekly and Sunday-pass to increase riding during off-peak hours and to give revenue in advance . . . these are a few of the concrete examples of Globe service in assisting operating companies to solve their fare problems.

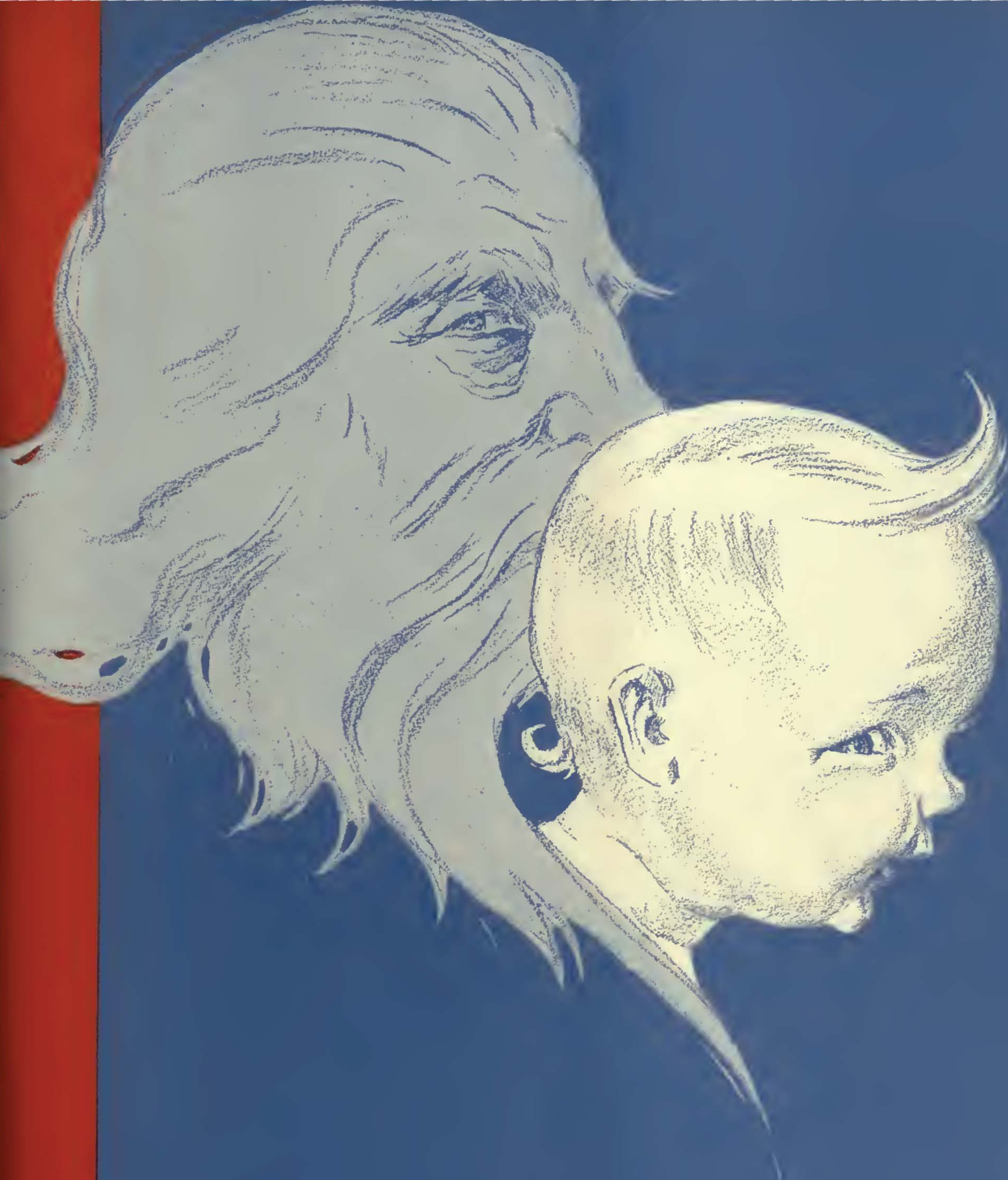
Globe service has the verbal and written O.K. of most of the important operators. Globe experience is a tangible asset . . . resulting in increased revenue for you, and the elimination of fare difficulties. Write.



Globe
TICKET COMPANY
PHILADELPHIA

Factories:
Philadelphia Los Angelea Boston New York Jacksonville

Sales Offices:
Syracuse Cincinnati Pittsburgh
Baltimore Cleveland Springfield, Masa.



Time changes
but


1928 records of
buses bought by
electric railways
show
TwinCoach 1st
in large capacity buses bo
TwinCoach 2
in total buses bought

1929

Again

in the year just ended Twin Coach maintains its position; repeats its success of 1928.

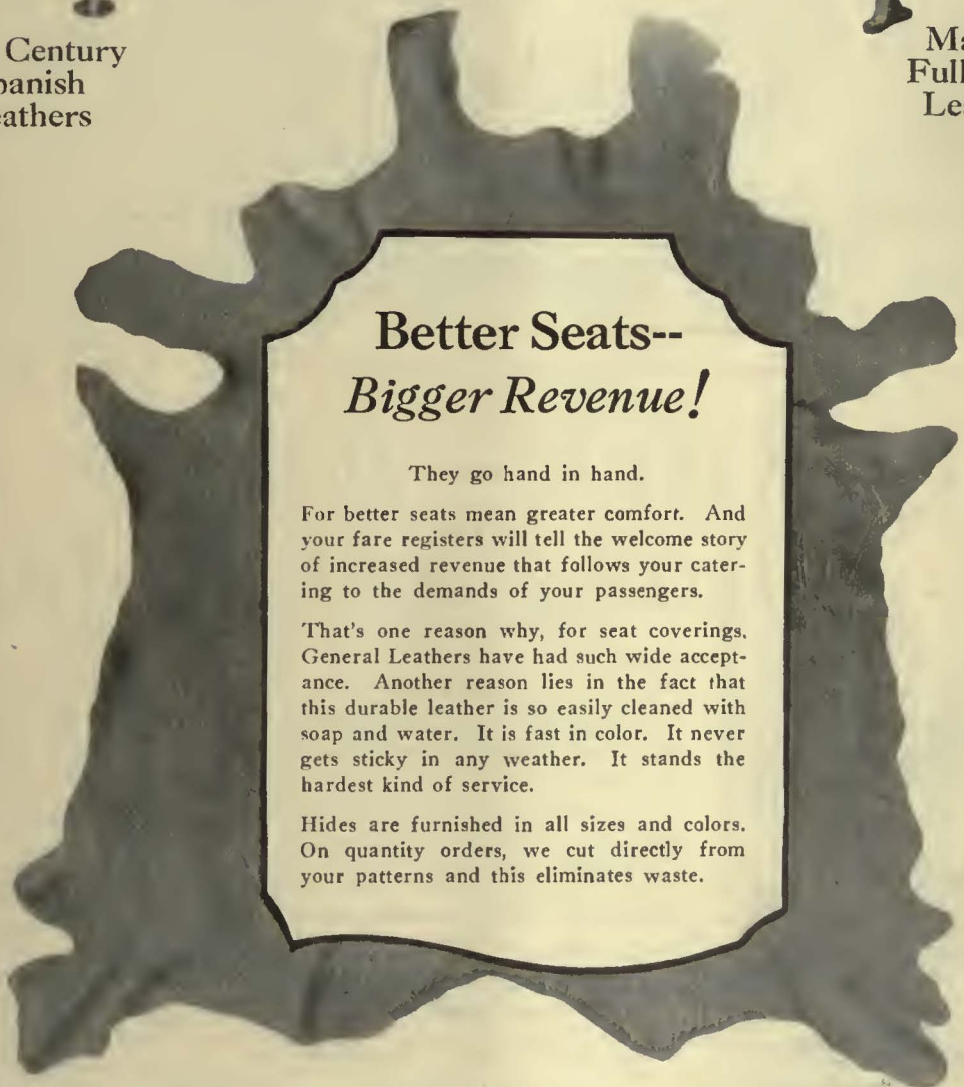
This success is represented by the sale to electric railways of nearly 40% more 37-40 passenger coaches than were sold by all other coach manufacturers combined.

The railways requiring large capacity street car type vehicles realize that such units to succeed must be built as Twin Coaches are built—with body and chassis integral.

Twin Coach
BY F.R.FAGEOL KENT, OHIO

20th Century Spanish Leathers

Majestic Full Grain Leathers



Better Seats-- *Bigger Revenue!*

They go hand in hand.

For better seats mean greater comfort. And your fare registers will tell the welcome story of increased revenue that follows your catering to the demands of your passengers.

That's one reason why, for seat coverings, General Leathers have had such wide acceptance. Another reason lies in the fact that this durable leather is so easily cleaned with soap and water. It is fast in color. It never gets sticky in any weather. It stands the hardest kind of service.

Hides are furnished in all sizes and colors. On quantity orders, we cut directly from your patterns and this eliminates waste.

Write for samples. Specify General Leathers on your Cars, Buses and Taxi-Cabs or when you overhaul your seat coverings.

GENERAL LEATHER COMPANY

Makers of Famous Tried and Proven "00" Leathers

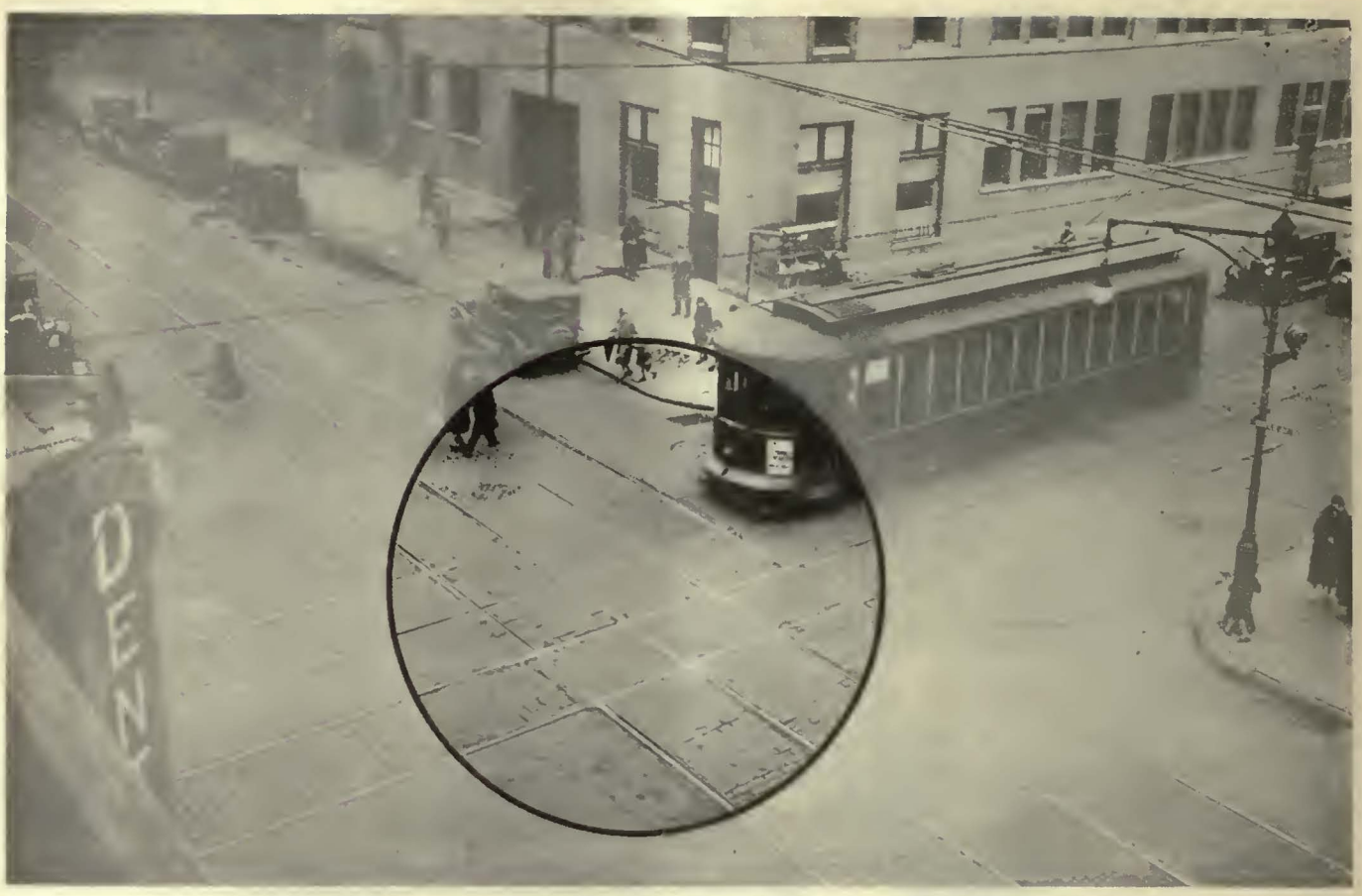
NEWARK, N. J.

Detroit Office
Stoddard Lovely & Co.
10-219 General Motors Bldg.

Colonial Traders, Inc.
78 Williams St.
Chatham, Ont.

London Office
R. & A. Kohnstamm, Ltd.
21 West Smithfield, London, E. C.

West Coast Office
A. J. & J. R. Cook, Inc.
237 Eighth St., San Francisco



Bethlehem Silico-Manganese Weldable Crossing at Ralph and Gates Avenues, Brooklyn, N. Y.

Trackwork—*that is wear-resisting and* Weldable

Installing a Bethlehem Silico-Manganese Weldable Three-Way Turnout. Bethlehem trackwork is assembled in spacious, well-lighted shops by careful workmen to insure quick and easy installation in the field.

Increasingly heavy traffic requires trackwork that is wear-resisting, weldable and thoroughly dependable. Bethlehem Silico-Manganese Trackwork, Design 999, meets all of these requirements. It can be installed at heavy traffic locations with confidence that it will stand up under the most severe service conditions.

Bethlehem Silico-Manganese Trackwork is remarkably wear-resisting and is readily weldable by any of the standard methods, such as electric arc, oxy-acetylene and Thermit Welding.

BETHLEHEM STEEL COMPANY

General Offices: **Bethlehem, Pa.**

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland, and Honolulu.

BETHLEHEM Silico-Manganese Trackwork / Design 999

Wheels—*that meet the demands of modern traffic*

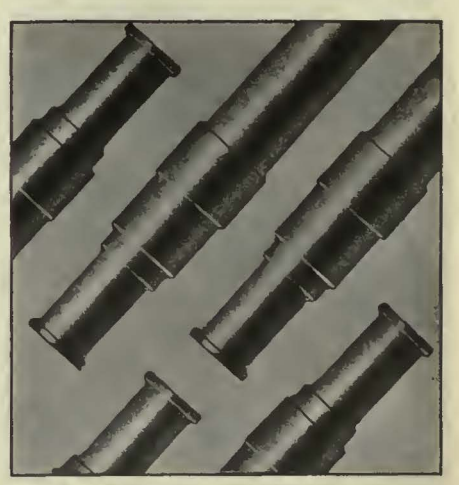
The exceptionally severe service that car wheels undergo today greatly reduces the life of ordinary wheels. Wheels that meet modern traffic conditions must be good wheels.

Bethlehem manufactures and offers to electric railways a wrought steel wheel that has the strength, endurance and wearing qualities to stand up and deliver exceptional mileage under severe modern traffic conditions. Five distinct forging and rolling operations are required to make a Bethlehem Wheel. The forging gives the metal toughness and density. The rolling establishes a uniform grain structure throughout the wheel virtually eliminating crystallization and reducing to a minimum the possibility of breakage.

When you use Bethlehem Wrought Steel Wheels you can rest assured that you will receive from each wheel many thousands of miles of trouble-free service.

BETHLEHEM STEEL COMPANY
General Offices: Bethlehem, Pa.
District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland, and Honolulu.

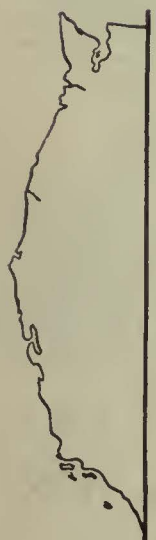
BETHLEHEM
Wrought Steel Wheels *and* Forged Axles

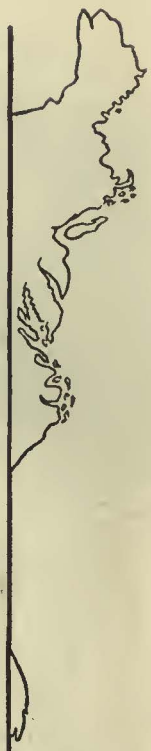


FORGED AXLES

Extreme care is exercised in the manufacture of Bethlehem Axles. Special heat treatment gives them ductility and a high elastic limit. They give excellent service under severe torsional stresses.

Mile after Mile of smoother, quieter transportation





ALL over the country—from coast to coast—electric railway systems are adopting the Carey Elastite System of Track Insulation. Mile after mile of new rails will be Carey-insulated, in 1930.

Traction officials approve it because it means lower maintenance costs. The public approves it because it muffles noise—makes for smoother, more pleasant transportation.

Carey Elastite Track Insulation is climate-proof, rot-proof. Water seepage does not affect it—nor does the Summer sun or Winter frost. It eliminates joint ruts, pavement buckling between rails, cracking and spalling of adjoining concrete.

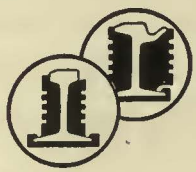
Is it any wonder that you see such a growing use of this product?

If you have any questions to ask about the Carey Elastite System of Track Insulation—write. Full details will be presented to you without obligation.

THE PHILIP CAREY COMPANY
Lockland, CINCINNATI, OHIO

Carey Elastite System of Track Insulation is preformed, under heavy pressure, of durable asphaltic compound, substantially reenforced with asphalt-saturated fibre.

Carey Elastite
REG. U.S. PAT. OFF.
TRADE MARK REG'D. U.S. PATENT OFFICE



SYSTEM OF
TRACK INSULATION

Carey Elastite Electric Railway Products

Carey Elastite Expansion Joint
Carey Elastite Asphalt Plank
for bridge flooring
for water-proofing overhead bridges
Carey Elastite Trunking for signals

50 YEARS

have seen a revolution in the generation of direct current

Above. *An Edison 250-light type K generator in use from 1883 to 1928. Equipped with copper leaf brushes.*

At right. *Modern 4200 KW Rotary Converter, 285 volts, 14,800 amperes. Equipped with National Pyramid Brushes.*

THE past fifty years have witnessed tremendous changes in the design of electrical machinery for the supply of direct current. Throughout these years, National Carbon Company, Inc., has been an outstanding leader in developing new and more efficient carbon brushes for the successful operation of these machines.

When the incandescent lamp was in its infancy, the Edison generator illustrated above was used as the source of electrical power. This generator was belt-driven from a steam engine. Its approximate capacity of 25 kilowatts was considered high.

Compare this with the methods of today. Most direct-current power in use today is initially generated as alternating current, often by units with a capacity of over 100,000 KVA. It is transmitted at high voltage to sub-stations where it is transformed to lower voltage and converted to direct current by means of huge rotary converters. The modern rotary converter illustrated herewith is a typical example.

The various designs of machinery necessary for the collection and redistribution of electrical energy in this highly efficient way would be impossible without carbon brushes. Scientific research in the up-to-the-minute Research Laboratories of National Carbon Company, Inc., always has kept (and still keeps) pace with the ever-changing demands placed on the many types of carbon brushes required.

Engineering science in our laboratories and carefully supervised workmanship in our factories are maintaining for National Pyramid Brushes the leadership established through the years.

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide UCC *and Carbon Corporation*

Carbon Sales Division — SILVER STRAND CABLE TRADE MARK REGISTERED — Cleveland, Ohio

Branch Offices and Factories

New York Pittsburgh Chicago Birmingham San Francisco

If SKF Wasn't Quite So Big....

"The Highest Priced Bearing in the World" Would Be Higher Priced

SKF Ball and Roller Bearings have never been sold on any other basis than performance. They can't be. No other bearing in the world costs so much—to buy or to make. But there are other bearings, many of them, that cost more—*much* more—to USE.

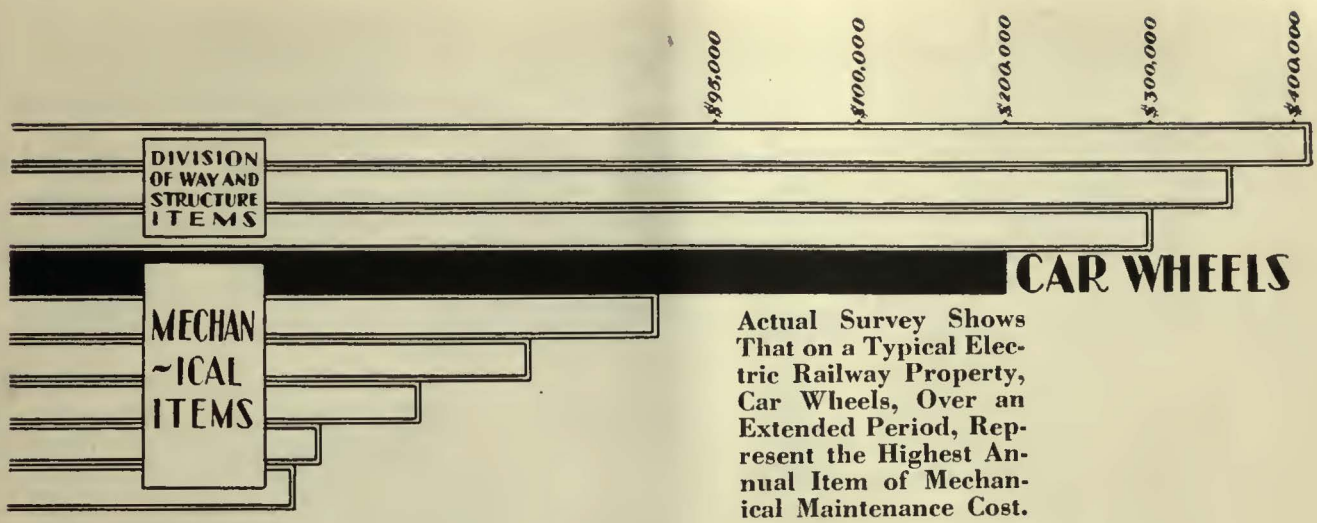
SKF produces not one type but many different types of anti-friction bearings. The special ores it requires come from its own mines. The charcoal it uses in processing its special steels comes from its own forests. Its laboratories, plants, factory branches extend right 'round the world. Among its 23,000 employees 27 languages are spoken.

SKF supplies greater service to *more* customers in *more* places than any other anti-friction bearing manufacturer in the world. And SKF makes "the highest priced bearing in the world."

SKF INDUSTRIES, INCORPORATED
40 East 34th Street, New York, N.Y.

2439

THE HIGHEST PRICED BEARING IN THE WORLD



Actual Survey Shows That on a Typical Electric Railway Property, Car Wheels, Over an Extended Period, Represent the Highest Annual Item of Mechanical Maintenance Cost.

CARWHEEL BUDGETS FOR 1930

WILL BE LOWER FOR THE MANY REPRESENTATIVE ELECTRIC RAILWAY COMPANIES NOW USING

NACO

SPUN STEEL CAR WHEELS

TO SERVE the industry effectively by supplying better car wheels—this was our purpose five years ago when engaging in the manufacture of wheels.

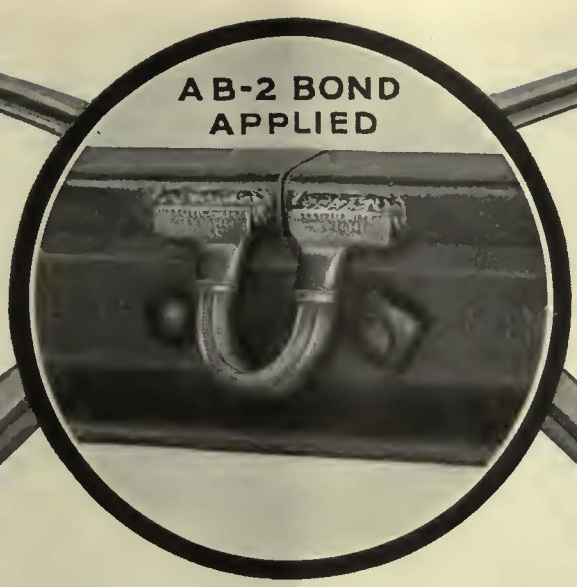
IN THE meantime, actual results covering severe service accurately computed on several properties have definitely established our product as a progressive and timely development.

When arranging your program for the coming year, write NACO SPUN STEEL WHEELS into your specifications for regular replacement use, and for any new car construction. This will lead to lower car wheel budgets over ensuing periods.

National Malleable & Steel Castings Co.

General Offices: Cleveland, Ohio

STEEL PLANTS: Sharon, Pa., Chicago, Melrose Park, Ill.



Bond Performance

One of the advantages of buying American Steel and Wire Company Rail Bonds is the assurance you will have of dependable performance. The reason is materials, design, and construction. Our experience has been of the kind that is worth money to you in Bond performance.

The AB-2 Bond is easily and quickly applied with a steel electrode. The open shape of this Bond terminal is especially desirable since the arc can be directed freely at the junction of the terminal and the rail.

Would you be interested in inspecting a sample?

AMERICAN STEEL & WIRE COMPANY

208 S. La Salle Street, Chicago 30 Church Street, New York
And All Principal Cities

SUBSIDIARY OF
UNITED STATES STEEL CORPORATION

Quality Products *Dependable Service*

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES:

American Bridge Company
American Sheet and Tin Plate Company
American Steel and Wire Company
Carnegie Steel Company
Cyclone Fence Company
Federal Shipbuilding and Dry Dock Company
Illinois Steel Company
Minnesota Steel Company
National Tube Company
The Lorain Steel Company
Tennessee Coal, Iron & R. R. Company
Universal Portland Cement Company

Pacific Coast Distributors—United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle, Honolulu. *Export Distributors*—United States Steel Products Company, New York City

Typical installations of Union Metal Fluted Steel Poles

POLES— STRAIGHT STRONG and STURDY

TYPICAL of this modern age is the Union Metal Fluted Steel Pole. Designed with the City Beautiful ideal in mind, it is gracefully tapered and fluted in the manner of architectural columns. Here is no ordinary pole, no public eyesore. Straight, strong and sturdy, Union Metal Poles stand in even rows along the curb-line, monuments to the foresight of progressive utility operators.

Because they are fabricated from heavy steel, they are strong enough to withstand heavy side strains. And because of their strength—and appearance—one set of poles may be used to support lighting units, trolley span wires, traffic signals, and distribution and transmission lines. The result is true economy for the users of the poles and o decided improvement in street appearance.

THE UNION METAL MANUFACTURING CO.
GENERAL OFFICES AND FACTORY: CANTON, OHIO
SALES OFFICES: New York, Chicago, Philadelphia, Cleveland, Boston, Los Angeles, San Francisco, Seattle, Dallas, Atlanta

DISTRIBUTORS
General Electric Supply Corp. Graybar Electric Company, Inc.
Offices in all principle cities

Distributed by GRAYBAR

UNION METAL

MERCHANDISE DISTRIBUTOR

DISTRIBUTION AND TRANSMISSION POLES

Mahon Spray Booths installed at the Niles Center Shops of the Chicago Rapid Transit Co.

. . . an *Essential* Part of *Your* Maintenance Equipment

The indisputable economy of Spray Painting . . . the smoother, more durable lacquer finishes . . . the tremendous reduction in the out of service time required for refinishing, and the increased capacity of your paint shop makes Spray Painting Facilities an essential part of your maintenance equipment. ¶ Many Street Railways are seriously considering the adoption of this modern means of cost reduction . . . You too, will install Spray Painting facilities in your paint shop.

¶ When you are contemplating this equipment, remember that Mahon engineers are recognized the world over as a highly specialized staff of Spray Booth experts . . . remember also, that it cost no more for the services of these specialists whose widely diversified experience will prove of inestimable value to you in the economical solution of your Spray Booth problems, both in initial cost and in operating expense over a period of time. Arrange a consultation with Mahon engineers today.

THE R. C. MAHON COMPANY

DETROIT, MICHIGAN

Manufacturers of Spray Booths and Exhaust Stacks, Industrial Drying Ovens and Blow Pipe Systems.

MAHON

SPRAY BOOTHS & EXHAUST STACKS

• DESIGNED FOR FIRE SAFETY •

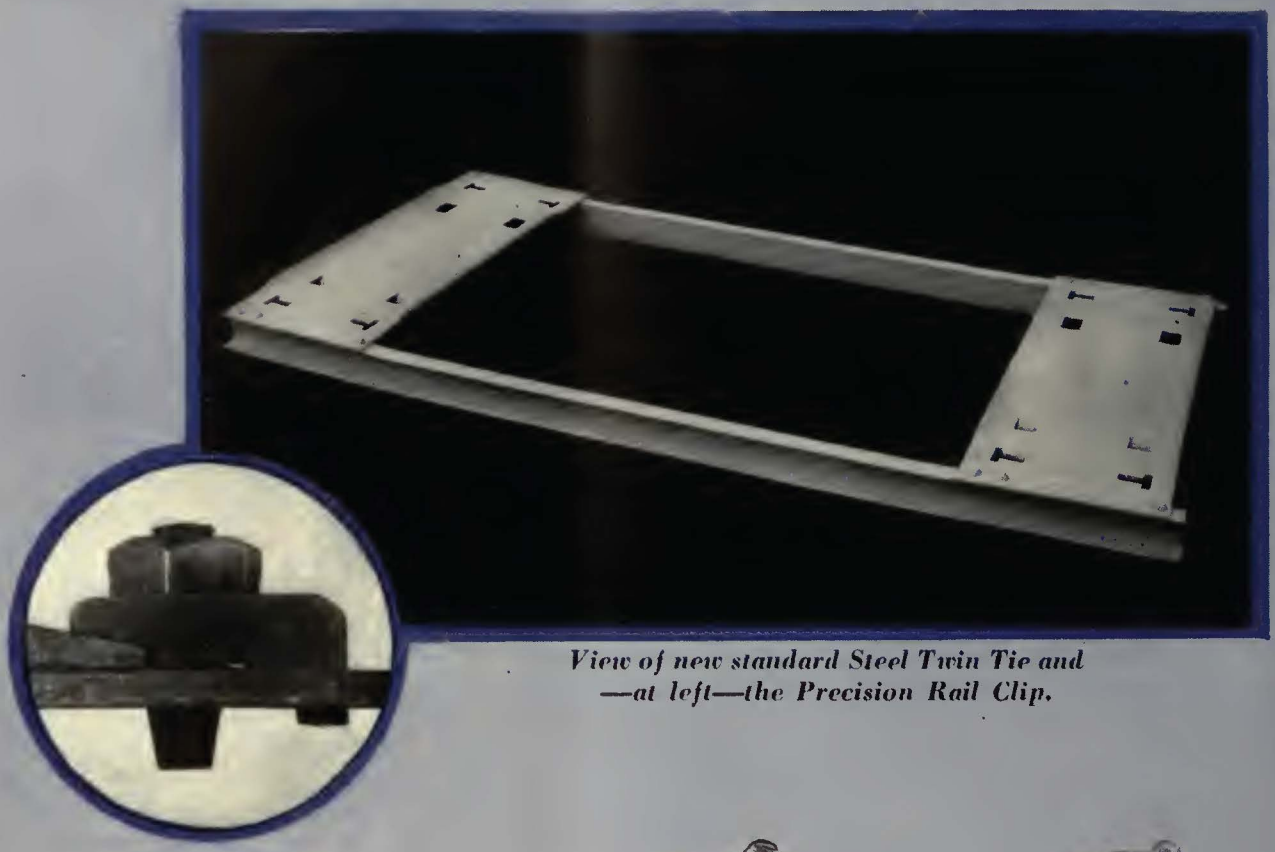
When You Plan

1930 Paved Track Construction

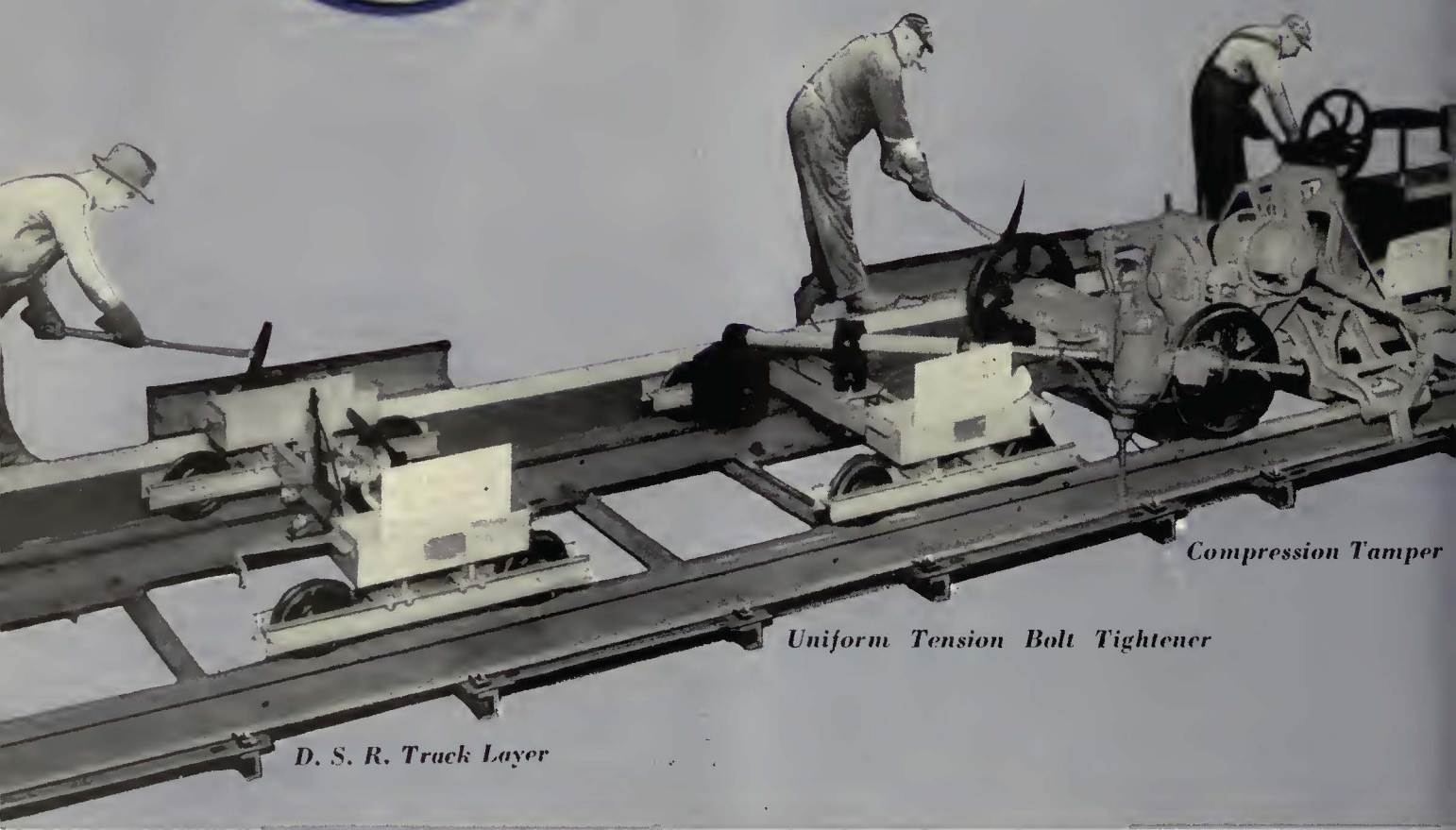
Remember there is only *one way* to put track in the street *exactly* like the plan

***Uniform Mechanical Methods and* STEEL TWIN TIES**

To Put The Track In The



View of new standard Steel Twin Tie and —at left—the Precision Rail Clip.



Compression Tamper

Uniform Tension Bolt Tightener

D. S. R. Track Layer

INTERNATIONAL STEEL

Street Exactly Like The Plan

Use Uniform Mechanical Methods and Steel Twin Ties

Uniform results in constructing paved track are what every operator wants. For *uniform* quality and results International machine methods combined with Steel Twin Ties have no counterpart in paved track construction. It is the only completely controlled, economical method of building paved track—regardless of whether the job is large or small.

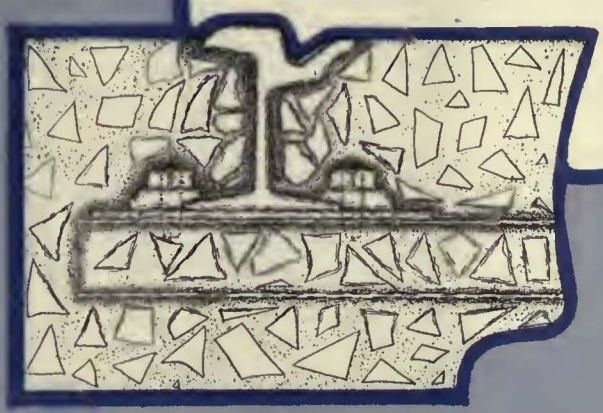
The modernized standard Steel Twin Tie has 8 plate anchors twisted into the concrete. It is furnished with the precision type rail clip that is *rolled, sawed, drilled and machined,* and with heat treated high tensile bolts.

Install these Steel Twin Ties with the four machines that comprise the International Mechanical Method —Track Layer, Bolt Tightener, Compression Tamper and the marvellous Mortar-Flow Pulsator that gives a 300% better bond between rail, tie and concrete.

Then you *know* you have track in the street exactly like the plan.

Let us demonstrate International Mechanical Track laying methods, submit prices on ties, and terms on machine equipment. Write.

Mortar-Flow" Pulsator



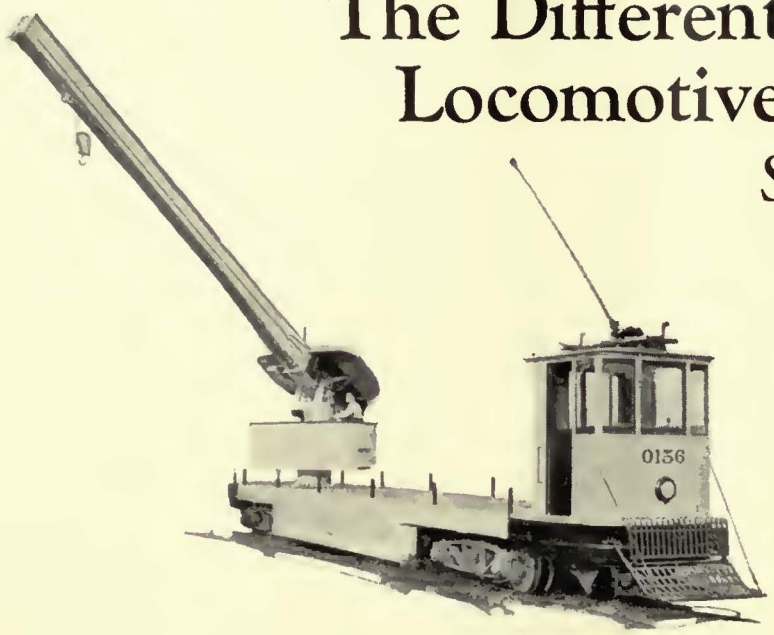
Vibrating the track structure at 5500 vibrations per minute — with the "Mortar-Flow" Pulsator — gives 300% better bond between steel, rail, and concrete.

TIE COMPANY CLEVELAND OHIO

Here's a labor saver for you!

The Differential Electric Locomotive Crane Car

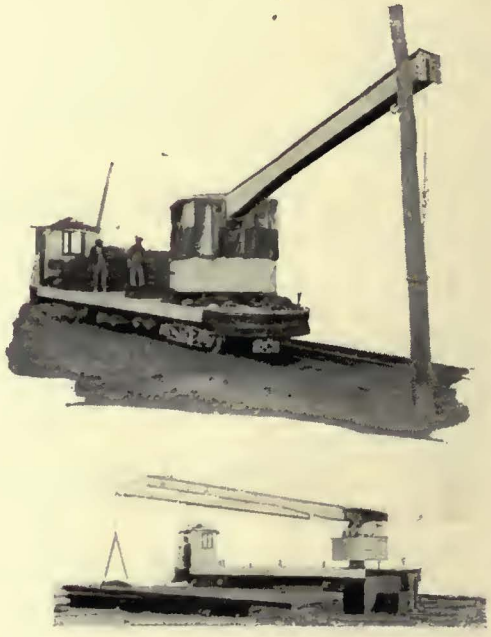
Saves Time and Labor Reduces Accidents



Capacity

5 Tons at radii up to 26 feet.

2 Tons at radii from 26 feet to 44 feet.



Economically Performs Many Operations:

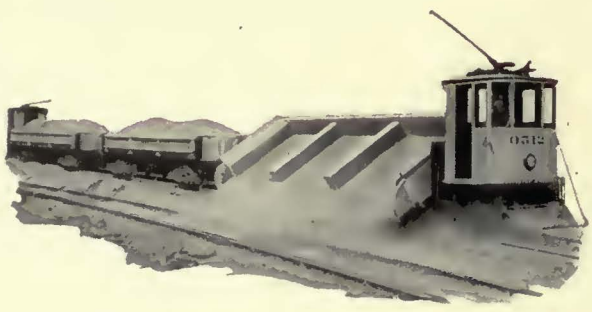
Handling rails
Handling special track work
Setting poles
Handling bridge timbers
Magnet loading
All kinds of loading and unloading operations

One Man Operation:

The crane operator sits in a revolving turret. From his seat he can conveniently and safely control the movement of the car along the track as well as control the four distinct crane movements.

Safety:

The machine is speedy but safe. It conforms to Electric Railway clearances. Never blocks traffic on adjacent tracks.



The DIFFERENTIAL METHOD

cuts construction costs

The Differential Electric Dump Car.
The Differential Body—3-way Dump
The Clark Concrete Breaker
The Differential Electric Locomotive Crane Car

Adopt the Differential Method for Better Track and Lower Costs

The DIFFERENTIAL STEEL CAR CO., Findlay, Ohio, U. S. A.

GOOD LUBRICATION

keeps these Buses young

Some of the 28 buses and trucks operated by the Charles H. Vollmer Motor Bus Lines of Amsterdam, N. Y. This fleet uses only Socony Gasoline and Aircraft Oil.

BUSES wear out in parts. Sometimes the parts become worn out through long service. All too often they wear out early because of incorrect lubrication or unsuitable lubricants.

Socony Aircraft Oil and Socony Gear Compound and Greases are keeping many buses young in New York and New England by providing their moving parts with correct lubrication.

The Charles H. Vollmer Motor Bus Lines, for instance, have found that Socony lubricants give their equipment longer life, and consequently have reduced their maintenance costs.

We believe we can show you that Socony lubricants will do the same thing for your buses.

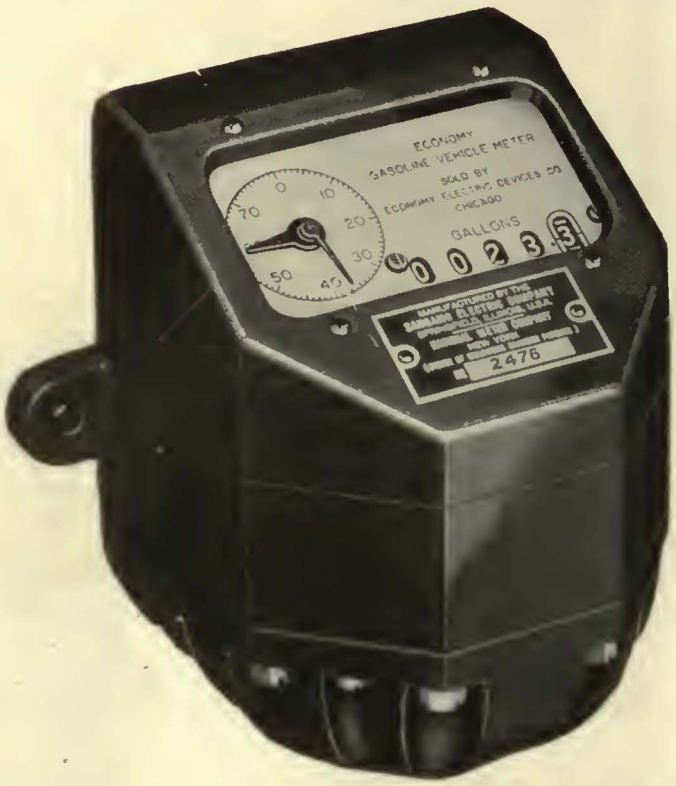
SOCONY

Gasoline · Motor Oil · Aircraft Oil

Special Gasoline plus Ethyl

STANDARD OIL COMPANY OF NEW YORK

Is a saving of
$180.00 per Bus-per year
Interesting to you?



"Tests recently completed on a line completely equipped with Economy Gasoline Meters show that a saving of 10% to 17% IN GASOLINE can be obtained through the use of these meters.

"This would mean a saving in FUEL COST of $180.00 per bus per year, or $.006 per bus mile.

"THESE METERS would pay for themselves in 3 to 6 months' time in gasoline savings."

ECONOMY GASOLINE METERS

WILL Give you individual fuel consumption records, by men, by vehicles and by routes.

WILL Tell you which drivers are operating their busses correctly.

WILL Cut your fuel costs by encouraging correct operation.

WILL Give you data on which to base educational campaigns for drivers.

WILL Indicate the condition of your equipment day by day, trip by trip.

WILL Assist your Mechanical Department to properly maintain your equipment.

WILL Cut your maintainance costs by indicating defective equipment.

WILL Enable you to determine proper carburetor adjustment.

WILL Assist you in estimating the merits of various auxiliary devices.

WILL Serve as a daily check upon the quality of your gasoline.

WILL Enable you to fit most efficient vehicle to proper service.

WILL Help you to determine most efficient schedules.

WILL Indicate amount of fuel withdrawn from tank for power.

WILL Eliminate waste of gasoline by overflowing tank when refilling.

WILL *Give you an accurate measure of your fuel costs by men, by routes, by busses, by trips.*

Let us send you the details of this new device and how it works.

Economy Electric Devices Company

37 W. VAN BUREN ST., CHICAGO

Sangamo Economy Watthour Meters
Peter Smith Heaters

Haskelite and Plymetl
Peter Smith Reverse Flow Car Ventilating System

Lang Bus Bodies
Economy Gasoline Vehicle Meters

NATIONAL
SHELBY
TROLLEY POLES

Minimum weight with maximum strength

TO keep daily service at the highest peak of efficiency means the elimination of delays or traffic tie-ups frequently caused by trolley poles failing to hold up in service. Reliable poles, therefore, are a good investment. Their selection should be based on design and tests that prove their fitness for the character of service in which they will be used.

NATIONAL-SHELBY Poles are designed with sufficient strength to meet all service requirements and yet not be of excessive weight. A special form of reinforcement at the proper place gives the pole great strength while the grade of steel used and a special heat treatment after drawing gives a high elastic limit and assures long life and satisfactory service.

In addition, every NATIONAL-SHELBY Trolley Pole is individually tested before it leaves the mill—a form of test that approximates actual service conditions. This type of test is especially important in that it minimizes the possibility of any defective pole being installed—thereby helping to cut the cost of trolley pole service before it begins. A description of this test and complete information about these poles will be sent on request.

PHONO-ELECTRIC

PHONO-HI-STRENGTH

PHONO-HI-CONDUCTIVITY

OF particular significance is the appointment of General Cable Corporation by the Bridgeport Brass Company as its sole and exclusive agent in the United States to draw wire from Phono-Alloys and to sell such wire and stranded cable.

For, in the addition of bronze Phono-Alloys to its complete line of electric wire and cable products, General Cable Corporation takes a forward step in broadening its scope of service to the entire electrical industry. The appointment is truly indicative of our earnest desire to provide a complete, dependable source of supply for all types of electrical wires and cables—and thus to be able to weigh our customers' requirements with open minds, uninfluenced by manufacturing limitations. The soundness of this policy and the benefits derived from it by all wire and cable users will, we believe, be quickly realized by the whole industry.

Adequate manufacturing facilities and a large sales and engineering organization, ably represented in the principal cities of the United States, are now available to all users of Phono-Alloys.

Although Bridgeport Brass Company will continue the manufacture and sale of this material, wires and cables manufactured from Phono-Electric, Phono-Hi-Strength, and Phono-Hi-Conductivity alloys will henceforth be obtainable through all of the divisions of General Cable Corporation.

STANDARD UNDERGROUND CABLE COMPANY

DIVISION OF GENERAL CABLE CORPORATION

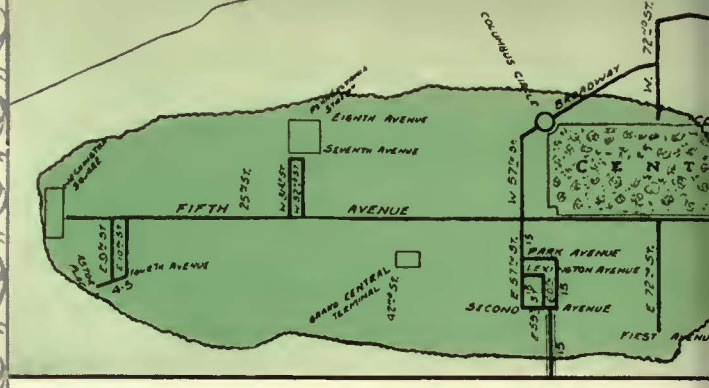
PERTH AMBOY, NEW JERSEY

How the Old Town Has Changed

HERE is Fifth Avenue at 34th Street in 1898. The horse-drawn stages originally installed in 1885 "to prevent an invasion of the Avenue by horse cars" long ago made way for "America's first fleet of gasoline propelled coaches, imported from Europe." These too are gone. Now Yellow Coaches serve Fifth Avenue . . . *the most famous thoroughfare in American history and probably the most severe city-service route in this country.*

1885 1930

Easter on the Avenue at 50th Street in 1900. There was no annoying automobile competition in these gay days—but just look at the 'ansoms.



From Washington Square to 72nd Street is the most congested three miles of bus route in America.

The first buses to run on Fifth Avenue were imported from Europe.

The Most Famous—*and Difficult* City-Service Route in America

The history of bus operation in America began 45 years ago in New York—on Fifth Avenue—known in pioneer times as "The Middle Road."

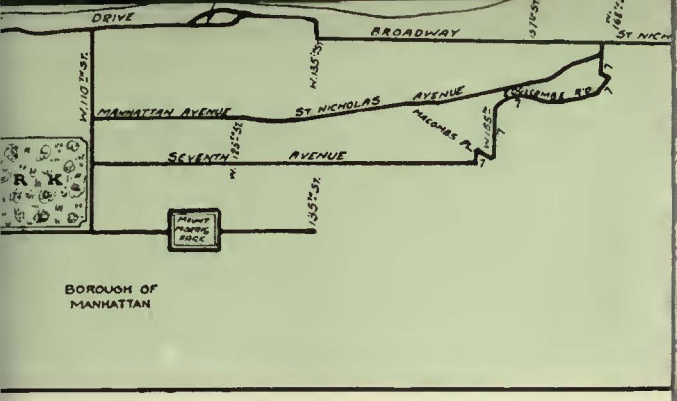
Its forebear was the horse-drawn stage. The Fifth Avenue Transportation Company, Limited, was organized in 1885 to operate a horse-drawn stage line. The company grew. Ten years later its equipment consisted of 71 stages and 360 horses.

Then came a reorganization. History tells us that the new owners in 1899 began experimenting with "gasoline and electric propelled buses" but that "the first types utilizing a gasoline engine and an electric transmission" were found impractical.

Then came experiments conducted with a single gasoline bus—the DeDion Bouton imported from Europe. Fourteen others were ordered in 1907. Two months later the horse equipment was sold at auction. The fleet of buses grew steadily. Motor coach operation on Fifth Avenue had come to stay.

Then came the world war. Coaches could no longer

Fifth Avenue Coach buys 100 more



The latest double deck Yellow Coach of the type just ordered.

Fifth Avenue at 44th Street today. For three miles it's like this —the most congested stretch of route in America

be imported and the company was forced to manufacture their own equipment to meet their specialized requirements. Then came Yellow Coach—one of America's first bus manufacturers—with equipment specially designed and developed for large capacity passenger transportation. Fifth Avenue has been standardizing on Yellow ever since.

Today the Fifth Avenue Coach Company operates a maximum total of 440 buses—with 100 more Yellows now on order to replace equipment of older type.

There is no more severe or grueling test of equipment than double deck operation on Fifth Avenue. Here, along this world-famous artery, buses operate over a longer congested route than is found in any motor coach operation in America. Congestion! From Washington Square to 72nd Street a dense packed mass of vehicles and surging humanity stretches solidly ahead for three grueling miles. Yet under the scheduled headway *a bus every 16½ seconds* must work its way through.

The drag and strain on machinery is tremendous. During practically all hours of the day the traffic is packed, jammed. When it moves it moves as a unit. Frequent traffic stops pile up the buses. Equipment crawls, stops, starts, stops and starts again. One mile—two—three—there is no relief in this congested area.

Fifth Avenue Coach Company operates 32.23 miles of route.

11,385,574 revenue bus miles were piled up during the year ending June 30, 1929.

66,236,312 revenue and transfer passengers were carried.

618,181,395 active seat miles were furnished.

Yellow Coaches

Interesting Facts

The Fifth Avenue Coach Company is the pioneer bus operator of America.

The company obtained its charter in 1885 and operated horse stages on Fifth Avenue until 1907.

The first experiments with gasoline buses in America were conducted on Fifth Avenue by this company.

The first successful gasoline bus was imported from Europe in 1906.

The company has an operating fleet of 440 coaches—practically all double deck equipment—and has just placed an order for 100 additional Yellow Chassis.

Year Ending June, 1929

Passengers carried	66,236,312
Miles of route	32.23
Revenue bus miles	11,385,574
Drivers and conductors	1,300
Garages and shops	4

1,300 drivers and conductors are on the payroll and four main and service garages keep equipment in good condition.

Traffic conditions on Fifth Avenue hold no place for motor coaches that cannot stand the gaff. These big, double deck coaches *must* keep moving for a breakdown would jam traffic instantly.

The Company' years of experience along this ruthless proving ground, proves that Yellow Coaches successfully meet the abnormal conditions encountered.

Because of their performance, 100 "Type Z" Yellow chassis, for double deck bodies, have just been ordered by this pioneer operator and will soon go into service on the most famous, *and difficult,* city-service route in America — *Fifth Avenue in New York.*

GENERAL MOTORS TRUCK COMPANY, PONTIAC, MICH.

Subsidiary of Yellow Truck & Coach Mfg. Company

Through the McGRAW-HILL PUBLICATIONS you can tell your sales story to this broad sweep of industry and business:

Economy in distribution is a matter of intelligent weighing of markets and intensive specialization in those that are found to be most profitable. The McGraw-Hill publishing program offers not only a wide and effective advertising coverage of industry and business but facilities and experienced help in establishing efficient selling programs to which advertising, to be successful and economical, must be geared.

AMERICAN MACHINIST—A weekly publication reaching those executives of the metal-working industries who are responsible for management, production and plant operation. Circulation 17,512.**

PRODUCT ENGINEERING—A new monthly publication reaching the executives of the metal-working industries who are directly responsible for the planning of the product from the viewpoint of salability, best service in use and economy in manufacture. Over 8,000 copies of this publication are distributed monthly to the executives in charge of research, design, specification and field investigation.[1]

THE BUSINESS WEEK—A new journal of business news and interpretation. Fast, complete coverage of the news. Published weekly on a newspaper schedule. Fifteen editors—all business specialists—provide 75,000 major executives with the news they need and tell them what it means.*

SYSTEM—A monthly journal devoted to modern business management. Covers the managerial executives in large and medium-sized businesses. Circulation 70,000.

FACTORY & INDUSTRIAL MANAGEMENT—A monthly publication serving the men responsible for production and plant management policies in all major industries. A general industrial executive journal. Circulation more than 33,000.**

INDUSTRIAL ENGINEERING—A monthly publication serving the plant engineering department throughout industry on the selection, installation and maintenance of mechanical and electrical equipment, and maintenance of plant structures. Circulation 15,000.**

ENGINEERING NEWS-RECORD—A weekly publication reaching the engineering executives and contractors of the civil engineering and construction industry. Editorially covers planning, designing, construction and maintenance of buildings, bridges, highways, railroads, waterworks, irrigation, drainage and sewerage systems, etc. Circulation 30,000.**

CONSTRUCTION METHODS—A monthly pictorial of field practice and equipment read by the field-minded construction men. Covers construction, maintenance and material handling methods for general construction, highways, buildings, industrial plants, public works and utilities. Circulation 32,000.**

POWER—A weekly publication reaching those in responsible charge of power generation and attendant services in all industries. Editorially covers the functions of executive control, installation, operation, maintenance and application of power wherever it is employed. Circulation 27,535.**

AVIATION—A weekly publication serving all those engaged or actively interested in the development of the aeronautical industries . . . 20,332 copies are subscribed to by the business men of the aeronautical industries. The oldest American aeronautical magazine.*

ELECTRIC RAILWAY JOURNAL—A monthly publication reaching the managing and operating executives and engineers of city and inter-city transportation companies—electrified railways (surface, subway, elevated) and affiliated bus operations—in the U. S., Canada and throughout the World. Circulation nearly 6,000.**

CHEMICAL & METALLURGICAL ENGINEERING—A monthly publication serving the chemical engineering or process industries—a group of approximately 20 industries closely related because of common production processes. Circulation more than 13,000.**

FOOD INDUSTRIES—A monthly publication serving the manufacturing and processing of food products. Written for the production executives and technologists of the food manufacturing industries. Circulation 10,000.

COAL AGE—A monthly engineering journal reaching the executives and operating heads of the bituminous and anthracite mining industry. Devoted editorially to operating, technical and business problems. Circulation 9,383.**

ENGINEERING AND MINING JOURNAL—A national semi-monthly publication read by the executives and operating heads responsible for mining, milling, smelting and refining metals and non-metallic minerals in the United States and possessions. Editorially covers operating, technical and business problems of the industry. Circulation 7,000, concentrated in the United States and its possessions.

ENGINEERING AND MINING WORLD—An international monthly publication read by the executives and operating heads of 3,000 mining enterprises *outside* the United States and its possessions. Editorially covers operating, technical and business problems connected with mining, milling, smelting and refining of metals and non-metallic minerals. Circulation 6,300 (outside U. S. A. and possessions).

E. & M. J. METAL AND MINERAL MARKETS—A weekly publication read by metal and mineral dealers and brokers, and the major industrial metal consumers, also by the sales executives of mineral producing companies. Editorially covers metal and mineral market trends and current prices of metals and minerals. Circulation 1,500.

ELECTRICAL WORLD—A weekly publication reaching executives and engineers of central stations and electrical manufacturers, electrical engineers of industrial manufacturers, consulting engineers, etc. Circulation more than 18,500.**

ELECTRICAL MERCHANDISING—A monthly publication reaching appliance departments of central stations, sales executives of electrical appliance manufacturers, wholesalers and dealers of all classes handling electrical merchandise in volume. Circulation more than 17,000.**

RADIO RETAILING—A monthly publication serving retailers, wholesalers and manufacturers—radio, music, hardware, sport, department stores, etc. The only ABC-ABP paper in the radio or music trade field. Circulation more than 26,000.**

ELECTRICAL WEST—A monthly publication serving central station executives, appliance dealers, jobbers, contractors and contractor-dealers, in the 11 Western and Pacific Coast states. Circulation nearly 6,000.**

BUS TRANSPORTATION—A monthly publication read by the managing, operating and maintenance executives and engineers of common carrier bus operating companies throughout the United States. Circulation nearly 10,000.**

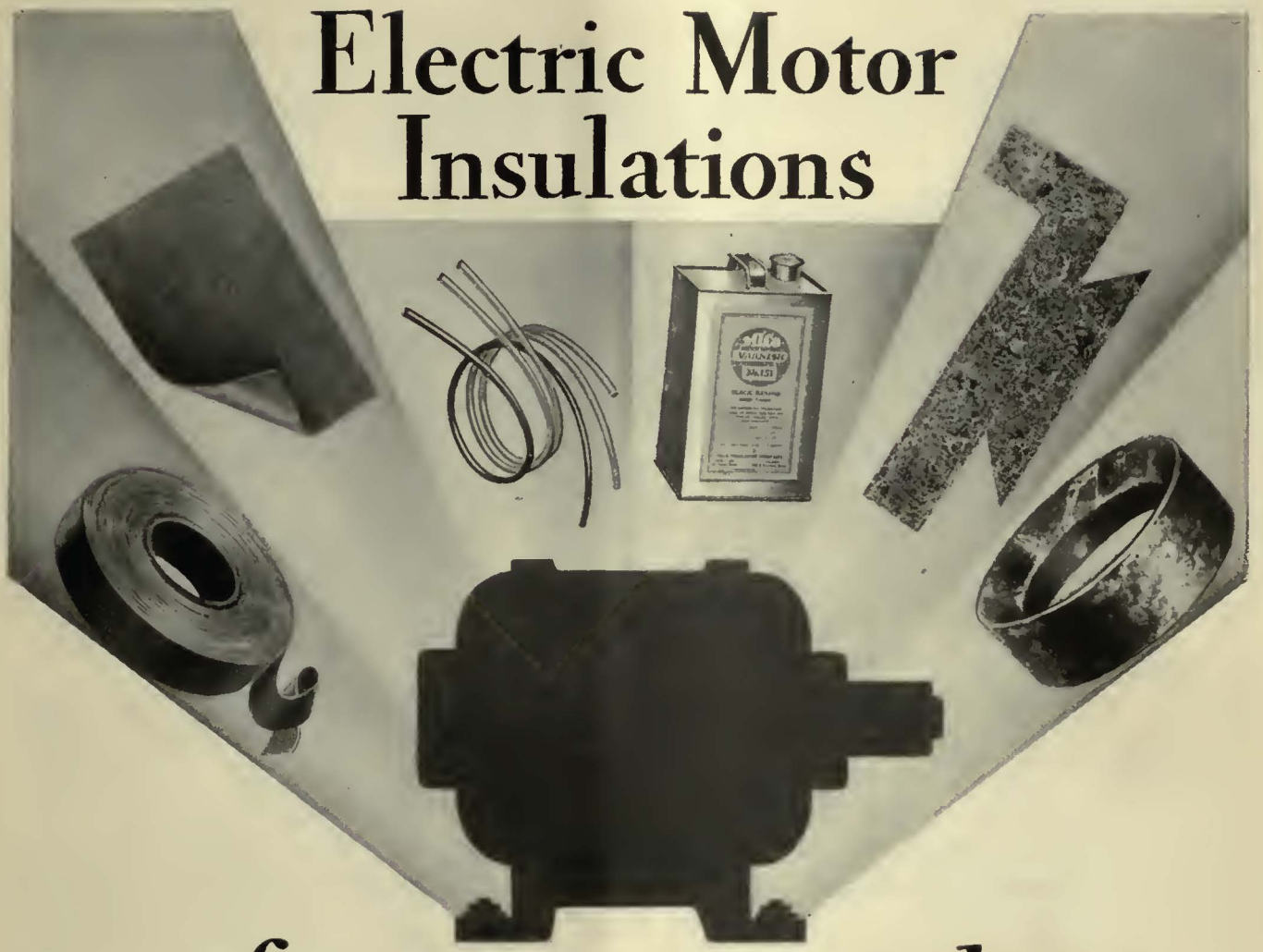
TEXTILE WORLD—A weekly publication serving all branches of textile manufacturing—cotton, wool, silk and rayon. Edited for the administrative and production executives. One of the earliest industrial publications (established 1868) and the world's accepted textile authority. Circulation nearly 9,000.**

** Member of Audit Bureau of Circulations and Associated Business Papers
* Member of Audit Bureau of Circulations
[1] First issue appears in January, 1930

McGRAW-HILL PUBLISHING COMPANY, INC.

NEW YORK CHICAGO PHILADELPHIA WASHINGTON
DETROIT ST. LOUIS CLEVELAND BOSTON
SAN FRANCISCO GREENVILLE LONDON

Electric Motor Insulations



...for every need

for every motor type and size!

Glance at the insulations listed at the right. There is one for every motor need from slot buttons to phase leads.

They are all performance-proved in thousands of motors of every manufacture. Their quality is unvarying, for throughout manufacture—from raw materials to finished products—continuous inspections to most rigid standards are maintained.

We offer you one source of supply for all your motor insulations and quality that is unexcelled.

MICA INSULATOR COMPANY

New York: 200 Varick Street Chicago: 542 South Dearborn Street

Works: Schenectady, N. Y. London, England

Cleveland Pittsburgh Cincinnati Birmingham Seattle San Francisco Los Angeles Toronto Montreal

Super-Micanite and Micanite

Commutator Segments Commutator, Rings, Tape.

Empire Oiled Insulations

Linotape, Cloth, Armatite, Paper, Tubing, Canvas Duck, Silk.

Mica Insulations

Varnishes, Compounds, Slot Paper, Cotton, Sleeving, Friction Tape, Rubber Tape, Twines.

PERFECT MICANITE INSULATOR REG. U.S. PAT. OFF.

Electrical INSULATION

PERFECT EMPIRE INSULATOR REG. U.S. PAT. OFF

MICA INSULATION OILED CLOTH INSULATION

This is one of a series of advertisements directed originally to advertising men in an effort to make industrial advertising more profitable to buyer and seller. It is printed in these pages as an indication to readers that McGraw-Hill publishing standards mean advertising effectiveness as well as editorial virility.

PATENTS EXPIRING!

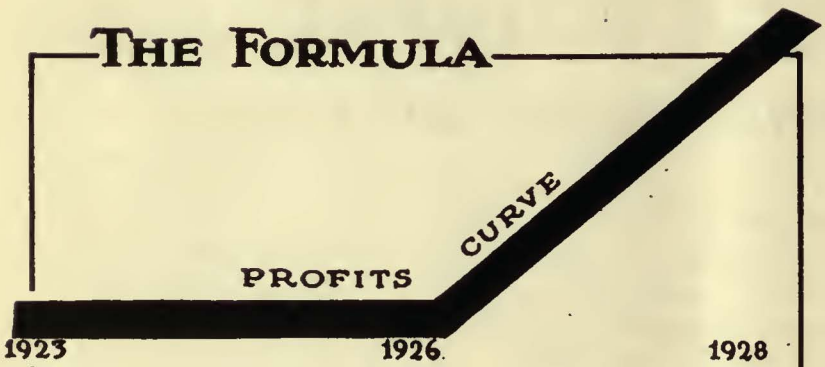
what'll we do?
what'll <u>others</u> do?

BASIC patents on a machine used extensively by a specific industry were owned by the ABC Corp.

The XYZ Co. also made the machine, along with other products, paying the ABC people a royalty for every machine sold. The XYZ Co. chose to stay in business without making a practical profit on this particular product. *Why?*

Two years or so ago the patents expired. The expected happened. Dozens of manufacturers turned to making the machine. But instead of diminishing sales for the XYZ Co., there came increased sales, pyramiding profits and leadership in the field. This leadership is being maintained today by the same formula that was used steadily for three years before industry-at-large was free to make the machine.

THE FORMULA



During this three-year period, when XYZ's profits were barely enough to pay the patent owners, XYZ advertised regularly in McGraw-Hill Publications—building recognition for the future—intrenching themselves in a strategic position for the *post-patent period*.

Pyramided effects of continous industrial advertising sent sales and profits constantly upward after patents expired. A sustained advertising program of full and double pages, with pithy, factful copy, is keeping the XYZ Co. in top place. A clear-cut victory—not so much for McGraw-Hill publications but for Industrial Advertising strategically applied.

McGRAW-HILL PUBLICATIONS

New York · Chicago · Cleveland · Detroit · Philadelphia · St. Louis
Greenville · San Francisco · Boston · London

F-15

ENGINEERS *and* CONSULTANTS

SEARCHLIGHT SECTION

EMPLOYMENT and BUSINESS OPPORTUNITIES—USED and SURPLUS NEW EQUIPMENT

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 5 cents a word, minimum $1.00 an insertion, payable in advance.

Positions Vacant and all other classifications, excepting Equipment, 10 cents a word, minimum charge $2.00.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads.

Discount of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 inch $6.00
2 to 3 inches..... 5.75 an inch
4 to 7 inches..... 5.50 an inch

Other spaces and contract rates on request.

An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

R.J.

POSITIONS VACANT

ACTIVE, ambitious young man wanted for position of street and interurban railway superintendent. Man of technical training and experience in operating responsibility desired. Must furnish references and complete statement of experience. An excellent executive opportunity with rapidly growing street and interurban railway system in the Middle West. P-192, Electric Railway Journal, 520 No. Michigan Ave., Chicago, Ill.

New "SEARCHLIGHT" Advertisements

must be received by 3 P.M., the 15th of the month to appear in the issue out the 1st of the month.

Address copy to the Searchlight Department

Electric Railway Journal

Tenth Ave. at 36th St., New York City

STREET RAILWAYS

We are in the market at all times to purchase and dismantle abandoned street railways. Highest prices paid.

M. K. FRANK
Park Row Bldg., New York

POSITIONS WANTED

ARMATURE winder well experienced with railway equipment desires change. Reference. PW-197, Electric Railway, Tenth Ave. at 36th Street, New York.

SOMEWHERE there is an electric line which handles less than carload freight and express, who are not satisfied that they are getting the volume that they deserve. Such a condition might be the result of a combination of things. A successful operator of more than twenty years in business getting, systemizing, station operations, claims and claim prevention is prepared to go into such a position and bring the revenue up to expectations and cement a genuine friendship on the part of the customer for the carrier. I can do that job. PW-196, Electric Railway Journal, Tenth Ave. at 36th St., New York.

BUSINESS OPPORTUNITY

Capital Raising

Stock and bond selling campaigns planned and executed for companies seeking development, Mergers, reorganizations and now financing by experienced dependable financial organization. Reference exchanged and booklet by request. The Brookworth Co., Inc., 110 East 42nd St., New York, N. Y.

IMMEDIATE SHIPMENT

FOUR BIRNEY CARS

in good condition. Any reasonable offer accepted.

FS-195, Electric Railway Journal
Tenth Ave. at 36th St., New York City

Agents and Representatives—

can be secured through the

SEARCHLIGHT SECTION

Responsible Agents and Representatives consult the Searchlight Section for new lines to handle.

THE PERRY, BUXTON, DOANE CO.

New and Relaying Rails

All Weights and Sections

We specialize in buying and dismantling entire Railroads, Street Railways, and all other industrial properties which have ceased operation. We furnish expert appraisals of all such properties.

May We Serve You?

THE PERRY, BUXTON, DOANE CO.

Rail Department, Philadelphia, Pa. General Department, Boston, Mass.

Pacific Sales Office—Failing Building, Portland, Oregon

Sell out to Salzberg—Railways Purchased in Entirety

FOR SALE

6—Light Weight Double Truck Passenger Cars two to four years old—excellent condition—ready for immediate shipment.

Single Truck Sweepers.
Double Truck Snow Plows.
Railway Motors.
Controllers.
Compressors.

Reasonably priced.

Let us have your requirements.

When business judgment dictates the wisdom of abandoning part or all of your electric railway equipment—don't let it rust away in idleness waiting for the chance piece-meal buyer to gradually unburden you, at big losses.

Do the one practical thing. Sell it as a unit to SALZBERG—complete with power plant, track, feeder and trolley wire system and rolling stock.

You will get FAIR dealing and the highest prices that are based solely on present day market values. Save money, time and trouble. We will do our own dismantling.

No obligation for our proposition.

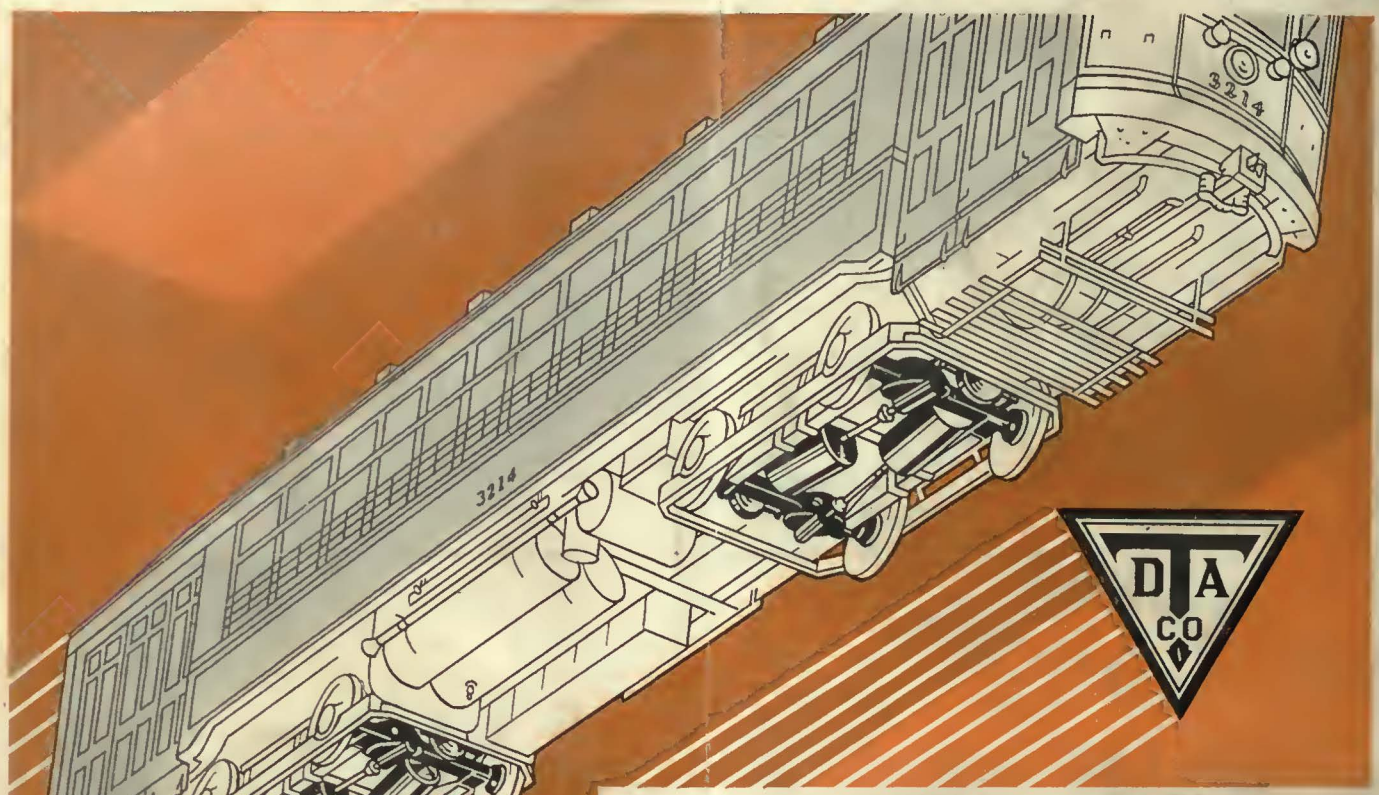
H. E. SALZBERG COMPANY, INC.

225 Broadway — Estd. 1898 — New York City, N. Y.

ALPHABETICAL INDEX

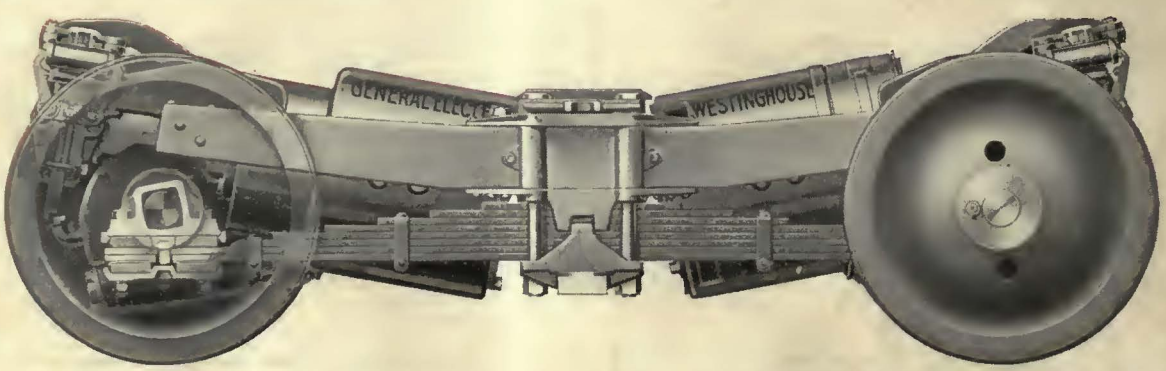
This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Electric Railway Journal* assumes no responsibility for errors or omissions.

A NEW STAR TO HITCH TO . .



...for quieter, more comfortable riding, reduced operating costs, and bigger profits.

The TIMKEN-DETROIT AXLE CO.
DETROIT, MICHIGAN



TIMKEN *Worm Drive* TRUCKS

FOR · ELECTRIC · RAILWAY · CARS