

# ELECTRIC RAILWAY JOURNAL

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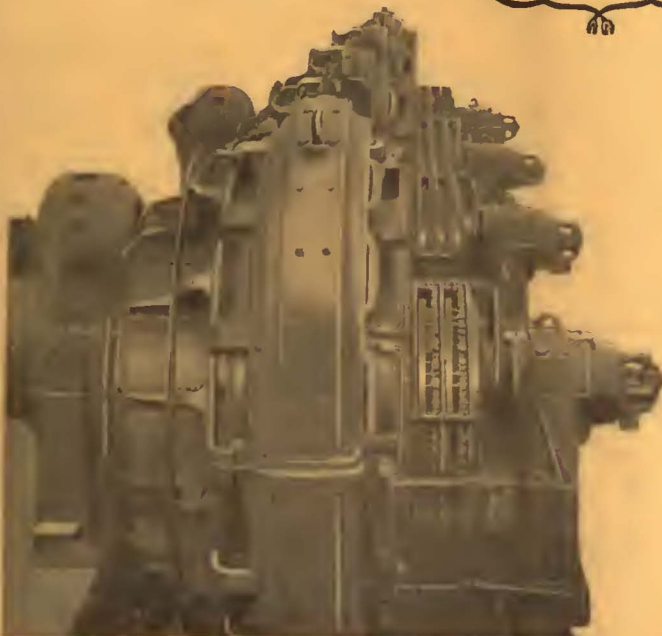
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of rotary converters and slip ring induction motors are being equipped with types S-932 and S-933 Stackpole brushes. Lower specific resistance, greater carrying capacity, exceptional long life and minimum ring wearing qualities are important factors that have made these brushes an outstanding success.

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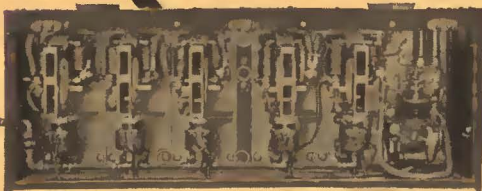
## Track Capacity

As a factor in street congestion the street car bears the same relation to the automobile, as the automobile bears to the jinricksha. It is pleasant riding in a "ricksha" if you have the space and the time.

The multiple-unit train occupies less street space, per passenger transported, than any other form of surface transportation vehicle.

Westinghouse Electric & Manufacturing Company  
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HL Switch Group for Low-Floor Cars



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# ELECTRIC RAILWAY JOURNAL

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## The Value of the Statistical Number

The following is an excerpt from the record in a recent court proceeding:

Q. Have you some figures taken from the ELECTRIC RAILWAY JOURNAL?

A. I have.

Q. What is the ELECTRIC RAILWAY JOURNAL?

A. It is a publication generally recognized as an authority on street railway operation.

Q. Have you the figures shown by the ELECTRIC RAILWAY JOURNAL of the cars ordered by city railways within the United States during the eleven years past?

A. I have.

Q. How many cars have been ordered during the past eleven years in the United States?

A. 28,417.

Q. Of that number, how many were open cars?

A. 342.

Q. Have there been any open cars ordered within the United States, according to the articles of the ELECTRIC RAILWAY JOURNAL, since 1916?

A. No.

Q. In 1916 how many cars were ordered?

A. 3,046.

Q. How many of these were open cars?

A. 131 were open cars, or 4.31 per cent.

Q. As you state, no open cars have been ordered since 1916. Is that correct?

A. That is correct.

Q. What was the total number of cars ordered in 1917?

A. 1,998.

Q. In 1918?

A. 1,842.

Q. In 1919?

A. 2,129.

Q. And the following year?

A. 2,889.

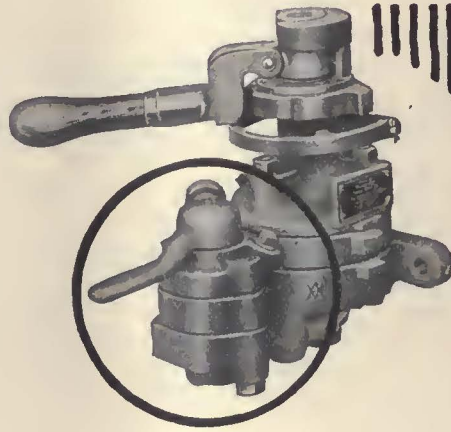
Q. And in 1921?

A. 1,059. I might add that these figures cover cars for city service only.





Showing Correct and Convenient Method of Passenger Interchange with Independent Door Control as Provided by the New SELECTOR VALVE.



The New SELECTOR VALVE as Incorporated in the Pipe Bracket of the Standard M-28 Safety Car Brake Valve.

## Solve the Door Control Problem

The use of double passageways on Safety Cars to facilitate passenger interchange is extremely desirable, but should be accompanied by independent door control. The Door Selector Valve, functioning in connection with the Standard M-28 Safety Car Brake Valve, provides this important feature, making it a simple matter to open or close either door independently, or both together, as occasion demands.

With the Selector Valve the operator is always able to regulate the flow of both streams of passengers in such manner as he finds best suited to the conditions of one-man operation.

*Write for detailed information*



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OF ST. LOUIS, MO.

*Postal and Telegraphic Address:*  
**WILMERDING, PA.**

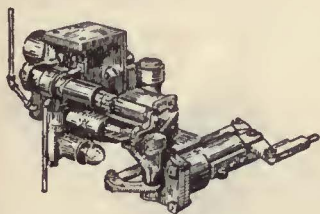
CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

We furnish the Air Brake and Safety Car Control Equipment which *makes* the Safety Car





# There Is Keen Competition for the Use of City Streets



**THE VARIABLE  
LOAD BRAKE**

The Westinghouse Variable Load Brake has been developed to solve the problem of controlling cars under widely varying load conditions. It is an attachment which may be added to any straight air or semi-automatic equipment whereby the braking force is automatically adjusted to suit the weight on the car, by regulating the brake cylinder pressure as the weight changes.

The adjusting mechanism is thrown into engagement by the opening of the car doors. While the doors are open, passengers are leaving and entering the car, and when the doors are closed again, the condition of loading will be that under which brake operation will take place for the next stop, or a slow-down, as occasion may demand.

The use of the Brake insures stopping within a uniform distance regardless of whether the car is empty or loaded.

CITY streets have become so crowded that there is constant competition between the various elements of traffic for the right of way—a natural desire on the part of each “to get there first.”

In order to meet this condition and hold their own in the general traffic movement—to maintain satisfactory schedules—street cars must be as mobile as other conveyances which use the streets.

The Variable Load Brake is an effective means of increasing car mobility. By making it practicable to use additional motors for the purpose of higher acceleration, by reducing the average time required for stopping, and by cutting down the running time between stops by allowing longer periods of peak-speed operation, a general speeding-up of service results.

*Send for Publication T-2045*

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General Office and Works: WILMERDING, PA.

# WESTINGHOUSE TRACTION BRAKES



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THERE is always a track improvement job somewhere on the road. No track ever stays perfect long and the time to repair damage is the moment that it is discovered. Track grinding is cheapest when it is continuous. Many roads keep their fleet of track grinders and welders busy all the time. They find that it pays. It saves the whole track structure, saves the rolling stock, satisfies the public and safely speeds the service.

Busy grinders are good business and good maintenance. Write us for data regarding rail welding and grinding practice on roads noted for efficient track-maintenance methods.

## Railway Trackwork Co.

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"Reciprocating" Track Grinder



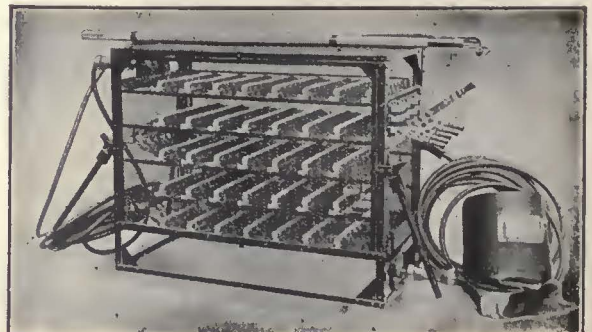
"Universal" Rotary Track Grinder



"Atlas" Rail Grinder



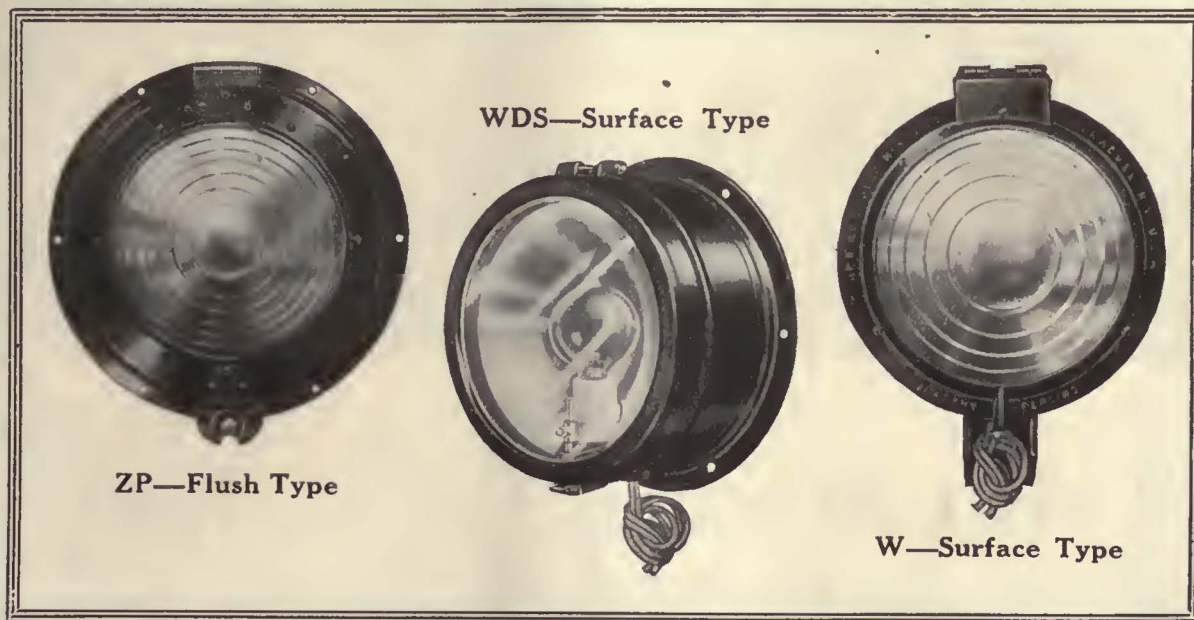
"Hercules" Rail Grinder



"Ajax" Electric Arc Welder



# Imperial Headlights—



## Three Popular City Car Types

### ZP

Made in flush mounting, pressed steel cases. Furnished with clear glass, "Noglare" glass or red, green, blue or "Noglare" semaphore lens. Reflectors, polished aluminum, nickel-plated copper or white enameled-steel. With five-sided door lock or spring-plunger catch.

### WDS

Made in flush, surface, roof and portable mountings, sheet steel or cast iron cases. Clear or "Noglare" glass in plain or grid door. Crystal or Gold Ray accurately ground glass reflectors or Sterling Ray nickel-plated copper reflector.

### W

Made in surface mounting types in cast iron cases. Clear, or "Noglare" glass or red, green, blue or "Noglare" semaphore lens, in plain or grid door. The Type W is supplied with metal reflectors like the Type ZP.

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The **Ohio**  **Brass** Co.  
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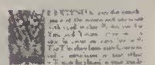
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## This Christmas Give Them *Insurance!*

**W**ITH no greater cost than that of the Christmas basket or the traditional turkey, you can give employees a lasting gift—Life Insurance. It will mean much more to your men—and to you, in increased team-work—than any passing remembrance. 73.8% of the 2,000 employees of the Public Service Company of Northern Illinois chose it above all other company gifts. It's a *unique* gift—one that cannot be duplicated. And its effects will not be gone in a week—or a year. Many concerns rate group insurance as more than a gift—as a profit-paying investment. Why not turn this Christmas into one of double good-will and profit both to you and your employees?

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**The Travelers**  
Insurance Company  
HARTFORD, CONNECTICUT





### The Days Of The 50 Cent Tie Are Gone

When you plan 1924 paved track and face the present high cost and shortage of prime quality wood ties, think of the 26 properties which made their first installation of steel twin ties in 1923.

To determine whether you can do better on cost of track with steel twin ties ask for itemized costs and track plans on Twin Tie Track.

*The*  
**INTERNATIONAL  
STEEL TIE CO.**  
Cleveland

# Steel Twin Tie Track



## Bates Poles on the New York, New Haven and Hartford Railroad

Bates standard poles are in use by the New York, New Haven and Hartford Railroad, one of the many electrification projects of which they are a part.

Simplicity of design, economical installation, permanent construction and low maintenance cost are features found in all Bates installations. Practical Engineers from the Bates Company will be glad to confer in your own office with your engineering staff.

**B**ates **E**xpanded **S**teel **T**russ **C**o.

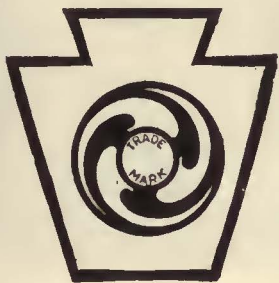
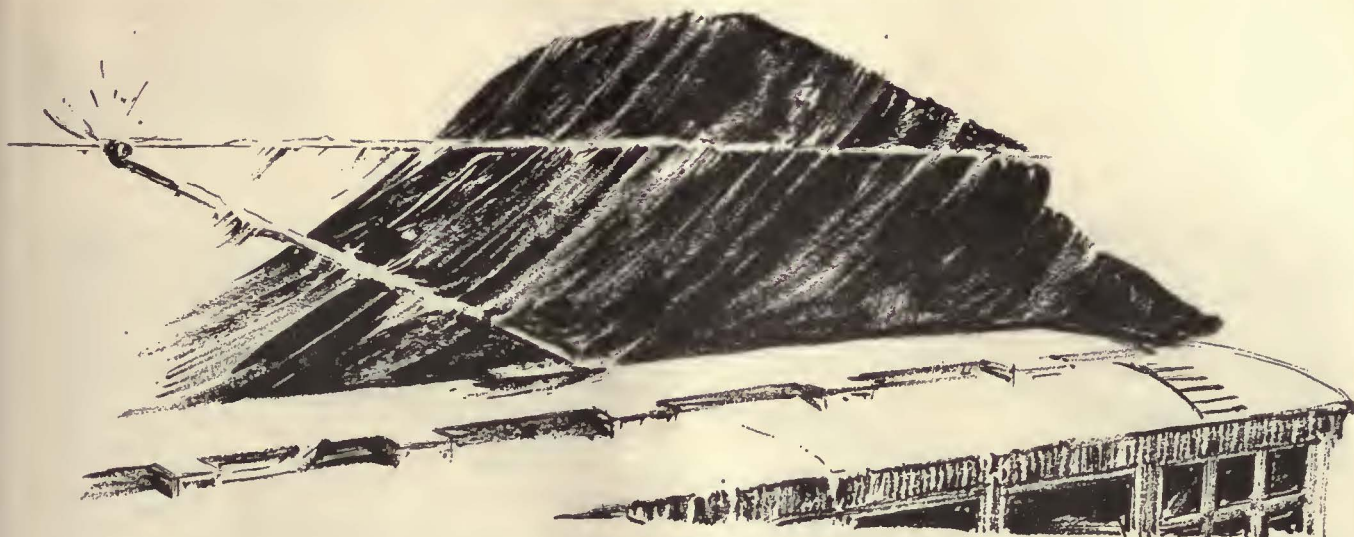
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Chicago, Ill., U. S. A.



**BATES** **ONE PIECE** **EXPANDED** **STEEL** **POLES**





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Trolley and Line  
Equipment:**

- Cornwell Sleet Cutters
- Sleet Scrapers
- Trolley Harps
- Trolley Poles
- Trolley Wheels
- Trolley Wheel Bushings
- Trolley Rope Snaps
- Samson Trolley Cord
- Keystone Overhead  
Material
- Frogs, Crossings,  
Ears, Suspensions, etc.

## Sleet days!

Ripping through clinging masses of sleet, sputtering, arcing, jumping—these Winter conditions impose an awful strain on trolley and line materials.

Take sleet cutters first, for instance. The ordinary kind will “burn up” in a couple of hours. Our “Cornwell Positive” type cutter is a different breed. Made of cast steel with a small removable brass lug for the electrical contact. This small lug is all that burns out, and it can be replaced quickly and at minimum expense. Cornwell Sleet Cutters are easily attached without changing wheel or harp.

Other Keystone trolley and line material is equally efficient. Consult the list at the left and stock up for winter wear.



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*International Ties are inspected with measuring rules by men familiar with the characteristics of timber in the South-western territory.*

## *International* Treated Ties

## The Real Significance of International Tie Service

**T**HE foundation of International Tie Service is built on the production of sound, durable ties of uniform size in strict accordance with A. R. E. A. grades.

*"Always a Standard Specification Tie"* is a slogan inseparably associated with the International Tie Organization.

The specifications are simple and not difficult to interpret—you CAN get standard specification ties if you INSIST on getting them. Rigid inspection has not been found to discourage production after the producers learn what is expected. But it is quite natural that they make small ties as long as you will take them.

If you purchase your 1924 ties through the International Tie Organization you are assured of Standard Specification Ties. They cost no more—they are merely worth more.

*Contract for your requirements now.*

**International Creosoting & Construction Co.**

General Office: Galveston, Texas

Plants: Texarkana, Texas

Beaumont, Texas

Galveston, Texas



*Always a standard specification Tie*





*This is the treadle mechanism of*  
**THE AUTOMATIC DOOR CAR**  
 Facilitates Passenger Interchange—

Without attention from the operator, this new and remarkable device opens the exit door to permit passengers to alight and closes automatically after the last one gets off. This treadle, built into the platform floor, actuates the door engine valves. Passengers cannot enter through this automatic exit door. Interlocked with brake valve so door cannot open while car is in motion.

This is an important time-saving auxiliary where larger cars are to be operated by one man. Over a year's service on some of Chicago's double truck one man cars has proved it.

**NATIONAL PNEUMATIC CO.**

Incorporated

*Originators and Manufacturers*

**Principal Office: 50 Church St., New York**

Philadelphia—Colonial Trust Bldg.

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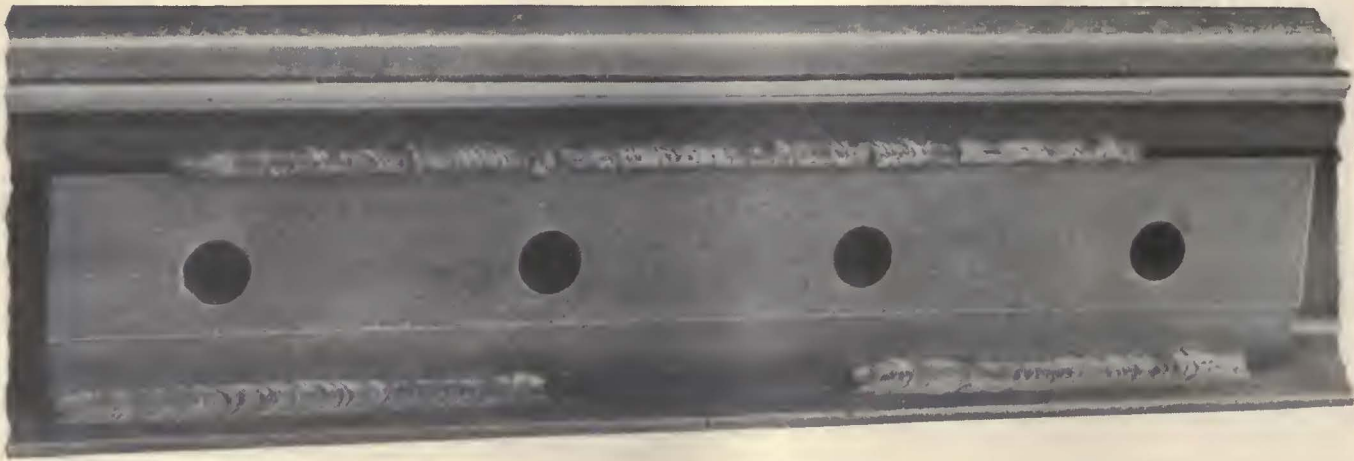
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*Manufactured in Canada by*

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## Many Important Features

UNA Joints resulted from a development based on a thorough understanding of the requirements necessary in the making of economical and durable seam-welded joints. Years of scientific research coupled with practical engineering are back of UNA Joints. Just consider the following characteristics which have appealed so strongly to many engineers.

# UNA Joints

(Patented)

1. Elimination of the gap between rail heads
2. Rail heads under compression
3. Proper mechanical structure to obtain strength
4. Correct methods of assembling joints
5. Heavy seam welds by improved welding process
6. Comparatively low welding current
7. Excellent seam metal with UNA Joint Rod
8. Staggered seam welds to distribute stresses
9. Skipping gap to relieve stresses
10. Proper grinding of joints after welding

*We will be glad to submit full information about UNA Joints and detailed recommendations for their installation on your track.*

## Rail Welding & Bonding Company, Cleveland, Ohio

*Manufacturers of*

## UNA Bonds

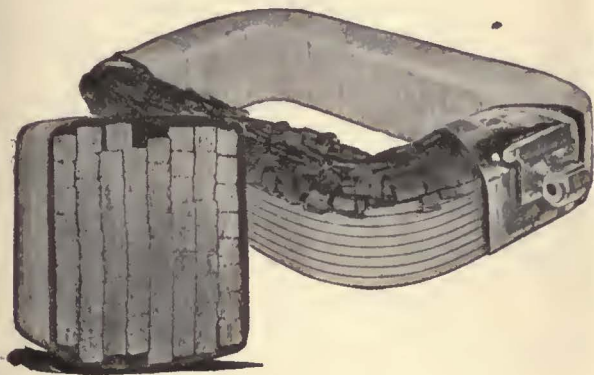


# CUT OFF DEAD WEIGHT



## USE ALUMINUM FIELD COILS

*and save from  
400 to 1500 pounds  
on every car*



### *Advantages of Aluminum Field Coils—*

- Permanent insulation.
- Moisture and heat resisting.
- Uniform distribution of heat.
- Quick conduction of heat.
- 50% to 60% weight reduction.
- Brass spools not needed on large coils.
- Less chafing due to lighter weight.
- Less terminal trouble.
- Longer life—less renewals.

The characteristic relations between the cross sectional areas and corresponding resistances of aluminum and copper, and the per cent saving in weight are such that for the Aluminum Coil resistance to equal the copper resistance, the cross sectional area of the Aluminum conductor must be increased 59%—and when increased by that amount the **SAVING IN WEIGHT IS 52%**. The foregoing is based on the Aluminum Coils having the correct number of turns.

Aluminum field coils have been in operation in Europe for fifteen years and more than 60 American Railways are now using them.

Let us quote you prices and answer detailed questions.

## Economy Electric Devices Company

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Detroit Railway Supply Co.  
Alfred Collyer & Co., Montreal, Quebec



These are the actual wire wear readings over a 6-year period with MILLER TROLLEY SHOES



WIRE TEST READINGS

Pole No.	6/7/16	9/25/17	12/27/18	4/9/20	5/29/23
235		.477	.469		.445
		.474	.473		.451
267		.481	.474		.472
267-268		.482	.478		.474
336	.487	.481	.475		.459
338	.487	.479	.465		.420
438	Curve	.467	.453		.411
438	Curve	.467	.450		.402
440	Curve	.463	.451		.377
446	Curve	.472	.466		.390
482		.476	.472		.471
490	.477		.473		.465
491		.474	.472		.465
502		.475	.475		.465
505		.473	.469		.463
531	Curve	.476	.477		.468
558		.474	.474		.467
631	.479	.475			.464
634	.479	.477			.468
650		.476	.475		.470
659		.478			.469
662		.480			.471
726		.464	.464		.465
770		.477	.472		.468
788		.476	.473		.467
818		.477			.470
858		.476	.474		.467
901		.475	.474		.465
968		.476	.469		.455
984		.477	.471		.455
997	Curve	.477	.474		.470
1013	Curve	.483	.480		.472
1042		.479	.477		.472
1051		.479	.476		.471
1059	Curve	.483	.482		.477
1084		.478	.475		.469
1123	Curve	.483	.482		.479
1123		.482	.482		.472
1164		.479	.479		.478
1183	Curve	.482	.475		.469
1184	Curve	.483	.478		.470
1190		.482	.477		.472
1204		.469	.450		.334
1208		.478	.478		.471
1211		.479	.477		.471
1309		.478		.477	.471
1310		.480		.474	.466
1316		.481		.475	.469

—and what some other roads say!

Ephrata, Lebanon Traction Co.—  
“Our experience has been that trolley shoes do not wear the wire as fast as wheels.”

Chicago, No. Shore & Milw. R.R.—  
“... condition found on inspection shows conclusively that there is less wear on the trolley wire due to the use of sliding contact than there is due to wheels.”

Interstate Public Service Co.—  
“They do not wear the trolley wire faster.”

On the Portland Lewiston Interurban

Less than .003 of an inch wear per annum is the average of the above figures with 16,000 car passes per year. This hard-drawn 4/0 copper wire will last about 2,000,000 car passes at this rate. Will your trolley wire show any longer life with trolley wheels?

The Miller Trolley Shoe sliding contact gives to the wire a smooth glass-like surface, which resists wear and eliminates arcing. Moreover, less trolley pressure is required to hold the contactor on the wire.

Have you tested this out?

Miller Trolley Shoe Company  
295 Columbia Road, Boston-21, Mass.

Western Representative:  
Economy Electric Devices Co., 1590 Old Colony Bldg., Chicago, Ill.

MILLER TROLLEY SHOES





# Electric Railway Lubrication

## Galena Air Compressor Oil

The intense, dry heat of compression associated with the lubrication of air compressor cylinders makes it an entirely different proposition from the conditions identified with steam cylinder lubrication. The use of unsuitable oils will result in tarry and carbon deposits forming on cylinder valves and passages, interfering with the efficient operation of the compressor.

Of the many grades of oil marketed for this service, many are unsuitable for the simple reason that they lack the elements necessary to withstand high temperatures, and instead of atomizing readily, bake and carbonize. Aside from the danger to the machine itself, the "body" of the oil is reduced and there is a large loss through evaporation—passing off in vapor.

Like all lubricants bearing the "Galena" brand, Galena Air Compressor Oil is of highest quality. The crude from which it is produced was selected for its superior qualifications for the purpose, and is not contaminated by being run with other grades. This pure mineral oil is refined and treated in accordance with specifications that insure a finished product exactly suited to compressor lubrication, furnishing adequate protection to the cylinder walls. A durable body that holds compression, and a lower evaporation—features that contribute greatly to economical service.



### Galena-Signal Oil Company

New York

Franklin, Pa.

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New York, Saturday, December 8, 1923

# Electric Railway Journal

*Consolidation of Street Railway Journal and Electric Railway Review*

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HENRY W. BLAKE and HARRY L. BROWN, *Editors*



## The Editorial of the Day

“A PLAN (for the reduction of taxes) has been presented in detail in a statement by the Secretary of the Treasury which has my unqualified approval. . . . Diminishing charges against moderate incomes from investment will afford immense relief, while a revision of the surtaxes will not only provide additional money for capital investment, thus stimulating industry and employing more labor, but will not greatly reduce the revenue from that source, and may in the future actually increase it.

“Being opposed to war taxes in time of peace, I am not in favor of excess-profits taxes. A very great service could be rendered through immediate enactment of legislation relieving the people of some of the burden of taxation. . . .

“The taxes of the nation must be reduced as much as prudence will permit, and expenditures must be reduced accordingly. High taxes reach everywhere and burden everybody. They bear most heavily upon the poor. They diminish industry and commerce. They make agriculture unprofitable. They are a charge on every necessary of life. Of all services which Congress can render to the country, I have no hesitation in declaring this one to be paramount. To neglect it, to postpone it, to obstruct it by unsound proposals, is to become unworthy of public confidence and untrue to public trust. The country wants this measure to have the right of way over all others.

“Another reform which is urgent in our fiscal system is the abolition of the right to issue tax-exempt securities. The existing system not only permits a large amount of the wealth of the nation to escape its just burden but acts as a continual stimulant to municipal extravagance. This should be prohibited by constitutional amendment. All the wealth of the nation ought to contribute its fair share to the expenses of the nation.”—THE PRESIDENT.

Shall we not actively support this program?

## Valuation Differences in Terms of Fares or Economies

IT FREQUENTLY occurs that municipal authorities and railway officials are unable to agree on a valuation of the property for rate-making purposes, and all progress of a managerial nature is blocked pending settlement. The question is raised whether this failure to come to a settlement figure is not often quite unjustified in the light of what the difference would mean in terms of increased rate of fare, from the standpoint of the city, or as measured in terms of economies or better earnings that may be held in abeyance, from the standpoint of the company.

For example, in one city recently the company held out persistently for a value about \$1,500,000 higher than the city would concede, the city's figure being about \$6,500,000 total. Yet with this mooted valuation settled, the company would be in a position to make operating improvements, as recommended by an outside expert, resulting in more than \$500,000 increase in the net, annually. This increase alone would carry at 7 per cent a capitalization of \$7,000,000—as much as the entire value of the property. Under such circumstances, a million or so difference between the value asked and the value obtainable would hardly seem worthy of being permitted to delay the possible improvements.

Similarly, the importance of the controversial difference dwindles in many cases when translated into the rate of fare required to support the higher figure of value. A difference which in itself seems like a huge sum may make a fraction of a cent too small for cognizance in the rate of fare especially on a large system—an amount which might easily be wiped out (or doubled) in a year of good (or bad) operation.

This paper is strongly of the opinion that if about 25 per cent of what is spent on valuation studies and litigation were spent instead in operating studies, the industry would make much more rapid progress. What is needed is more talent directed to transportation efficiency, and greater use of the yardstick method and common sense valuation procedure.

## Are Improved Transportation Conditions Approaching in New York?

IF THE early future is to see a greater spirit of cooperation toward the New York City traction properties by the present city administration it will be welcome news for every one, particularly the traveling public. That such a condition is among the possibilities is indicated by recent remarks of acting Mayor Hulbert to the effect that the City Board of Estimate is now “working with the Transit Commission in harmonious co-operation for some real results in the way of a solution of the traffic problem.” After all, results are what count in the long run in political as well as in business circles. Ability to scold may bring popularity for a time, but even picturesque invective gets monotonous. Unless a politician can get the people what they want his power is sure to wane.

Just at present the people of New York need more and better transportation more than almost anything else, and the only way it can be had to any material degree is through the existing transportation companies. It is wonderful what they have been able to do in the circumstances, but it is obvious that with fewer obstructions and better credit they could accomplish much more. Not all of the difficulties have come, of course, from the city government, but with that sympathetic and anxious



to help, a better condition is certainly possible. New subways are needed, but while these are in the building it is practicable to increase the present transportation facilities, both rapid transit and surface. With the Brooklyn system reorganized and the reorganization of the New York Railways nearing completion, all of the companies are in a position to do their share in supplying the public need.

Of course the question of return is fundamental. Without an adequate fare all the companies will be greatly handicapped. Nevertheless it should be remembered that while the carfare in New York nominally is 5 cents, virtually it is more than this on both surface and rapid transit lines. On the rapid transit lines passengers get benefit from the fact that no interest is being paid on the city investment under the dual contract, while on the surface lines the average length of ride for a single fare has been reduced by the dissolution of holding companies and the consequent charge of an extra fare, and also by the 2-cent transfer charge. It should also be remembered that the surface lines do not have to carry the long distance riders, as in most other cities, as these go to the rapid transit lines. Perhaps the greatest handicap of the surface lines is slow speed, caused by street congestion, because their average receipts per car-mile compare favorably in amount with those of surface lines in other cities. Here is one way in which the city can help through the passage of more stringent anti-parking ordinances.

If the time has come when the New York City fathers are beginning to realize that a constructive transportation policy is good politics, the public has much to be thankful for.

#### A Billion Passengers on the Buses

REFERRING to an editorial in last week's issue of this paper, several readers have promptly called attention to the fact that to say buses in 1922 carried only 11,000,000 passengers was wrong—and it was. The figure quoted from the compilation of the Census Bureau was for passengers carried by buses operated by electric railways only—a qualification which was not noted. For all buses, it is probable, based on rough estimates, as no accurate figures are compiled, that the total passengers carried in 1923 will be up toward a billion—something less than 8 per cent of the number of revenue passengers carried on the electric railways of the country during the twelve months ended June 30, 1922.

While this is very different from the obviously erroneous figure used last week, nevertheless, by correcting figures all the way through, the editorial might still be permitted to stand. Its object was to point out the relatively very much greater importance of the electric railway to the public than the bus. The correct figures still show this, though they give to the bus industry a far better position of importance.

It was not the desire of this paper to belittle the bus, for readers know how the JOURNAL has urged its use in its place by the electric railways. But it was thought worth while to show the relative positions of bus and railway. The bus, being new and introducing many new problems and much speculation as to the future of transportation, is really talked of and read of, rather naturally, out of proportion to its present importance as measured by the traffic handled.

#### Customer Ownership of Utility Securities— From the Customer's Standpoint

THE advantages of customer ownership of utility securities—from the utility standpoint—have been set forth at various utility conventions during the last few years. Naturally, they present the subject from the standpoint of the utility, particularly the improved public relations which it is hoped will be secured by the plan. The position is put forth that if a man—or woman—becomes a security holder in the local utility, the latter thereby obtains a friend, whose sympathy can be counted upon and whose self-interest will encourage him to defend the company against unreasonable demands and unjust attacks. Broadly speaking, this is the main argument put forward for the plan from the utility side. It is interesting to read in the last issue of *The Magazine of Wall Street* an article which brings out other phases of the subject, particularly from the customer's point of view. This perhaps is a phase not often considered.

The magazine article expresses approval of the plan, where the utility is fundamentally a sound one and the stock is worth the amount charged for it. In the first place, it gives opportunity to the local investor to put limited sums in high grade securities of a concern in his home town where he can watch his money, at least to some extent. In this way it will help to counteract the fake-security salesman, educate the community up to the exercise of judgment in the investment field and thus be of constructive benefit to the country as a whole. Referring to this advantage, the paper says: "If consumer financing had nothing whatever to commend it beyond the single capacity toward interesting the general public in high grade, rather than low grade securities, this feature alone would more than justify it and seal it with the stamp of universal approval."

The magazine points out, however, that customer financing doubles the company's responsibility to its customers. It is responsible to them not only for service, but becomes, in effect, a trustee of their invested funds. This emphasizes the need of keeping faith with the customer security holder, giving him a voice in the company councils and letting him know from time to time the exact financial condition of the company. The fact that by his dividends he can pay in whole or in part for his service does not discharge all of the debt which the company owes to the customer who purchases its stock. He could do that by investing the same amount of money in any responsible concern, paying equal dividends.

This trustee responsibility rests upon any company which actively exploits its securities, especially toward those who may be induced to become purchasers to an extent out of proportion to their means. Such holders are in a different position than business men who are accustomed to occasional losses, and the utility must guard very zealously its ability always to pay the promised dividends, lest there come a kind of public relations not sought.

When the principles recommended by D. L. Turner, page 963, for financing rapid transit are accepted, we may look for much needed new construction. His allotment of the cost would be fair and not burdensome to any one, in the light of the return on the individual investment, and it would enable such service to pay its own way on a fare comparable with street railway fares.



# Proposed Plan for Financing Detroit Rapid Transit Lines

**Engineer's Report Favors Assessment of Construction Costs Against Taxpayers and Benefited Property Owners—Equipment Cost Only, or One-third of the Total, to Be Financed by Bond Issue—Combination Tunnel and Subway Proposed—Piecemeal Construction of Rapid Transit Has Serious Drawbacks**

A NOVEL plan for financing new rapid transit lines is the outstanding feature of the report to the Rapid Transit Commission of Detroit by Daniel L. Turner, consulting engineer, and John P. Hallihan, engineer in charge. The report, whose legal features have the approval of P. J. M. Hally, special counsel for the commission, has been transmitted to Mayor Frank E. Doremus for his consideration.

According to the commission's letter of transmittal, the report proposes a pay-as-you-go plan that spreads the cost by assessment over the benefited property and the city at large, leaving only the equipment, which is about 32 per cent of the total investment, to be provided by a bond issue. In this way a large amount of interest will be saved, and the use of bonds based upon the faith and credit of the city will be practically eliminated.

No detailed plan of routes has been presented in the report of the engineers, as they state the location of lines will depend to a considerable extent on the choice of system, which in turn will be determined by the amount of money the city is willing to make available. A combination of subway and tunnel, termed a "tunnelway" by the engineers, is recommended as the most desirable construction if the city is willing to pay the price. A short abstract of the report follows:

## A NEW METHOD OF FINANCING ESSENTIAL ON ACCOUNT OF COST.

The cost of the proposed rapid transit system for Detroit is such as to indicate at the outset that the city must find some new method of financing a rapid transit program, otherwise it will be impracticable to go forward with it. Under the circumstances, therefore, it is essential that a financial plan should be evolved before a physical plan is announced. A plan of routes can serve no useful purpose, if the money to carry it out cannot be available. In fact, making public such a plan would cause a premature speculation in real estate along the proposed routes with no justification for it whatever.

The routes of the initial rapid transit system for Detroit are dependent, to some extent, upon the type of structure. An underground system may be constructed along any street without injuring it. Elevated lines should be confined to the outlying sections of the city, but if such construction must be carried through the business center, the principal thoroughfares should be avoided and less important streets traversed.

Developing rapid transit piecemeal is very objectionable from the community standpoint. A comprehensive system of rapid transit lines is essential. There should be crosstown lines and up and down town lines articulated together by transfer stations so as to provide for a

convenient circulation and distribution of the traffic throughout the city, thus furnishing a large part of the city with a measure of rapid transit service at the outset, and thereby maintaining the equilibrium of the population distribution.

The building of a single rapid transit line at first, and then another single line, and so on, until finally a rapid transit system is produced, completely upsets the population equilibrium. The first line built acts as a magnet to the population and to business. Congestion of all kinds is produced and the line itself quickly becomes saturated with traffic. This causes an immediate demand for relief along the first line before new lines in new territory can be constructed. Traffic conditions then become so unbalanced at the start that it is difficult ever to catch up.

The initial rapid transit system must be constructed of either subways, tunnels or elevated lines, or a combination of them. Because it must traverse built-up sections of the city, other types, such as surface and depressed lines, cannot be utilized on account of the lack of a suitable right-of-way.

Subways are most popular with the public, as they do not disfigure the streets nor interfere with light, air and access to abutting property, are not open to the weather, and are conveniently accessible to passengers. Because they are shallow underground lines they cannot be constructed without taking up the street surface and rearranging the subsurface structures. Their chief disadvantage is their high cost of construction when compared with elevated lines.

Ordinarily, land tunnels must be located deep enough underground to permit their construction without disturbing the street surface, and stations are not conveniently accessible. Deep level lines have been employed chiefly in London, where the clay underlying the city is most favorable to their construction.

Except for the inaccessibility of the stations, tunnels have all the advantages of subways. If tunnel lines can be constructed as cheaply as subways and have their stations brought to the surface, there can be no difference of opinion as to their desirability, as the tunnel can be constructed with a minimum of interference with streets and with business.

Subsoil conditions in Detroit are almost ideal for tunneling, and the so-called Detroit clay permits a very low cost of construction. A type of underground line can be built that would include the desirable features of both tunnel and subway. This is the construction termed by the engineers a "tunnelway."

Tunnelways will be constructed just below the surface only at the stations, and the streets will be excavated up to the streets at such points. Between stations they will be constructed in tunnels, one for each track. This



means that interference with business during the construction period will be reduced to about 30 per cent of what it would be if a subway were built. The stations will be located at the summits of the profile, so that the trains will have the assistance of the grades in starting and stopping.

At present prices of labor and material it would not be possible to construct and operate a tunnelway system at anything like a 5-cent fare. In this connection it should be pointed out that in New York 61 per cent of the entire rapid-transit system is elevated, or some 125 miles out of 200. Even the so-called subway division of the Interborough Rapid Transit Company—a city-owned subway system—includes elevated lines to the extent of 40 per cent, and the total city-owned systems in New York have 39 per cent of all lines elevated.

In Chicago there are no subway lines. In Philadelphia the entire existing rapid-transit system consists of less than 14 miles of line, and about 85 per cent of this is elevated. In Boston the rapid-transit system, as now operated, is about 16 miles long, and 63 per cent of it is elevated.

To obtain a cheap fare, when the rider must pay the entire cost, a cheap system is necessary. To have a tunnelway system supported by the car rider a 10-cent fare, or more, would be necessary for a number of years.

#### TUNNELWAYS COST ABOUT ONE-THIRD MORE THAN ELEVATED

Until the financial plan has been decided upon and the extent of the system determined, only costs per mile of route can be given. Detroit must pay the cost of both the construction and the equipment of the system. Such costs at present prices are approximately, for an elevated system, \$3,500,000 per mile, and for a tunnelway system, \$4,700,000 per mile, including all overhead charges.

The tunnelway system consists exclusively of tunnelway lines. The elevated system is mostly elevated, but includes a minimum amount of tunnelway line through the business center. Detroit can have a tunnelway system, says the report, if it wants to pay the price. Otherwise it must accept an elevated system, with all the disadvantages that such a system means to a city.

#### RAPID TRANSIT SHOULD BE FINANCED UNDER AN ASSESSMENT PLAN

The rapid transit cost should be divided and distributed according to the three benefits derived:

The general benefit to the city at large;

The special benefit that accrues to the property in the vicinity of the lines; and

The obvious benefit to the rider.

Based upon an analysis of the financial condition of the city by the Detroit Bureau of Governmental Research, and from other information available, it is doubtful if the city can now issue bonds in excess of \$30,000,000 for all purposes, states the report. Because of the city's many needs only a very small part of this amount can be used for rapid transit purposes. Consequently, it is very plain that on the basis of the usual plan of utilizing city credit the city is in no position to embark on a rapid transit program requiring the expenditure of any substantial sum that a reasonably adequate rapid transit system would make necessary, even if the cheapest type of construction is adopted. The city cannot turn to private capital for assistance. This would require a reversal of the existing public

policy and would make it difficult to unify the old system and the new.

All the money for construction must be available for use as required during the construction period. Any financial plan to be effective must accomplish this. The total rapid transit cost of one mile of tunnelway should be distributed in accordance with the foregoing benefits as follows:

	Cost per Mile of Double-Track Tunnelway	Per Cent of Total
By at-large assessment on the city, to cover benefits derived by the city at large, for one-fourth of the permanent way cost...	\$800,000	17
By proximity assessment on the local district, to cover benefits that accrue to the property in the vicinity of the lines, for three-fourths of the permanent way cost.	2,400,000	51
By mortgage bonds, to cover the benefits to the rider, for cost of the equipment...	1,500,000	32
<b>Total</b> .....	<b>\$4,700,000</b>	<b>100</b>

The permanent way consists of the structure, tracks and stations. The equipment consists of the power stations, transmission, signals, yards, shops and cars.

For the combination of tunnelway and elevated line, the city and benefited property owners would pay for permanent way and real estate \$2,000,000 per mile, or 57 per cent of the total, while the amount raised by mortgage bonds for equipment would remain \$1,500,000, or 43 per cent of the total cost.

#### ASSESSMENT PLAN IS NOW USED FOR OTHER MUNICIPAL PROJECTS

There is nothing new in the principle of such an assessment plan. The city and benefited property pay for the streets by assessment. The sewers are paid for in the same way. In other places property benefited is also assessed to pay for the parks. And under the Ohio conservancy law the cost for works to prevent flood damages is assessed against the property protected. Assessment to pay for rapid transit does not differ in principle from any of these.

Financing a rapid transit system in this way will mean the adoption of a pay-as-you-go policy, or mean that the present generation will pay for the rapid transit facilities required now. This is as it should be. Future generations will have their rapid transit facilities to pay for in their time. Therefore as little of the cost as is possible should be passed on to the future.

The at-large assessment of the city is to be spread over the total assessed valuation of the city, including land, buildings and personal property, for one-fourth of the cost of constructing the permanent way, or for about 17 per cent of the total cost of the tunnelway, including construction and equipment. There will be no interest or sinking fund charges upon these assessment funds, because they have not been borrowed and therefore will not have to be paid back.

The assessment is to be collected in annual installments distributed equally over the seven-year construction period, and for the tunnelway system, per mile of route per year, will amount to about \$114,300.

The at-large assessment for a tunnelway project would be only about 4.73 cents per \$1,000 of total assessed valuation per year per mile of route, based on the 1923 valuation of Detroit and the inclosed and contiguous areas benefited, including Highland Park, Hamtramck and Springwells. For 10 miles of route the



amount would be 47.3 cents per \$1,000, and even for 50 miles of route the assessment would only be \$2.37 per \$1,000 per year.

This assessment is just like any other taxation, excepting that none of the funds raised by it will be used to pay interest on borrowed money, but instead, all of the funds will be converted directly into a self-supporting asset—in other words, into the city's rapid transit system, that in turn will immediately proceed to enhance the value of the property assessed.

The above figures do not include interest during construction on the permanent way cost, because under the assessment plan no money is borrowed for this purpose. If all the money for the project is raised in the usual way by bond borrowings, then these figures will be increased by \$200,000 and \$100,000 per mile, respectively. In other words the permanent way item of cost will be \$3,400,000 per mile of two-track line instead of \$3,200,000 for the tunnelway project, and \$2,100,000 per mile instead of \$2,000,000 for the combined project.

The proximity assessment on the local district is to be spread over the local districts traversed by the rapid transit lines for approximately one-half mile on each side of the lines. The assessment is to be made on the land value only in proportion to the benefits derived, and for three-fourths of the construction cost of the permanent way, or about one-half of the total cost of the project, including construction and equipment. This assessment also is to be collected in seven annual installments corresponding to the seven years of construction, and for the tunnelway system, per mile of route per year, will amount to about \$343,000.

Not all the land will be benefited alike. The benefit at the stations and along the line will be greatest. It will decrease from this maximum to a minimum at about a half-mile distance from the line on each side. Therefore, the assessments will vary in a corresponding manner with respect to the proximity of the land to the stations and line. To simplify its application the assessment will be distributed over six zones at annual rates per square foot on the land only. The same relative rates will be applied at every station, whether it is located in the center of the city or on the outskirts of the city. The assessment rates are as follows:

Approximate Zone Limits from Stations in Feet	Annual Proximity Assessment Rates, Cents per Sq.Ft.
0-250	7
250-500	5
500-1,150	3.5
1,150-1,800	2.25
1,800-2,450	1.5
2,450-2,640	1

Consider as an example that the depth of the average lot is 120 ft. Assume that the lot is located at a station, thus coming in the 7-cent rate. Then the assessment would be \$8.40 per front foot per year. If the lot were 100 ft. in depth, the assessment would be \$7, and if it were 150 ft. deep, \$10.50 per front foot per year. Again, assume the lot was located farthest away from the station, in the 1-cent zone, then the assessments would be \$1, \$1.20 and \$1.50 per front foot per year for lots 100, 120 and 150 ft. deep respectively.

Just as in the case of the proposed assessment on the city at large, there will be no interest charges against local assessments. This money will not have to be paid back to any one. The funds will be immediately converted to the city's rapid transit system and begin at once still further to enhance the value of the property that has paid the assessment.

As illustrating the local benefits that result from furnishing rapid transit two cases were cited in the report that had been analyzed in detail by the New York City Club. As soon as the New York rapid transit program was announced and construction was begun the land started to increase in value.

#### RAPID TRANSIT GREATLY ENHANCES PROPERTY VALUES

In upper Manhattan, above One Hundred and Thirty-fifth Street, for a distance of about 4.4 miles the land affected rose from a total value of \$47,306,000 in 1900, before the rapid transit line was constructed, to about \$116,608,000 in 1907 after operation was under way. This represents an increase of 147 per cent during the seven-year period. It was estimated that the normal increase in values would have been about 43 per cent in the same time. The cost of constructing (not equipping) the rapid transit line traversing this district was only a little over \$7,000,000, so the increase in values was about seven times the construction cost.

In the Bronx over a strip one-half mile wide each side of the line there was a similar total increase from an original value of \$33,242,000 to about \$78,047,000—an increase of about 134 per cent, as compared with a normal increase of about 40 per cent. This section of line cost some \$5,700,000 to construct, so the enhancement here due to rapid transit was nearly five and one-half times the cost of the facility.

By means of rapid transit fund certificates, as an extension of payment for each of the seven annual proximity assessments, the landowner will be given the option of spreading each annual assessment in a number of payments over a period of years instead of paying the whole annual amount down at once, thereby making it easier for him to bear his share of the assessment.

The assessments of those who elect to make use of the rapid transit certificates will be combined into a single obligation and made the security for a district loan to be covered by series certificates of indebtedness, which will be marketed by the city in behalf of the property owners. Thus the city will at once realize on the annual assessment by transferring the combined obligations of such taxpayers to investors who will carry the load for a term extending beyond the annual payment period, thus permitting payment in smaller installments than are required by the immediate needs of the city.

This plan is an expedient to lighten the annual burden to the taxpayer, but it will cost him in the end more than if he paid the annual assessment in cash, by the amount of interest he will be required to pay in addition to the principal.

Mortgage bonds are to be issued covering the entire cost of the equipment and cars, or covering about one-third of the total cost of the project, including construction, equipment and cars. These mortgage bonds are to be authorized at the start and issued as needed. They represent the assessment against the rider for the benefits he is to derive from the rapid transit service.

The bonds, being borrowed money, will bear interest and sinking fund charges at the rate of 6 per cent. In this respect they differ from at-large and proximity assessments, which have no interest and sinking fund charges to bear. The interest charged on the bonds during the construction period is included in the amount of the bonds, but after operation begins interest and sinking fund charges are to be paid out of the operating revenues.



In order that the financial plan may be accomplished and the rapid transit program carried out efficiently, the procedure should be as follows:

(a) The Legislature should be asked to amend the present law to permit the methods of assessment herein proposed.

(b) An amendment should also be enacted creating a rapid transit commission; setting up the machinery to guide and control its proceedings; and empowering it to obtain, hold and disburse all rapid transit funds.

(c) The people of Detroit should be offered an amendment to the charter adopting the law as enacted.

(d) Providing the charter amendment carries, the people of Detroit will then be asked to approve a plan of rapid transit routes.

## Operating Aspects of Kansas City Safety Train\*

**One-Man, Two-Man Car, Three-Man Train Adds Greatly to Flexibility of Operation and Introduces Economies as Well as Providing Better Service—Company Enthusiastic About Results**

THE safety train developed by the Kansas City Railway has now been in operation long enough to determine its advantages from both the service and economy standpoint. The company claims as the advantages for this one-man, two-man, three-man train that it provides economical base schedule operation, maximum rush-hour capacity, minimum traffic delay and congestion, improved distribution of car loading, great flexibility in operation, practical and satisfactory adjustment of the extra list and greatly improved service for the public, with substantial reduction in operating expense.

The mechanical features of the cars comprised in the safety train were covered in an article in the *ELECTRIC RAILWAY JOURNAL* for March 10, 1923, page 402. To summarize here, these cars embodied several new and original features, as follows:

1. The pioneer use of complete safety devices on double-truck cars with multiple-unit control.

2. The first successful operation of 600-volt main power bus through the automatic coupler, this design including new drum switch design and blow-out coils and original safety features.

3. The original installation of automatic throw-over from trolley to battery supply for energizing the train control circuit, when it is desired to use the motors for regenerative braking in case the trolley pole should come off the wire.

4. An original platform arrangement designed to permit the cars to be used for either one-man or two-man operation, and including safety features developed originally for this company to permit the street fare collector scheme.

The company summarizes the results which have been achieved from their use as follows: A 50 per cent increase in number of non-rush hour seats; a 20 per cent increase in the number of rush-hour seats; 12.6 per cent increase in trip miles; 20.7 per cent decrease in platform expense despite a 5-cent an hour premium for one-man operation; 23.7 per cent decrease in man-hours and 16 per cent fewer total men required to operate the schedule.

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



Passengers Boarding at the Four 57-In. Door Openings of a Kansas City Safety Train

The train is shown standing on a 10 per cent grade. The two center doors are handled by conductors on the cars and the doors at the extreme ends of the train are handled by street collectors.

These new cars of the Kansas City Railway are operated in the non-rush hours as single-car units in charge of one man, and the street collectors are not on duty. In the rush hours they are coupled together and operated as two-car trains with three men, supplemented by street collectors who take positions at the front door of the forward car and at the rear door of the second car at important loading points.

In addition to the multiple-unit control and the arrangement for one-man or two-man operation, the flexibility of the train is further enhanced by the fact that the cars may be coupled or uncoupled at any point on the system without adding or removing equipment. As single units, these cars can be operated by one man or two men, and when in trains they may be operated with two, three or four men, as desired. No special storage house or terminal track arrangement is necessary for handling these cars. They can be uncoupled at short loop points or at any point on a line and one car used to fill the space with a minimum of inconvenience to passengers.

The company considers that in using these single



units with one man on a heavy line it is possible to furnish a more satisfactory service than with ordinary two-man operation, as part of the economy is shared with the public in reduced headway. In the non-rush hours the double-truck car with one man affords a comfortable riding unit, usually providing a seat for every passenger. In the rush hour trippers manned by two employees meet the base-schedule cars to which they are coupled, and this two-car unit with three men, aided by street collectors, goes through the rush period. The trippers with the two men then return to the carhouse, leaving the single one-man unit to continue on the base schedule.

**FARE COLLECTION PLAN**

The control of passenger movement and the system of collecting fares under different methods of operation have been satisfactorily worked out. A swinging gate on the platform can be locked open during two-man operation. For one-man operation it is arranged to swing only outward, thus separating incoming and outgoing passengers. When the operation is changed from one man to two man the fare box is moved from the front platform to the rear, and vice versa.

The scheme of using street collectors has been in use by the Kansas City Railway for some fifteen years, but it becomes of special importance and value in connection with the safety trains. Not only is the schedule speed increased by reducing the loading time, but carloads are equalized, giving more efficient use of the equipment. Sixty-three street collectors are used regularly by the company during the rush hours at heavy loading points in the business and industrial section, and on such special occasions as ball games, circuses, etc. Extra men are used for this duty.

Emphasis is made of the point that the street collectors are more than merely human fare-collecting devices. They are of material assistance in selling the service. Together with the three men on a train, they make five employees at heavy loading points who specially serve the public in the way of information and assistance, as well as expedite the service. The use of street collectors also brings about some reduction in the loss of fares.

**Symbols Replace Dates on New Los Angeles Transfers**

**This New Scheme Eliminates the Waste Which Must Occur with Dated Transfers—Saving Thus Effected Would Be Very Important on Large System**

A NEW type of transfer in which symbols replace printed dates has been introduced by the Los Angeles Railway. The change is said to have resulted in a considerable saving over the system formerly used as it eliminates the necessity for a surplus supply of transfers for each conductor.

Fourteen different symbols are used to distinguish transfers in the new system, a few of which are illustrated herewith. These are used without any regular sequence, the transfer bureau deciding that a certain type shall be used for each day, but not divulging the information until the day of issue. For instance, if the transfer bureau decides that a star shall be the designating symbol for the fifth day of the month, the information will be transmitted to the various carhouses

and a large metal sign carrying the designation, as illustrated, is conspicuously displayed to inform the trainmen. All transfers issued to conductors for that day will bear the design of the star. Since the passengers do not know in advance what design will be used, the chance of using old transfers is cut to a minimum.

Transfers formerly used by the company had the letter of the line, the day, month and date superimposed with the date figure in the largest type. In rush hours it was possible to pass a transfer of the corresponding day of a previous month.

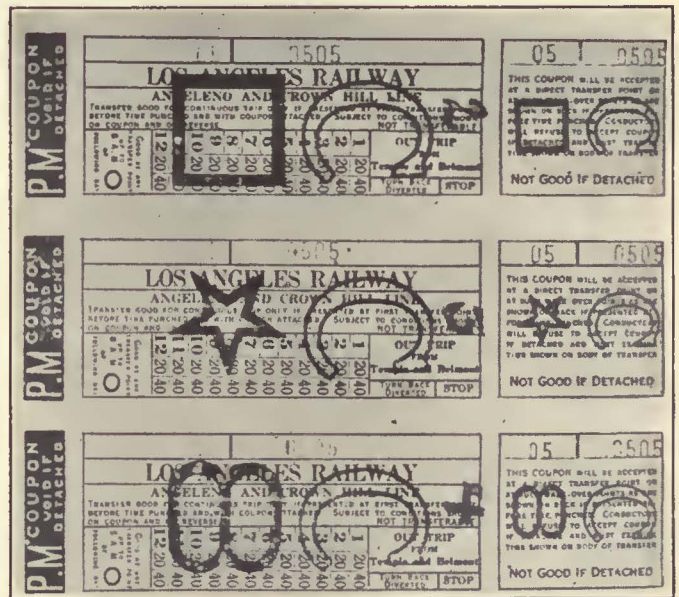
Another innovation in the new transfer is that

a p.m. coupon is provided, which cuts the number of transfer forms in two. Heretofore different transfers indicated "In" or "Out" trips, and different colored printing designated a.m. or p.m., making it necessary for a conductor to carry four sets of transfers.

With the change from dates to symbols, a considerable saving in printing is effected. Formerly all unused



A Metal Sign Bearing the Same Symbol as the Transfer Is Displayed to Inform the Conductors



Three of the Designs Used to Designate Dates on Los Angeles Transfer

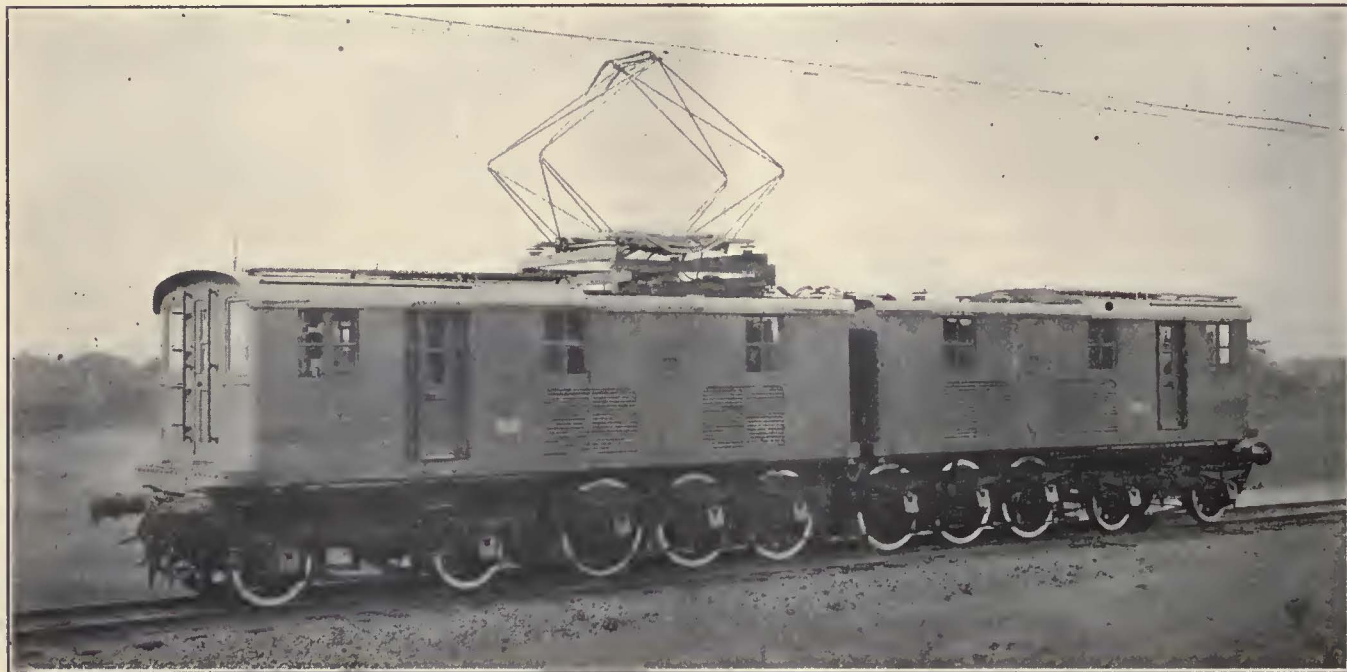
transfers marked for a certain date had to be thrown away, whereas with the new system, unused transfers are saved and reissued the next time the particular symbol is chosen at the designating mark. Since about 330,000 transfers are used on an average day, a very considerable saving is effected.

Mason Starring, president United Railway Investment Company, and Moritz Rosenthal, director of the Market Street Railway, San Francisco, have gone to San Francisco for a conference with city officials on the proposed sale of the Market Street Railway to the city. This matter has been a subject of previous discussion. The question of the valuation at which the property will be taken over is, of course, the important question to be settled.



# Electric Locomotives Tested at Erie

120-Ton Paris-Orleans Locomotive Designed for High-Speed Passenger Service in France Develops 105 M.p.H. in Preliminary Tests—Mexican Railway 150-Ton Freight Locomotive Has "Tug-of-War" with Mikado Type Steam Engine



This Paris-Orleans Locomotive Was Designed for Passenger Service at Speeds Up to 80 M.p.H.

TESTS of two new electric locomotives built by the General Electric Company and the American Locomotive Company for foreign roads attracted a number of engineers and railroad men to Erie, Pa., on Dec. 4 and 5. The locomotive built for the Paris-Orleans Railway was run over the test track at speeds between 62 and 81 m.p.h. In preliminary tests run Dec. 2 a speed of 105 m.p.h. had been reached. There was no apparent tendency toward objectionable movements which might have injurious effects upon the track. Records were also obtained by means of the otheograph, described in this paper Aug. 25, page 294, which would indicate freedom from nosing at high speeds. Examinations of the track showed complete absence of any detrimental effects.

There was also exhibited the new Mexican Railway freight locomotive, an exhibition run being staged on the tracks, together with a "tug-of-war" contest with a Mikado type steam locomotive, and a regenerative braking contest. During this test the electric locomotive, connected to send power back to the line, was hauled by the steam unit at a speed of about 14 m.p.h., the steam unit operating at full capacity. As high as 1,800 hp. was sent back into the system.

## SOME DETAILS OF THE PARIS-ORLEANS LOCOMOTIVE

In order to determine the type of passenger locomotive to be used on the 1,500-volt electrified lines of the Paris-Orleans Railway, orders were placed with various manufacturers for sample locomotives having approximately 80 tons on drivers and designed for maximum speeds up to 130 km. (80.3 miles) per hour. The G.E. locomotive

is of the gearless type, as shown in the illustration. Each main driving truck has three axles, each carrying the armature of a bipolar gearless motor. The truck frame consists of two steel plate side frames bolted to two end transoms and two intermediate transoms. The journals are of the collarless type, and the end thrust of the axle is taken up by a bronze and babbitt liner located on the outside of the wheel hub and running against a cast steel journal box.

The guiding trucks are also made up of steel plate side frames riveted and bolted to structural steel end frames and cross transoms. A longitudinal center member of structural steel supports a center plate for carrying a portion of the weight of the locomotive at the inner end of the truck. The outer end of this member carries the truck portion of the centering device, which forms a support for a portion of the weight of the superstructure.

A platform built up of structural steel longitudinal and cross members is bolted to each driving truck and supported near its outer end by the roller centering device resting on the guiding truck.

Each cab is of the box type containing a compartment at the outer end for the operator and the remainder for housing the apparatus. The outer end of the cab is tapered to a width of 8 ft. 7½ in., to conform to the specified clearance lines when passing around a minimum radius of 260 ft.

The driving motors are built for operation at 750 volts per commutator, with two motors in series. The field poles, field coils and brush-holders are mounted on the truck transoms, and the truck platform and cab



structures form a part of the magnetic path. The nominal one-hour rating with all covers off and operated on tapped field (75 per cent) is 395 French hp.\* at 675 volts and 408 French hp. at 750 volts. The continuous rating with blowers, based on a temperature rise of 120 deg. C., is 355 French hp. at 675 volts.

The under sides of the transom are covered with steel plates, and openings are provided for the forced ventilation. While the locomotive is not now equipped for regenerative electric braking, space is provided for the installation of equipment for this purpose if desired.

The control equipment is type PCL, electro-pneumatically operated, non-automatic, giving twenty-three resistance steps and eight running points with various groupings of the motors.

For speeds above the full field running connections, tapped field positions are provided. Two of these steps can be obtained in the series and series-parallel position and one in the full parallel position. Provision is made for disconnecting the motors on either half of the locomotive in emergency, so that the three remaining motors can be operated in series.

A master controller is located on the left-hand side of each operating cab, energizing the control circuits by means of current from a 72-volt storage battery.

Overload and short-circuit protection is secured by a high-speed circuit breaker which trips and inserts resistance in the circuit. After the resistance is inserted, a pair of line contactors then opens the circuit. This reduces the damage that can be done and protects the substation apparatus by quickly eliminating excessive power demands.

The auxiliary equipment includes air compressors, blowers and heaters which are operated through a separate circuit taking power from the 1,500-volt trolley. Forced ventilation for the traction motors is obtained by multivane type blowers, one of which is located directly above each motor. The three blowers on each

driving truck are direct connected to an inclosed series-wound 1,500-volt motor, and the two motors may be connected in series to reduce power consumption when the locomotive is operated at light loads.

The air brake equipment is of the French Westinghouse type for double-end operation and for control of both locomotive and train. Compressed air is furnished by two CP 32-A 1,500-volt compressors having a total piston displacement (at the low pressure piston) of about 3,600 liters (127 cu.ft.) per minute when delivering air at a pressure of 10 kg. per square centimeter (142 lb. per square inch). The compressor is of a two-



The Locomotive for the Mexican Railway Is for Heavy Mountain Grade Service

stage type with horizontal cylinders fitted with single-acting pistons.

THE MEXICAN LOCOMOTIVES ARE FOR FREIGHT SERVICE

The ten 150-ton, 3,000-volt locomotives to be used on the initial electrification of the Mexican Railway are of the geared type, and are designed for slow-speed freight service.

A single cab is mounted on two equalizer frames, which in turn are carried upon three two-axle articulated trucks. A motor is geared direct to each axle with twin spring gears.

The three trucks have steel side frames, to which the end frames carrying the draft gear and articulated joints are bolted. The superstructure is carried on center plates on the truck transom, bolted to the side frames at their midpoint, and the whole is carried on equalized semi-elliptic springs.

On each of the six axles there is a twin-geared G.E. 278-A railway motor with forced ventilation. These motors are designed to operate two in series on 3,000 volts. Each motor is supported on its axle by suspension bearings and on the transom by a spring nose support. An eighteen-tooth forged steel pinion is mounted on each end of the armature shaft and meshes with a ninety-tooth cushion type gear on the axle. This design permits a small movement of the rim about the gear center, thus tending to equalize the stresses in the gears and pinions and to minimize the shocks on the teeth.

The auxiliary machinery consists of a 3,000/1,500-volt dynamotor which has a 4-kw., 65-volt control generator mounted on a shaft extension, a 1,500-volt regenerative exciter set, two 1,500/3,000-volt motor-driven blowers and two 1,500/3,000-volt air compressors. The dynamotor provides 1,500-volt power for operation of the

WEIGHTS, RATINGS AND DIMENSIONS OF PARIS-ORLEANS ELECTRIC LOCOMOTIVES

Electrical data:	
Nominal voltage of system (d.c.).....	1,500
Tractive effort at one-hour rating and 1,350 volts, kg.,	6,630 (14,586 lb.)
Tractive effort at continuous rating and 1,350 volts, kg.,	5,700 (12,450 lb.)
Tractive effort at 30 per cent tractive coefficient, kg.,	21,800 (47,960 lb.)
Speed at one-hour rating and 1,350 volts, km.p.h.96.5 (60 m.p.h.)	
Speed at continuous rating and 1,350 volts, km.p.h.,	101 (63 m.p.h.)
Number and type of motors...Six G. E. 101-A (750/1,500 volts)	
Total horsepower of locomotive at one-hour rating.....	2,370*
Total horsepower of locomotive at continuous rating.....	2,130*
Mechanical data:	
Track gage, meters.....	1.45 (56 1/4 in.)
Wheel arrangement.....	4 — 6 + 6 — 4
Diameter of drivers, mm.....	1,200 (47.2 in.)
Diameter of guiding wheels, mm.....	915 (36 in.)
Total wheelbase, meters.....	16.32 (53 ft. 6 in.)
Maximum rigid wheelbase, meters.....	2.85 (9 ft. 3 1/2 in.)
Width over all, meters.....	2.93 (9 ft. 6 in.)
Length over buffers, meters.....	19.02 (62 ft. 0 in.)
Height over trolley, locked down, meters.....	3.84 (12 ft. 6 in.)
Weights:	
Total weight on drivers, kg.....	72,600 (159,720 lb.)
Weight per driving axle, kg.....	12,100 (26,765 lb.)
Total weight on guiding axles, kg.....	35,800 (79,200 lb.)
Weight per guiding axle, kg.....	8,950 (19,690 lb.)
Electrical and air brake equipment, kg.....	46,400 (102,880 lb.)
Mechanical equipment, kg.....	62,000 (138,600 lb.)
Total weight, kg.....	108,400 (238,480 lb.)

\*French horsepower of 736 watts.



blowers, compressors and the regenerative exciter set. The control generator furnishes current at 65 volts for lights, headlights, foot warmers, control circuits and for charging the storage battery.

The two air compressors are of the two-stage horizontal-cylinder type and have a total piston displacement of 150 cu.ft. per minute when delivering air against 130-lb. pressure. They operate two in series on 3,000 volts.

The air brake is Westinghouse No. 14 EL, double-end, straight and automatic equipment, arranged for double-heading locomotives. Provision is made to prevent application of the air brakes on the locomotives during regenerative braking, while the brakes may be applied on the remainder of the train.

The locomotives are equipped with type PCL electro-pneumatic control for non-automatic, multiple-unit operation. The master controllers are arranged to give a total of thirty-one accelerating steps and nine running points, which for a tractive effort of 50,000 lb. and 2,700 volts on the contact line correspond to speeds of approximately 5.4, 6.0, 6.75, 11.4, 12.8, 14.2, 17.4, 19.6 and 21.6 m.p.h. This range of speeds is obtained by connecting the motors six in series, three in series in two parallel circuits, and two in series in three parallel circuits. One full-field point and two reduced-field points are included on each connection.

REGENERATIVE BRAKING IS PROVIDED TO CONTROL SPEED ON-DOWN GRADES

Regenerative braking on the down grades is accomplished by exciting the fields of the traction motors by the regenerative exciter. Fifteen regenerating steps are provided for on the master controllers for each of the three motor groupings.

The main motor circuits are protected by a quick-acting circuit breaker which serves as a line breaker, as well as to give overload protection. Current is collected through one or both of two pantograph trolleys, which have a range of 15 ft. 5 in. to 24 ft. above the rail. They are raised and held against the wire by air pressure and are retracted by gravity when the air pressure is released.

The cab is 47 ft. 6 in. long and 10 ft. wide. An apparatus compartment is in the middle of an engine-man's cab 5 ft. long at each end. The rheostats extend each way from the center of the cab about one-half the length of the apparatus compartment. Their height is approximately 3 ft. Near each end is a ventilating flue to carry off the heat. The roof of the rheostat compartment is insulated against heat and is used as a shelf upon which the auxiliaries are mounted.

The control apparatus compartment on No. 1 end contains the main switch, quick-acting circuit breaker, lightning arrester, other protective apparatus and some of the accelerating contactors. The corresponding compartment on No. 2 end contains the cam switches for grouping the motors for the different motoring and regenerating combinations, the reverser, the motor cut-out switches and the remainder of the accelerating and field reducing contactors.

The Mexican Railway Company, Ltd., is one of the oldest railways operating in Mexico. Its main line runs between Vera Cruz and the Gulf of Mexico and Mexico City. The section between Orizaba (about 70 miles inland from Vera Cruz) and Esperanza, a distance of 30 miles, is now being electrified. This section,

DIMENSIONS AND DATA OF ELECTRIC LOCOMOTIVES FOR THE MEXICAN RAILWAY

Electrical data:	
Nominal voltage of system, (d.c.)	3,000
Tractive effort at one-hour rating and 3,000 volts, with blowers, lb	54,300
Tractive effort at continuous rating, lb	46,200
Tractive effort at 30 per cent tractive coefficient, lb	92,400
Speed at one-hour rating and 3,000 volts, m.p.h.	20
Speed at continuous rating and 3,000 volts, m.p.h.	20.5
Total horsepower of locomotive at one-hour rating	2,700
Total horsepower of locomotive at continuous rating	2,500
Number of motors	6
Type of motors	G.E. 278-A (1,500-3,000 volts)
Gear ratio	90:18
Mechanical data:	
Track gage, inches	56½
Wheel arrangement	0-4-4-4-0
Diameter of drivers, inches	46
Number of driving axles	6
Total wheelbase	40 ft. 6 in.
Maximum rigid wheelbase	9 ft. 2 in.
Width over all	10 ft. 1½ in.
Height over trolley, locked down	15 ft. 2 in.
Length inside knuckles	52 ft. 11 in.
Weights:	
Total weight on drivers	308,000
Weight per driving axle	51,300
Dead weight per axle	12,150
Electrical and air brake equipment	135,000
Mechanical equipment	173,000

known as the Maltrata incline, includes the most scenic country in Mexico.

Because of the mountainous country through which the railroad passes from the sea level at Vera Cruz to the great Mexican plateau, with a change in elevation of some 8,000 ft. in 100 miles, many severe grades and sharp curves are encountered. A difference of 4,000 ft. in elevation exists in the 30-mile section which is now being electrified.

Freight trains weighing 700 tons will be taken up the grade with two electric locomotives, one at the head end and one at the rear. Trains of about the same weight will be brought down the grade with one locomotive by regenerative electric braking. Speeds both up and down grades for freight trains will average about 15 m.p.h.

All but an occasional passenger train can be taken over the grades by a single locomotive. As it is considered unsafe to run trains down the grades and around the sharp curves at more than 20 m.p.h., the same locomotive with the same gear ratio will be used for freight and passenger service. Speeds of passenger trains will average about 18 to 20 m.p.h. both up and down grades, although the locomotives can operate at a maximum speed of 33 m.p.h.

A Street Car in Copenhagen, Denmark



How would people of the average American city like cars of this variety? Note three-way egress and half-covered upper deck with less than standing headroom under the roof.—Copyright, Gilliams Service.



# Platform Men Pass Civil Service Tests

San Francisco Requires Applicants for Position of Motorman and Conductor to Take Athletic Examination, Including Ladder Climbing, Horse Vaulting and High Jumping, as Well as an Examination on Relative Capacity and Knowledge of Duties  
—Each Examination Is Considered of Equal Importance

**P**ROSPECTIVE motormen and conductors must pass an athletic test before being employed on the San Francisco Municipal Railway. They must be able to climb a ladder by their hands, dip on the parallel bars at least five times, vault the horse, and otherwise prove that they are in fit muscular condition, besides passing the more common medical examination for organic troubles and the usual test for eyesight and hearing. The specification for motormen and conductors on the San Francisco Municipal Railway has always called for a rather stiff physical examination, but the requirements have been made more strict recently, partly because the system has no age limit for new men and partly because all employees of the municipal railway now, after the first six months of their employment, automatically become members of the retirement system of the city and county of San Francisco. This arrangement became effective on April 1, 1922.

All employees of the San Francisco Municipal Railway, except executives and one or two experts, come under the civil service regulations. Hence, candidates for the position of motormen and conductors have to be passed by the Civil Service Commission of San Francisco before they are eligible for appointment.

## CIVIL SERVICE TESTS

The athletic test for motormen and conductors, already mentioned, has a relative weight for eligibility of 50 on a scale of 100, and a written examination, called a test for relative capacity and general knowledge of duties, also has a weight of 50 on the scale of 100. All of these three tests, except the test on general knowledge of duties, are the same for motormen and for conductors. Applicants must receive a rating of not less than 75 per cent on each of these tests or are rejected. The practice is to conduct first the athletic test. If that is passed successfully, applicants for positions as platform men will receive copies of the rules of the municipal railway to study for the test on general knowledge of duties.

The "athletic test" consists of the following:

1. *Ladder Work*—Hand over hand, up and down ten rungs; only one hand allowed on each rung; perfect mark, 10 credits.
2. *Lifting 50-lb. Dumbbell*—Five consecutive lifts with each hand. Lifts to be made from lowest reach of arm to highest reach, without aid of jerk or swing, while standing erect with feet close together; perfect mark, 10 credits.
3. *High Jump*—4 ft., 10 credits; 3 ft. 8 in., 8 credits; 3 ft. 4 in., 6 credits; use of springboard not permitted.
4. *Vaulting the Horse*—Perfect vault over horse, 4 ft. 6 in. high, without touching it with any part of body except the hands, 10 credits; good vault (feet slightly touching horse), 8 credits; fair vault (body slightly touching the horse), 6 credits; slide over horse, 0.
5. *Dipping on Parallel Bars*—Five dips at 2 credits each; dips must be made with legs straight and without assistance of kick or swing.
6. *Carrying 150-lb. Sack of Sand*—Sack must be lifted from floor, placed on shoulder and carried up and down six steps; mark 10 credits. No partial credits, and no more than two trials allowed.

7. *Running* (distance about 140 yards)—Eighteen seconds, 40 credits; nineteen seconds, 37½; twenty seconds, 35; twenty-one seconds, 32½; twenty-two seconds, 30; twenty-three seconds, 25; twenty-four seconds, 20; twenty-five seconds, 15; twenty-six seconds, 10; twenty-seven seconds, 5. Fifth seconds to be rated proportionately.

As explained, applicants must also pass a satisfactory medical examination before a physician appointed by the commission. Those unable to hear with each ear ordinary conversation at a distance of 20 ft. or unable to read with each eye without glasses at a distance of 20 ft. letters on Snellen's eye chart marked "30" will be rejected. Applicants for both motormen and conductor positions must also pass a test as to their color vision. They must be citizens of the United States, twenty-one years of age or over, and residents of San Francisco for at least one year preceding the examination. Under the city charter, war veterans are entitled to claim a preference of five credits, but to secure this credit they must file with the commission, with their application for the position, a certificate of honorable discharge or of honorable active service.

## WRITTEN TESTS ON INTELLIGENCE

The written examinations on relative capacity and general knowledge of duties are conducted at certain times announced in advance by the Civil Service Commission. The regulations in regard to these examinations are printed and very definite. Thus, during the course of the examination no participant is permitted for any reason to leave his seat, unless he first turns in his examination papers, and he then will be considered as having withdrawn from the examination. Nothing is permitted on the desks of the competitors except the examination booklet and pens and ink and blotters furnished by the commission. Applicants may use their own fountain pens only if those pens are supplied with ink that dries black. Applicants are advised that no questions should be asked of the monitors in charge of the examination because none will be answered. If the applicant thinks he finds cases of ambiguity or oversight in the examination papers or instructions which are the fault of the commission, they will not be discussed during the examination. If the applicant wishes to bring them up, in explanation of his failure to do his work properly or for any other reason, he can make such complaint by writing to the commission within three days after the examination.

The practice in conducting the examination is that each applicant who has passed the athletic test and has applied for permission to take the written test will receive a credential. He keeps this credential until the written examination and it must be shown at the door of the examination room to secure admittance. The candidate is then assigned to a seat and places the credential before him on his desk, leaving it open and face up, so that it can be quickly inspected and collected by the monitor. After the credentials have been collected, the examination booklets are distributed face up.



The written examination for a motorman or a conductor lasts about forty-five minutes. If a person wishes to take an examination for both positions, he is permitted to do so. This will take about fifteen minutes longer.

The time spent in these examinations is very definitely regulated by gong signals. At the first gong signal, the applicant is told to take up his pen and write his name and address on a blue gummed identification slip which he finds attached to the cover of his examination booklet. After writing his name on this sheet he is told to fold it over and paste it down by means of a gummed edge that is provided, and he is warned not to write anywhere else on the examination paper his name or other identification mark.

Altogether there are six tests, and the time for the beginning and ending of each is indicated by a gong signal. At the close of the forty-five minutes, the gong is rung three times. This means that all applicants for positions must stop writing and must rise and stand by their desks until the monitor collects the examination booklets. Then at four strokes of the gong applicants leave the hall.

EXAMINATION ON RELATIVE CAPACITY

There are five examinations on relative capacity, and, as explained, these are the same whether the candidate wants employment as a conductor or as a motorman. Each examination question is so drafted that the answer is very brief and can be written on a blank line next to the question. Figuring for the arithmetical test must be done on the back of the cover sheet of the booklet.

The first test in relative capacity is on some simple questions in arithmetic. A few typical questions taken from the examination sheet of Jan. 31, 1922, follow:

At 7½ cents each, how much will a dozen power fuses cost?

How many weeks will it take to pay for a \$35 uniform at \$10 down and \$5 at the end of each week?

If a conductor starts on his run with \$5.75 and collects seventeen 5-cent fares, how much will he then have?

How many 5-cent fares will it take to pay for the damage done in a collision with an automobile if the cost was \$150?

The second examination is on "sentence meanings." There are twelve groups of four sentences each, and the applicant in this test is required to make a cross mark in the parentheses before the sentence which has most nearly the same meaning as the numbered sentence heading the group. The upper part of a recent examination sheet, with four typical questions, is reproduced below:

TEST 2 SENTENCE MEANING Relative Capacity

In each group of sentences below, make a cross (X) in the parentheses before the one sentence which has most nearly the same meaning as the first sentence (in capital letters). The first example is already marked correctly. Work until the gong rings and then start on Test 3. Any example where more than one sentence is marked in any way will be counted as incorrectly answered.

1. MAKE HAY WHILE THE SUN SHINES.  
 Take advantage of your opportunities.  
 Don't work too hard.  
 Don't stay up too late.
2. MANY ARE GOOD BECAUSE THEY CAN DO NO MISCHIEF.  
 Evil sees as evil thinks.  
 The good can do no wrong.  
 The cat is honest when the meat is out of reach.
3. WHERE THE WILL IS READY THE FEET ARE LIGHT.  
 Where there's a will there's a way.  
 Expression is the dress of thought.  
 A burden which one chooses is not felt.

4. FIGS DO NOT GROW ON THISTLES.  
 Great oaks from little acorns grow.  
 Good does not come from evil.  
 Faint praise is often strong censure.

The third test is that of "reasoning by analogy." Here the applicant is required to check one of four words which most correctly completes a definite sentence. Here also an example is given as shown below, the proper word being underscored in the first example of the four quoted taken from the examination paper.

TEST 3 REASONING BY ANALOGY Relative Capacity

In each example below, draw a line under the only one of the four words in the column which is the right word to complete the sentence. The first example is already marked correctly, for roar is what a LION does just as bark is what a DOG does. Answer as many as you can before the gong rings; then begin on Test 4. Any example where more than one word is underlined will be counted as incorrectly answered.

DOG is to BARK as LION is to	zoo <u>roar</u> animal man	FLOORWALKER is to STORE as POLICEMAN is to	uniform badge street authority
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STREET CAR is to WAGON as FAST is to	wheel trolley slow horse	RULER is to LENGTH as CLOCK is to	strike time second wood
---	-----------------------------------	--------------------------------------	----------------------------------

CRIMINAL is to PRISON as PATIENT is to	jail hospital court medicine	FRAME is to PICTURE as LAKE is to	island water drawing river
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STREET CAR is to PASSENGER as PATROL WAGON is to	car barn ticket fare prisoner	DOG is to OLD as PUP is to	kitten young small play
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Test 4 is on "word knowledge." Here the applicant is required to draw a line under the one word which in each group means the opposite or most nearly the opposite of the top word in each group of five words. In the first example, "soft" is underlined because it means the opposite of "hard." Six examples are given from the examination paper.

TEST 4 WORD KNOWLEDGE Relative Capacity

In each of the lists below, draw a line under the one word which means the opposite or most nearly opposite of the top word in the list. The first one is already marked correctly—"soft" is underlined because it means the opposite of "hard." Answer in order as many as you can until the next gong signal, then start on Test 5. Any example where more than one word is underlined will be counted as incorrectly answered.

HARD	CLEAN	FROM	VALLEY	COMMON
hardy	lean	upon	mountain	cheap
<u>soft</u>	dirty	form	river	law
smooth	urge	by	mine	unusual
pliant	screen	to	gravel	costly
MARRY	FORGET	INNOCENT	REVEAL	MINUS
ceremony	idea	guilty	congeal	plus
divorce	memory	proof	conceal	minor
court	remember	convince	relate	minority
engage	vision	doubt	veal	bonus
CIVIL	MENTAL	CORRUPT	AMIABLE	BLISS
civic	brain	eruption	surly	lass
martial	nerve	honest	amenable	blithe
marital	thought	home	pliable	aged
revile	material	correct	liable	agony



The fifth and last examination under relative capacity is on penmanship. Here the applicant is asked to copy line for line and word for word the way it is printed in the examination sheet the following pledge:

"I pledge allegiance to my flag, to the Republic for which it stands; one nation indivisible, with liberty and justice for all."

There are spaces where this pledge can be copied a number of times until the gong sounds for the next examination.

**KNOWLEDGE OF DUTIES**

The final test is on knowledge of the duties of the position for which the man has applied. In each examination there are 100 questions relating to practical details of the services with which the applicant has presumably become familiar through a study of the rule book. These questions are arranged so that they can be answered very easily if the applicant knows the right answer. The heading of the examination blank for conductor with the first eight questions, two of which are answered as examples, as reproduced below, is followed by several questions in similar form from the examination paper for motormen.

**TEST 6 KNOWLEDGE OF DUTIES CONDUCTORS**

Some of the following statements are true and some are false. If the statement is true underline TRUE. If the statement is false, underline FALSE. Do as many examples as you can before the next gong signal; then stand up and remain silent in your place until the following gong signal. (See front cover.) Any example where both true and false are underlined will be counted as incorrectly answered. The first two statements are samples correctly underlined.

- 1. TRUE FALSE The Bulletin Board must be examined daily for special bulletins posted thereon.
- 2. TRUE FALSE Ignorance of rules will be accepted as an excuse for violation of same.
- 3. TRUE FALSE Verbal orders of subordinate officials must be promptly obeyed.
- 4. TRUE FALSE "Oversleeps" are not entered on the employee's record.
- 5. TRUE FALSE The official badge, punch, and cap ornament will all be furnished by the Railway.
- 6. TRUE FALSE The loss of rule book must be reported immediately to the Car Dispatcher, or person in charge of the office.
- 7. TRUE FALSE The record kept of each employee should be filled out in careful detail and made as full as possible.
- 8. TRUE FALSE The penalty for the fourth oversleep in a calendar month is ten days' suspension.

**TEST 6 KNOWLEDGE OF DUTIES MOTORMEN**

- 27. TRUE FALSE Motormen will recognize buzzer signal both to stop or to start car.
- 28. TRUE FALSE Except when regulated otherwise, cars must be brought to a full stop at street railway intersections.
- 29. TRUE FALSE Except when regulated otherwise by special bulletin, cars will stop at the near side of all intersecting streets to receive and discharge passengers.
- 30. TRUE FALSE When stopping at a painted stop mark the motorman must stop car with fender roll four feet behind such stop mark.
- 31. TRUE FALSE The motorman must close front gates immediately after starting car.
- 32. TRUE FALSE A motorman may start car on signal from conductor collecting at front gate.

No credit is allowed in the examination of either motormen or conductors for previous experience.

In spite of the rather rigorous type of examination required, it is interesting to note that a fairly large number of men are able to pass both athletic and written tests. Thus, in the last examination held, the physical test for motormen was taken by 695 applicants, of whom 620 passed. The same test for conductors was taken by 701 applicants, of whom 615 passed. The written test for motormen was taken by 574 persons, of whom 337 passed. The written test for conductors was taken by 575 persons, of whom 370 passed.

**TESTS FOR INSPECTORS**

Inspectors on the San Francisco Municipal Railway are promoted from the ranks of the motormen and conductors. The examination for inspectors is somewhat similar to that required of motormen and conductors, except that no athletic test is required. There are the four examinations on relative capacity and the one on penmanship, quite similar to those already described for motormen and conductors, but the examination on knowledge of duties covers, of course, the duties of the office which the applicant is seeking. The questions are arranged, however, in a similar manner to those for motormen and conductors, so that the applicant may simply underscore one of two words to indicate his answer to the question. Typical questions from the examination for inspectors, car dispatchers, car starters and receivers are given below:

**TEST No. 6 KNOWLEDGE OF DUTIES INSPECTORS, CAR DISPATCHERS, CAR STARTERS AND RECEIVERS**

- TRUE FALSE It is the duty of the Receiver to see that the conductors take outfits for their runs at the time called for by the time schedules.
- TRUE FALSE It is the duty of the Inspector to see that all conductors' outfits are properly accounted for and restored to their proper places.
- TRUE FALSE Before cars are taken out of the barn in the morning the Car Starter must have posted all car numbers and car box numbers.
- TRUE FALSE The Dispatcher must arrange the daily detail of crews.
- TRUE FALSE The Receiver must provide emergency crews each day for the following day.
- TRUE FALSE An employee shall not discuss with passengers the business of the railway in a manner detrimental to its welfare.
- TRUE FALSE The Flood Building is at the corner of Powell and Market Streets.

It is interesting to note that out of the 208 applicants who took the last examination for inspectors, 156 passed. A general average of 75 per cent or better is required.

**WAGES PAID**

The present scale for platform men, effective Sept. 16, 1923, is as follows: Conductors and motormen, 67½ cents per hour; bus operators (recruited from the ranks of conductors to operate one-man buses), 72½ cents per hour; motormen on work car and track grinding car, 72½ cents per hour.

All of these employees are allowed time and a half for overtime after eight hours and twenty minutes, and are required to lay off one day in seven. Eight hours is the basic day for all employees. Each employee has a vacation of twelve days a year with pay.

The municipal railway system has two grades of inspectors, first and second. This grading is somewhat arbitrary, as it is based on the duties performed and not on the percentage obtained in examination. Road



or line inspectors constitute the first grade and starters and receivers the second grade. Dispatchers are taken from the ranks of the road inspectors.

#### RETIREMENT SYSTEM

The city of San Francisco has a retirement or pension system with death benefits for all city employees, and since April 1, 1922, the municipal railway employees have been included in this system. In fact, membership in this retiring fund is compulsory after six months of service for all municipal railway employees who receive salaries not to exceed \$500 a month.

The amount of the payments made to the fund by the employees depends upon the age and salary earned, and an equal amount to the sum paid by the employee is contributed to the fund by the Municipal Railway. The cost to the municipal railway system for all employees, under the present wage scale, is approximately 9 cents per car-hour, made up of 6½ cents for the platform men and 2½ cents for other employees. Retirement is obligatory at the age of 70, but employees who have completed ten years of continuous service and have reached the age of 62, or those who have completed thirty years of service and have reached the age of 60, may retire any time after reaching these ages, if proper notice is given to the authorities.

The annuity received consists of the actuarial equivalent of the contributions made by the employee, plus those made by the municipal railway in his behalf, plus an additional pension, purchased by the contributions of the city and equal to 1½ per cent of his final compensation, multiplied by the number of his years of service, provided if he is 62 or more. If less than 62 and with thirty years' service, a slight modification of this method of calculating the pension is followed. Employees who withdraw from the service of the municipal system before becoming eligible to an annuity are entitled to their own accumulated contributions. There are also certain disability and death benefits.

The municipal railway has 1,070 employees, of whom 820 are platform men.

## How Kentucky System Has Been Modernized\*

Various Measures Taken in the Successful Elimination of Bus Competition by Means of Superior Service Are Summarized

THE developments that have been carried out in modernizing the plant and operation of the Kentucky Traction & Terminal Company, Lexington, Ky., have been covered step by step as they were accomplished in various issues of *ELECTRIC RAILWAY JOURNAL*. To bring these together in a summary, however, makes a story of accomplishment that is worth recording.

The Kentucky Traction & Terminal Company operates 70 miles of interurban lines and 21.5 miles of city lines in and around Lexington. It has completely re-equipped its railroad system with a newly developed type of light-weight one-man double-truck passenger and freight cars, the former designed especially to give maximum comfort, speed and economy of operation. This complete replacement of rolling stock made it possible for the company to standardize on one type of

motor and general equipment. The exchange of heavy equipment for light-weight cars has materially reduced the actual depreciation in the physical structures of track and roadway and has thereby reduced the future cash expenditures and prolonged the life of the investment.

For the public, the company has reduced all classes of transportation charges on the interurban system by 16½ per cent and has increased the service from a headway of one and one-half hours to a headway of one hour on all lines. It has given the public cars to ride in that it believes are as comfortable as a private automobile, and equal, if not superior, to any form of electric railway car now being operated. The public has responded with a generous measure of good will. The success of the company's modernization program, the attractiveness and comfort of the new cars and general progressive policy have made the company very popular.

The security holders have benefited because the management has converted the railway property from a situation where for the year prior to the conversion of the equipment an operating deficit existed into a property with an operating surplus over and above all charges. The property has thus been made self-supporting and the investment placed on a sound earning basis and one which the company believes can safely be maintained in the future against any form of competition.

From the standpoint of the car operator, the company's complete one-man operation has placed additional responsibility on the operator for which he is being paid a higher compensation. The company feels that it is making a better man out of him for himself and for the company as he is given a superior position.

The company has kept the public informed through consistent advertising, stating its activities and position in frank and definite manner. A recent advertisement stated the company's position as follows:

"During the past ten years it has always been our aim to keep abreast of advancing conditions and so to align our services that we may at all times be able to provide you with facilities commensurate with the population of those communities we serve. We shall continue to serve you to the best of our ability at rates equitable with the character and quality of good service rendered, and in line with principles of efficient business administration."

To carry out its construction program involving an expenditure of \$375,000, which was a heavy commitment for this company in the face of a deficit from operation and organized bus competition, required courage, vision and conviction on the part of the company and its board of directors that the industry is permanent and can be placed on a sound earning basis if properly developed along lines that make the service of more than ordinary value to the public.

Some of the operating results accomplished are a reduction of 63 per cent in late trains, expressed in hours; a reduction of 41 per cent in the ton-miles of cars operated, despite the increase in service; a reduction of 18 per cent in the kilowatt-hours of energy consumed, although there was an increase of 8.4 per cent in cars operated. Revenue per car-mile has decreased from 45.6 cents to 37.1 cents, but operating expenses have also been reduced from 35.4 cents to 22.3 cents. The energy consumption per car-mile is now 2.92 kilowatts, as compared with 4.93 formerly.

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



# Association News & Discussions

## One-Man Car Experience\*

One-Man Operation Has Shown Considerable Economies on Beaver Valley Line—Favors Double-Truck Car to Birney Type—Troubles Experienced and Changes Made and Results Obtained Are Detailed

By W. H. BOYCE,

General Manager Beaver Valley Traction Company,  
New Brighton, Pa.

SO MUCH has been said and is known of the one-man car being a life-saver for the smaller properties that today it becomes a question not of whether a company can get along without switching from two-man to one-man operation, but whether or not it is not mismanagement for a company to operate two-man cars when one-man cars would fill all of the requirements.

Aside from the operating problems entailed by reason of cars of certain routes operating into congested portions of a comparatively few cities, and in the full knowledge that there are other conditions such as several dangerous railroad crossings on comparatively short routes, and kindred problems, yet in my opinion there is no reason why more or less one-man cars cannot or should not be operated on most all properties throughout the country.

Of course there are one-man cars, and then again there are one-man cars.

There is no doubt that the single-truck, slat-seated, one-man car will receive a black eye in any community where an attempt is made to substitute it for comfortable, good-appearing, double-truck cars, particularly if track conditions are not good. But a rebuilt double-truck car or a new double-truck car properly heated and fitted with upholstered, properly spaced seats, mounted on smoothly riding trucks, can in most, if not all, cases be made to supplant the existing two-man service, at the same time rendering a better, more economical service.

I have not visited every one-man property in the country, nor have I sent out questionnaires to the companies operating one-man cars; therefore, I feel that I should confine this paper to our experience with the one-man car on the property of the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway Company.

It might be well to explain that our system is split up into 2-mile zones, that we have a base fare of 5 cents for each zone, and that one route has as many as seven zones. Cars that are

operated through more than two zones are equipped with Shanklin zone fare machines, with the aid of which the operator issues a receipt to the passenger when he boards the car and deposits his fare in the locked fare box. The passenger retains this receipt until he reaches his destination, surrendering it to the operator as he leaves the car. In addition to operating the car, issuing and accepting zone checks as above described, the operator makes change, sells several kinds of weekly passes, issues transfers, and when we have our bargain sale of tickets twice annually he sells twenty-four tickets for \$1.

With the exception of six two-man cars that are being used for tripper service only and which on account of their age and condition we do not deem it economy to rebuild, we are operating 100 per cent one-man cars. Of these, twenty are standard Birney safety cars, manufactured by the Osgood Bradley Car Company, ten of which were put into service in September, 1920, and the other ten were put into service on Aug. 5, 1921. Six of our one-man cars are 36,000-lb. Brill semi-convertible cars, which we have rebuilt for one-man operation and on which all safety features were installed. These cars were equipped with new spring-cushion, cane-upholstered seats; the motor frames, trucks and car bodies were thoroughly overhauled, and the bodies painted inside and out, the exterior having been changed from a dark red to a taxicab yellow. We also have six new double-truck, one-man, two-man cars which are just being put into service.

I wish to call to your attention the fact that these six new cars are equipped with a storage-battery emergency lighting system; aluminum stanchions; Golden Glow 94-watt headlights; Holophane shades; double air-operated doors; four air sanders; electrolytic lightning arresters mounted in cab; and the car bodies are mounted on Standard C.P.-35 trucks, which is the easiest riding truck that we have ever had on our property.

Although in some few cases our headway between cars was decreased with the installation of the one-man

car, our hauling is so comparatively light through the day and after the rush hour in the evening that for the ordinary business offered the single-truck car provides sufficient capacity, and as a consequence in most all cases our two-man cars have been replaced with one-man cars, adequate tripper service being furnished to take care of the morning and evening rush-hour periods.

It is not very often that a street railway manager admits that he has made a mistake, but I will say to you very frankly that we made a serious mistake when we purchased twenty safety cars. On some of our lines we have an interval of twenty minutes between cars through the non-heavy hauling hours, during most of which time the single-truck car has sufficient capacity to handle the ordinary business offered, but if one of them happens along at the finish of a football or basketball game, a concert, a dance, a lodge meeting, at the time of a train or interurban connection, or what-not, there is oftentimes not sufficient capacity properly to accommodate the passengers presenting themselves for transportation.

These things do occasionally happen, regardless of the fact that we have tried our best to get the officers of lodges and management of theaters, etc., to advise us of any unusual number of people that gather in their places of business or amusement, so that we may furnish adequate car service to take care of them.

We have not found it necessary to slow down our schedules by reason of the adoption of the one-man car, but, as will be explained later, we have made some improvements that are partly responsible for this. There is and has been for a number of years a slow portion of the schedule which starts at 3:21 in the afternoon and continues until 8 o'clock at night to take care of the rush-hour load. The slowest that any of our cars are operated on this schedule is 9 m.p.h., and during the off-peak hours the rate is 12 m.p.h., with no lay-over on our heaviest hauling lines.

On the two-zone routes, the passenger pays-enter in the first zone and pays-leave in the second zone. This works out very satisfactorily.

We have had but little trouble in concluding a suitable agreement with the Amalgamated Association regarding the operation of these cars. We know that the majority of our car operators would rather operate one-man cars at 5 cents per hour increase in their wage than operate two-man cars. Last year at agreement time,

\*Abstract of paper presented before Pennsylvania Street Railway Association at Harrisburg, Pa., Dec. 4, 1923.



anticipating that we were going to a 100 per cent one-man operation, in addition to providing for paying one-man car operators 5 cents per hour in excess of the rate for two-man car operators, we gave the officials of the association a letter stating that so long as it became necessary for us to maintain crossing flagmen at certain points, we would put on these flagmen jobs trainmen who on account of age or other disability were not competent to operate one-man cars, and pay them at the former year's rate of pay, which is 7 cents less than the present two-man car rate, and of course 12 cents less than the present one-man car rate.

We had no difficulty with the councils or officials in the thirteen boroughs through which we operate when we installed the one-man car.

To make the operation of these cars easy and speedy for the trainmen, we have installed Nachod automatic block signals and electric track switches at all points where either can be used. To further aid the trainmen in making their schedule, we have installed at our heavy transfer points (where cars of three routes connect every ten minutes) an automatic signal system by means of which the operator of a car upon arriving at the transfer point knows that there is or is not a car of the connecting line within one-half mile of the transfer point. This has resulted in a considerable saving of time. Prior to the installation of these signals we had a rule requiring the operator of a car to wait at the transfer point for three minutes. If the approaching car was not in sight (the distance at which it became visible in either direction being about two squares), the operator was then permitted to proceed. Under the present arrangement, if after the operator has waited one and one-half minutes the block does not indicate that his connecting car is approaching he may proceed.

#### REDUCTIONS IN OPERATING EXPENSES

Today we carry on our list sixty-five trainmen, thirty-nine of whom are scheduled for the operation of regular runs, and twenty-one for trippers. Four years ago we carried on our list 110 men, eighty-nine of whom were scheduled for regular runs, and ten for trippers; while twelve years ago we were compelled to carry on our list ninety-eight men, eighty-eight of whom were scheduled on regular runs. Today our receipts are running in the neighborhood of \$630,455 per year; four years ago they were \$599,559 per year, and twelve years ago they were \$341,066 per year. In other words, today our receipts are more than twice what they were twelve years ago, and we employ thirty-three less trainmen, trippers and regular runs both being considered.

We do not believe it necessary to go into detail on the man-hours and car-hours, except to say that for the first ten months of this year, had we been operating two-man instead of 100 per cent one-man cars, our trainmen's

wages on the present wage rate would have shown an increase of \$85,000, and at that rate we would soon be in the hands of the sheriff.

As regards our car mileage and power costs, for the year prior to the installation of the one-man cars, 1919, our total car mileage was 1,522,752, while the power cost was \$91,332. In September, 1920, we added ten one-man cars, and the total car mileage in 1920 was 1,544,335, and the power cost for that year was \$78,910.19. In August, 1921 we added ten additional one-man cars, and our car mileage for that year was 1,691,383, the power cost for that year being \$86,811. For the year 1922 the total car mileage was 1,677,457, and the power cost for that year was \$69,798. For the first ten months of 1923 our total car mileage was 1,447,062, and the power cost was \$59,321, for the Beaver Valley Traction Company and the Pittsburgh & Beaver Street Railway, which was \$8,012 less than power for the corresponding ten months of the previous year. This is due to the fact that for the past several months we have been operating some of our eighteen-hour per day runs with one-man cars, while two-man cars were operated on them last year.

#### NATURE OF MECHANICAL TROUBLES EXPERIENCED

The mechanical troubles we have had with the single-truck one-man cars are as follows: The body pedestal springs have broken and we have been compelled to increase the size of the journal spring from  $\frac{3}{4}$  in. to  $\frac{7}{8}$  in. and the body springs from  $\frac{5}{8}$  to  $\frac{3}{4}$  in. Any further increase would make a rougher riding car. One broken truck frame near the yoke is the extent of our truck trouble. We have had difficulty with air line to braking cylinder cracking, due to movement or breathing of cylinder. On each car two to four main cross-members of the underframing have broken. We have increased the size of these I-beams from  $5\frac{1}{2}$  to  $7\frac{1}{2}$  lb. and we believe this will correct that trouble. All these troubles are due to overloading. Based upon our experience, we would recommend that the weight of the standard single-truck car be increased slightly, at least enough to take care of the strengthening of the I-beams and underframing. We would also recommend the use of a 16-ft. air compressor, two fare boxes for short fast-schedule runs, the installation of motormen's stools on converted cars, and in order to keep tobacco juice off the steps we would recommend the equipping of all cars with trapdoor cuspidor flush with floor, headlights of greater efficiency than those with which these cars are generally equipped, and proper curtain device to shut off the glare of the car lights from the operator's windows.

#### CHANGES MADE

We removed the folding seats near the doors because passengers insisted upon sitting by the operator and block-

ing the doorway. To give much needed aisle space at the entrance we have changed the first seat inside the door from a cross to a longitudinal seat. The sand boxes were all moved forward one seat ( $28\frac{1}{2}$  in.) to get away from wheel wash, which change has eliminated the trouble caused by sand pipe clogging.

We have had no trouble with the operation of these cars through snow except with the fender tripping device. During at least one snow storm it became necessary to tie up all fenders on account of the snow. We are now about to place hand straps in all our standard Birney cars.

On our converted cars we took out the Peter Smith heaters and put in 12,000-watt electric heaters in addition to a 1,000-watt heater placed in each cab; the heaters in the interior of the car are controlled by thermostats.

Based upon our experience, we believe that provided the weight of the double-truck car is not too great and that the body and trucks have not outlived their period of usefulness, it is far better for the comfort and convenience of the passenger to convert a good double-truck car to a one-man car than it is to purchase single-truck one-man cars. The total cost for converting our double-truck cars (which included new seats, electric heaters, all the Birney safety features, general overhauling, and painting) was \$1,915 per car.

We find that most of the floors on the ten cars put into service in 1920 will have to be renewed during the year 1924. These are single floor cars.

In conclusion, we do not believe that the operator of a one-man car is overworked due to the performance of the functions of both motorman and conductor, but of course there is an increase in mental functions which should promote efficiency of the operator as regards safety and otherwise, for an idle man is an unsafe man.

We believe that in communities under, say, 75,000, the one-man car is the one thing that will help most to save the street railway facilities to the community served. In communities over 75,000 as a general proposition each one-man car substituted for a two-man car will add just that much to the welfare of the car rider and the employees in general and be indicative of good management. The saving effected might be applied to improvement of the conditions of track, overhead line, car equipment, or a wage increase or even a dividend.

We believe that if the cars are of the double-truck type, equipped with properly spaced upholstered seats, and if other consideration is given to the comfort of the passenger, and if the company's public relations are in good order, and if the trainmen and councils are properly sold on the idea of one-man operation and acquainted with the necessity thereof, there will be little if any complaint in any community where this operation is tried.



## Auto Buses and Street Railways\*

Legal Status in Pennsylvania Defined—Policy of the Commission Is Toward Supplementary Rather than Competitive Service

BY J. F. SHRADER

Attorney American Electric Power Company

THE public utility laws of the several states vary so much in their phraseology, scope and purpose that the conclusions reached in one state are apt to have, from a legal aspect, little weight as authority in another state. For example, in a number of states, including Illinois, the very important competitive service to the street railway of the taxicab has been held to lie outside the regulatory powers delegated to their commissions. In Pennsylvania, as is well known, certificates of public convenience are required for call and demand automobile service, and our commission has placed restrictions upon such service under certain circumstances effectively eliminating competition with existing facilities.<sup>1</sup> This discussion will be confined to the policies and conclusions arrived at under existing laws of the Commonwealth of Pennsylvania.

Strictly speaking, every transportation facility which is capable of depriving a carrier of a fare is in competition with that carrier. Such competition extends conceivably from the roller skate to the airplane and includes the bicycle, the horse-drawn vehicle and privately owned and privately operated automobiles, as well as jitneys, taxicabs and motor buses. Transportation which is purely private, although competitive, cannot be governmentally restricted or controlled in the interests of rail carriers in the furtherance of public convenience and necessity. Chairman Ainey of our commission as early as 1916 announced, with possibly a word of warning, the principle which must control the commission, using this language:

... losses which this or other railway companies may sustain cannot be weighed against the convenience of the public if at any time a better or more convenient form of transportation than that furnished by the street railway companies is offered.<sup>2</sup>

Thus the acceptability of the service to the riders, or a considerable number of them, is in the last analysis the governing factor and will eventually control the extent to which the existing carriers will be subject to competition, private and public. In the measure that the street railways may be able to influence this decision by superiority, convenience, completeness and cheapness of service, they will accomplish more toward elimination of competition than the government could possibly accomplish, because the railways can, while the government cannot, reach and affect strictly private transportation facilities.

The Public Service Commission of

Pennsylvania has adopted a non-competitive policy which has been judicially approved. This, of course, only extends to the carriers within the jurisdiction of the commission. Broadly speaking, these are common carriers for profit as distinguished from purely private carriers who may operate either gratuitously or for profit. In order to understand to what extent this protective policy of the commission may be anticipated, it is necessary to know exactly where the commission and the courts have drawn the line between common carriers and private carriers. It will also enable those contemplating inauguration of auto bus service in conjunction with rail service to determine to what extent they may expect competition with the proposed bus service.

### COMMON CARRIER DEFINED

The public service company law<sup>3</sup> defines the relevant terms thus:

The term "Public Service Company" when used in this act includes all . . . street railway corporations . . . common carriers . . . and also all persons engaged for profit in the same kind of business.

The term "common carrier" as used in this act includes any and all common carriers, whether corporations or persons, engaged for profit in the conveyance of passengers or property, or both, between points within this Commonwealth.

Our commission has held that the word "common carrier" as used in this law is used in its broad sense as comprehending all that comes under the common law definition, and is not restricted to such carriers only as are named in the statute.<sup>4</sup> The question as to whether a given service falls within or outside the classification of a common carrier is a question of fact for the commission in the first instance.<sup>5</sup>

The Supreme Court of Pennsylvania in 1909, prior to the adoption of the public service company law, defined a common carrier thus:

Any one who holds himself out to the public as ready to undertake for hire or reward the transportation of goods from place to place, and so invites custom of the public, is, in the estimation of the law, a common carrier.<sup>6</sup>

A common carrier has also been briefly defined as "one who undertakes for hire to carry all persons indifferently who apply for passage." Whether a person is engaged in the business of a common carrier is not dependent upon the means employed for the carriage, fixed termini nor definite route. These are held to be but limitations which the carrier places upon himself beyond which he may not be compelled to go in the performance of the public service which he purposes to render.<sup>7</sup>

In approaching the question as to whether a particular service is or is not that of a common carrier, it has been held that it is immaterial what a man professes to do, or what he says he does not do, or what his charter authorizes him to do, but, rather, what does he do in fact.<sup>8</sup> He actually does at least two things; he holds himself out to the public as ready and willing to perform a transportation service, and he actually carries some one somewhere. Judicial decisions fix the former of these acts as the most important in determining the common carrier status. If he holds himself out as ready and willing to carry people indiscriminately as they apply, for hire, within the scope of his undertaking, either as to destination, numbers, route or method he has classified himself as a common carrier. After that he may actually confine his carriage, either voluntarily or by virtue of the exigencies of the situation, to particular classes of the public, such as employees of a particular industry, without affecting his status as a common carrier.<sup>9</sup>

This holding out or invitation of the patronage of the public may be done by public advertisement, signs upon vehicles, signs upon fences, cards for general circulation, or bills and tags used in the business.<sup>10</sup> It may be done by taking a stand in a public street or square and inviting the patronage of the public, either by sign upon the vehicles or by gesticulating to people as they pass by.<sup>11</sup> On the other hand, the keeper of a garage, who at his place of business hires motor cars upon individual bargains to those who come to him and apply, is not holding himself out indiscriminately in such a manner as to make him a common carrier.<sup>12</sup>

The law states that the carriage must be engaged in "for profit." "For profit" has been judicially construed as synonymous with "for reward" or "for hire." This excludes the case of all purely gratuitous carriage, or the case where the public is expressly excluded in the undertaking as well as in the fact of carriage. Thus it has been held that where a man confined his holding out and his actual service to five named persons, although he hauled them repeatedly and for hire, he was not a common carrier.<sup>13</sup> Likewise, upon this principle, I assume a vehicle jointly owned by a number of individuals and operated expressly and exclusively for the benefit of the owners, not for profit, and from which the public is actually excluded, would be held not to be a common carrier. The commission and the courts may be depended upon to discover and control any competitive service which, while in fact that of a common carrier, is conducted in a manner

<sup>1</sup>Taxicab Co. vs. Kutz, 241 U. S., 252.

<sup>2</sup>Howard vs. Public Service Commission, 77 Superior, 188.

<sup>3</sup>Lloyd vs. Haugh, *supra*.

<sup>4</sup>Railway Co. vs. Greco, *supra*.

<sup>5</sup>Piercy vs. P. S. C., 73 Superior, at page 214 (1919); Oppenheimer vs. Md. Casualty Co., 70 Superior, 382; Terminal Cab Co. vs. Dist. of C., 241 U. S., 262.

<sup>6</sup>Towers vs. Wildason (Md.), 109 Atl., 471.

<sup>7</sup>Act of July 26, 1913, Pamphlet Laws, page 1374.

<sup>8</sup>Seranton Railway vs. Walsh, P. U. R. 1916 D, page 18.

<sup>9</sup>Allegheny V. R. Co. vs. Greco, P. U. R. 1917 A, page 723.

<sup>10</sup>Lloyd vs. Transfer Co., 223 Pa., 148.

<sup>11</sup>Railway Co. vs. Greco, *supra*.

\*Abstract of paper presented at the annual convention of the Pennsylvania Street Railway Association, Harrisburg, Pa., Dec. 4, 1923.

<sup>1</sup>In re John Beville, P. U. R. 1923 C, page 294.

<sup>2</sup>Allegheny Valley Street Railway vs. Greco, P. U. R. 1917 A, page 723.



calculated to make it appear like that of a private carrier.

An attempt was made in this state by a carrier to evade classification as a common carrier by limiting his passengers to current members of a "Community Auto Club." The qualification for membership in this club was the payment of \$1, upon the payment of which the members received seven tickets as a gift, each of which was good for one ride. After these seven tickets were used the members could continue to ride by the payment of 15 cents cash fare or the purchase of additional tickets at the rate of seven for \$1. This carrier contended he was not subject to the jurisdiction of the Public Service Commission upon the ground that all his passengers were carried under a special arrangement upon individual bargain. The commission found this special arrangement to be in the nature of a subterfuge, designated the service as that of a common carrier and issued a cease and desist order.<sup>14</sup>

It would seem that the practice of an automobile operator of rendering a service of carriage without exacting or demanding any particular fare but depending upon such reward as the passengers may see fit to give him, and where he holds himself out as ready and willing to carry all who apply for transportation, should likewise be held to be a mere subterfuge and effort to make an undertaking actually engaged in for hire or for profit or reward appear to be a gratuitous service.

#### CONVENIENCE AND NECESSITY DEFINED

The convenience and necessity of automobile carriage supplemental to the service of established rail carriers has, however, been repeatedly recognized by the Public Service Commission in this state and certificates for such service granted. We have endeavored to point out that above and beyond all power of the commission, although disposed to do so within proper limits, to restrict or control or direct the course of development of public carriage, there is the final factor of public demand which must prevail. This demand, sufficiently asserted, becomes a public necessity. It is not what the Legislature or the commission or the street railways or any individual thinks should be adequately sufficient service, but rather what a sufficient number of individuals in the community want and are willing to pay enough for to make operation possible that will finally determine the manner by and extent to which existing service facilities must be supplemented or extended. There is in every community in normal times a drift or trend of development and a shifting of population to new locations. Every new settlement must have its beginning and normally its growth is extended over a considerable period of time. There must be a period of time before it reaches a size which would warrant rail extensions when the residents, so far

as the rail service is concerned, are actually inconvenienced in some degree in their transportation. The public demands supplemental service and in its present frame of mind finds auto-bus transportation satisfactory and convenient.

#### SUPPLEMENTARY OR COMPETITIVE SERVICE

The question arises whether the public convenience and necessity may be better served by permitting such supplemental service to be conducted by independent carriers or by carriers in some manner controlled by the street railway companies. The Public Utilities Commission of the District of Columbia in discussing this question has said:

In our opinion, there is a legitimate field for bus service, but this does not lie in the multiplication of lines or of vehicles reaching the heart of the city. It lies rather in providing service in extension of the street car lines into territory so thinly settled as not to justify the large investment necessary for street railway service. The bus lines should be feeders. They should create business and not rob the street railways of the just reward due their heavy investments for the public benefit. An exception to this principle arises when the existing street railway service proves to be inadequate and, for reasons either physical or financial, additional street railway lines cannot be created. In such cases, even in thickly settled territory, the obvious recourse is to bus lines; but, in the absence of legal objections, the best interests of the public will be promoted by causing such lines to be owned and operated by the street railway companies and to co-ordinate them with the car lines so that transfer privileges and other desirable joint relations may result.<sup>15</sup>

The Pennsylvania Commission, in approving the application for incorporation of an auto bus company organized by an electric railway company and in issuing a certificate of public convenience for operation of such auto bus service in a field where at least forty-five jitney operators were operating under certificates, said:

At best, and under the most exacting conditions of regulations, jitney service of the character of that rendered in Chester is transitory and unstable. Automobiles are usually employed which are not equipped as they should be for public conveyance; it is difficult to the point of impossibility to operate them with the regularity and safety or with the service efficiency of vehicles designed and constructed especially for public passenger service, and in many respects that are obvious passenger auto bus vehicles, properly equipped, are preferable and superior to the types of cars used as jitneys over city streets and public highways. The elements of greater responsibility for the rendition of adequate public service by an incorporated company, and of the permanence of such service, are also important factors.

And further:

Such extensions as may be necessary adequately to provide for the requirements of the city and adjoining territory will have to be assumed by the operating company as part of its public obligation. Properly rendered, auto bus service as an addition and supplement to existing trolley facilities, and operating in conjunction therewith, should afford more adequate and reliable transportation facilities than the city of Chester has heretofore possessed.<sup>16</sup>

Subsequently the approval of the incorporation and beginning of the exercise of the right to operate auto buses in the same territory was sought by an independent applicant. The bus company, incorporated by the traction company, had not yet obtained the necessary

license from the municipality, while the new applicant had such license. The Public Service Commission refused to approve the incorporation of the new company and stated:

The commission is still of the opinion that the contemplated auto-bus service can best be rendered as a supplement to the existing trolley service, and can best be operated in conjunction with the trolley system.<sup>17</sup>

Our commission seems therefore to have adopted a policy favoring the operation of automobile service supplemental to trolley service by companies identified with the street railway companies. In addition to the likelihood that such operation will better serve the convenience and necessity of the public, from the viewpoint of the street railways themselves, distinct advantages would seem to result therefrom. Among other advantages which may suggest themselves to practical street railway men I would suggest the following:

1. It prevents outsiders from acquiring prior rights in territory naturally to be served by the street railway company. It is possible that such prior rights may at some future time arise to embarrass or impede the street railway company, either in the extension of its street railway lines or in the inauguration of supplemental motor bus service. The superiority of the motor bus over the transitory and unstable jitney is recognized, and this means that the motor bus will in all likelihood generally supplant the jitney. The motor bus involves a larger initial investment and will therefore in all likelihood be identified with more responsible and dependable owners. Such owners may not be so readily eliminated from the field by the buses controlled by the street railway companies.

2. Motor bus service so conducted identifies itself with the street railway service, as a part of it, and thus is a traffic feeder for the trolley cars at the same time that it tends to create a complete, satisfactory and acceptable transportation service, all of which, as has been previously pointed out, contributes fundamentally to the permanence and value of street railway investment.

3. It is well known that, despite the diligence of established carriers and of the Public Service Commission, irresponsible automobile operators do as a matter of fact, to some extent at least, compete with the rail carriers, either by failure to obtain certificates of convenience or by persistently exceeding the rights granted them. Such competition would be eliminated by motor buses operated in connection with the street railways.

4. It would prevent the diversion of traffic from the rail carriers, naturally and geographically entitled to it, to other carriers.

5. It would furnish a more responsible and substantial and unified automobile service.

6. It may at some future time enable street railway companies by the exten-

<sup>15</sup>In re Washington Rapid Transit Co., P. U. R. 1923 E, page 323.

<sup>16</sup>In re Southern Pennsylvania Bus Company, Application Docket, Pa., No. 6720, 1922.

<sup>14</sup>Lehigh Valley Transit Co. vs. Bauder, P. U. R. 1921 D, 404.

<sup>17</sup>In re Chester Auto Bus Line, P. U. R. 1923 E, page 384.



sion of the auto-bus service to abandon unprofitable branches or lines without objection upon the part of any one.

7. It will insure the fixing of automobile transportation rates upon a scientific basis and to this extent eliminate an unfair and unfavorable comparison of rates as between motor bus and street railway carriers.

The increasing demand upon the part of the riding public for automobile transportation cannot, in my judgment, be safely ignored by the street railway companies, and it may possibly be that the motive of self-preservation may eventually force all street railway companies into greatly enlarged supplemental auto-bus transportation.

fully protected at all times. From the nature of the obligation which rests upon the utility, the provision of such a fund is as much a part of the utility's property as any physical unit in it, and when provision is made therefor it renders the immediate physical conditions of the property relatively unimportant for the reason that whatever may have gone from the physical property through use is represented in a ready financial ability to retire or replace when necessary.

It is true that the consumer pays only for the commodity which he has received in the way of service, but it must not be overlooked that under regulation under the ordinary and usual conditions the concern supplying the commodity is in fact a monopoly enjoying the exclusive privilege and right of engaging in the business undertaking, and under usual and ordinary conditions the consumer is entirely dependent upon one concern for the supply of that commodity which, in many instances, is practically a necessity. He therefore looks to the regulating authority to see that all reasonable measures are taken to insure in so far as possible a continuation of the supply of the commodity and the continued rendition of uninterrupted and unimpaired service.

#### THE OKLAHOMA ORDER

These considerations induced the Oklahoma commission in 1921 to conduct some hearings on the subject and in 1923 it issued an order based largely on that used by the Indiana Commission in several specific rate orders made by it. A summary of the material provisions of the Oklahoma order is as follows:

"1. That each and every public utility company operating within the State of Oklahoma shall, on and after Feb. 1, 1923, create, provide and maintain separately a depreciation reserve fund, into which shall be placed all the moneys allowed and earned for depreciation.

"2. No public utility company shall be permitted to pay out in dividends any sum in excess of 8 per cent of the record value of its property used and useful in rendering service until after the full amount of allowed depreciation shall be paid into the depreciation reserve fund of such company.

"3. That said fund shall be handled and accounted for entirely separate and apart from the other ordinary funds of such utilities.

"4. That such depreciation reserve shall be held strictly in said fund and shall only be used in the following way and for the following purposes, to wit:

"(a) For meeting depreciation.

"(b) For investment in government or other high grade listed securities to be held strictly in said fund, and which shall return to said fund not less than 4 per cent per annum, or

"(c) Any such utility may borrow from its depreciation reserve fund for a period not to exceed three years an amount equal to the cost of any new

## Accounting for Operating Expense and Depreciation

This Topic Considered in Report of Committee on Public Utility Rates at This Week's Convention of Railway and Utility Commissioners—  
Separate Fund Recommended for Depreciation Reserve

IN ITS report at the convention of the National Association of Railway & Utility Commissioners at Miami this week the committee on public utility rates said that previous reports of this committee have dealt with the fundamentals of rate making, such as valuation, depreciation and rate of return, and, as was pointed out in the report of the 1921 committee, valuation has received so much publicity that there has arisen the quite common view that valuation is an end in itself. The report at the Miami convention this week was given up largely to the subject of desirable regulations for the expenditure of a depreciation reserve fund, with some introductory references to the importance of accurate accounting of operating expense, to which attention had been called in the 1921 report. Thus, the report says that donations to educational and charitable institutions are not a proper charge for operating expenses. To allow them would be to make the ratepayer the real donor. In Alabama a federal judge, in a recent case, had allowed as an operating expense a contribution of \$500 by the utility to the campaign fund of a candidate for the City Commission where the utility is located. An appeal on this has been taken by the state commission.

While the committee considers legitimate advertising as unquestionably a proper item to be allowed as an operating expense, it points out that utility advertising managers are not infallible and are liable to error especially if no questions are asked and their mistakes are passed on to the rate payer. If regulation is to take the place of competition for public service corporations, then regulation, while not infringing upon management, must know that management is honest, efficient and economical.

#### RESERVE FOR DEPRECIATION

This section of the report was written by E. R. Hughes of the Oklahoma Public Service Commission. An abstract follows:

Much has been said and written within the past few years on the maintenance of what is commonly called "the reserve for depreciation." Some have taken the position that such a

reserve is entirely unnecessary and therefore unjustified. Others, who have recognized the necessity for such a fund, have held that it may be used by the utility affected in such a way and for such purposes as the utility may see fit to put it. A number of the state commissions, including that in Oklahoma, have taken the position that any amount allowed for depreciation should be maintained as a separate fund and strictly accounted for, in so far as its use is concerned.

It has long been recognized that some amount should be allowed for the gradual waste of property used and useful in the rendition of a public service. This principle was enunciated very clearly by the Supreme Court of the United States in the Knoxville water case, and it has been set forth in numerous textbooks on the subject. The necessity for the creation of such fund and the allowance in the fixing of a rate of an amount sufficient to take care of the gradual wasting away of the property used in the public service being conceded, the most important consideration then is: How shall the fund so created be treated by the commission with respect to its maintenance and use?

It should go without saying, in the opinion of the writer, that when a public utility engages in the business of serving the public, it assumes a responsibility for keeping its means of service in such condition that the service will not be interrupted or impaired. Its property cannot be removed and established elsewhere so long as it is needed in the service being rendered, and it cannot be permitted to run down or get out of repair to a point where service is affected.

For the reason that it is not possible to meet the factor of depreciation from day to day or from year to year, the full serviceability of the utility's property can only be maintained where there is provision made against the time when retirement or replacement can be made. This provision must be financial in its nature and must be reasonably liquid so that its use when needed will not be unduly delayed. It must be reasonably adequate in amount, and should be, as has been repeatedly asserted by various state commissions,



construction, extension or addition to the property—items chargeable to capital account—but as security to said fund there shall be deposited in same the utility's own bonds or the notes of such utility bearing interest at the rate of not less than 5 per cent per annum, which interest shall accrue to said fund.

"5. In handling such fund the utility will be held strictly accountable for its safe investment, for proper administration and accounting. Said accounting shall be double entry with the asset account designated 'depreciation fund' and the liability account designated 'depreciation reserve.'

"6. Each annual report filed by any public utility company shall set out clearly the exact conditions of said fund, showing clearly all additions to or deductions from this fund during the year covered by such report, the balance of said fund at the close of the year, and how invested."

The provisions of this order are not so drastic as many of the commissions of the United States have seen fit to adopt in connection with depreciation reserve requirements. It was sought to make the order sufficiently elastic and broad to cover all classes of public utilities, as well as to meet the different and varying conditions under which the different utilities were operated.

The great difficulty which confronts a regulating commission in this matter is usually the fact that after an allowance has been made, in the fixing of a rate for depreciation, in addition to the amount allowed at interest upon the investment, a great many utilities have taken the amount allowed as depreciation and capitalized it in property, to be used in connection with the service rendered, or have paid out the amount so earned in the way of dividends to the stockholders. The result of this practice is that when the time arrives when a continuance of public service depends upon replacement of property, used in the service, that such utility then applies to its commission for an additional rate based upon that necessity. The patron of the utility, having once paid into the coffers of the company, is again required to pay in the way of an advanced rate for that for which he has already paid once.

This question has been considered in numerous cases by commissions in the United States and the position of the Oklahoma Commission is in line with the decision of the Supreme Court in *Railroad Commissioners vs. Cumberland Telephone & Telegraph Company*, 212 U. S., 414, where the court, after saying that money collected for depreciation should not be so used as to add to the capital account, pointed out that this was not a case where there were surplus earnings after providing for depreciation fund, and the separate earnings were invested in extensions and additions. This distinction is a very important one to be remembered by the various commissions. In the *Cumberland* case also, the court declared that the burden of proof, after showing where the depreciation reserve fund was

expended, rests upon the utility and not upon the commission.

In conclusion, the commissions of the country should closely scrutinize the operating conditions of the utilities regulated by them with a view to seeing that revenue paid into the treasury of the company for the purpose of guaranteeing continued rendition of service is not dissipated by the paying of exorbitant dividends and is not cap-

italized without a strict account of the fund raised by this method by the utility.

The full committee on public utility rates, rendering this report, was Frank D. Morgan, Alabama, chairman; E. R. Hughes, Oklahoma; A. A. Betts, Arizona; J. M. Thompson, Idaho; Henry C. Atwill, Massachusetts; William J. Smith, Illinois, and Porter Dunlap, Tennessee.

## Utility Policies Discussed

### Association of Railway and Utility Commissioners Consider Regulatory Measures at the Miami Convention

THIS week the National Association of Railway & Utilities Commissioners is holding its annual meeting in Miami, Fla., and an extended program of addresses and committee reports is under consideration. Those from whom addresses are scheduled include representatives of the American Electric Railway Association, National Electric Light Association, American Gas Association, American Railway Association and Interstate Commerce Commission. A few of the committee reports have been received in time for brief reference in this issue. One on public utility rates is printed in rather extended abstract in another column. Abstracts of some of the other reports follow:

The report of the committee on service of public utility companies was devoted largely to a consideration of the New Jersey situation of last summer, when there was no trolley service for fifty-one days in 142 municipalities, representing a total population of more than 1,000,000 inhabitants. According to the report, the situation which began with the strike of the employees became a strike against the public on the part of the company, which adopted a policy of "Agree to our plan or no service will be offered." Legal measures under which the company was required to begin service are described. The report, in defending the position of the court of equity of New Jersey in the case, cites the possible case of a water company which desired to increase its rates or relieve itself of other economic burdens and announced that it would withdraw all water service until the public officers and the public at large consented to its plans. But little imagination is needed, the report says, to point out the disaster to any large city if its water supply were cut off entirely for a period of fifty-one days. The report continues:

The law should never be without a remedy under such conditions, and that remedy should be one that should immediately be effective and should not be surrounded by any of the ordinary delays incident to legal procedure.

The action of the company in New Jersey in withdrawing its service in its entirety was at once a challenge to the sovereignty of the state. Its success would have defeated all regulation. It would have nullified all laws and the supreme power of the state over its citizens and corporations. It would have pointed out to all utility companies that relief as to rates and to any other economic condition could be brought about by any company

by simply withdrawing its entire service until its terms were met by the public. We express the doubt that nowhere since regulation became a part of our political institutions has any great public utility attempted to establish such a precedent.

In its recommendations the committee declares that in every state where regulation is effective steps should be taken and a proper legal machinery be provided to prevent a situation of this kind ever becoming effective, and that the franchise obligation to serve shall always be construed to mean continuous and uninterrupted service. The report was submitted by J. J. Divine, chairman of the West Virginia Commission.

### GRADE CROSSINGS

The report of the committee on grade crossings and trespassing on railroads contains a table showing the apportionment of the cost of eliminating grade crossings in the different states, when fixed by statute. The report declares that the time has come when in some form the automobilist should specifically be required to share in the expense which has usually been divided between the railroad and the public. The proportion suggested is 40 per cent for the public, 40 per cent for the railroads and 20 per cent for the automobilist, and the suggestion is made that this 20 per cent might possibly be obtained by diverting the fines imposed upon automobilists for reckless driving into a fund for this purpose. The report, which was submitted by W. T. Gunnison, New Hampshire, chairman, also suggests that to compel automobilists to slow down at crossings obstructions might be placed in the highway.

### Central Traffic Men Meet

AT A meeting of the Central Electric Traffic Association in Cleveland, on Nov. 21, the committee on prevention of freight claims recommended that all waybills covering inter-line shipments be placed in a large waybill envelope and carried outside the car rather than inside the car with the shipment.

The association also decided to advertise the lines of the Central Electric Railway Association territory in the *Traffic World*, the amount of space to be contracted for depending on the number of companies which are willing to participate in this advertising.



## Pennsylvania Men Discuss Bus and One-Man Cars

TWO very practical papers, one on the use of motor buses by street railways, by J. F. Shrader, and the other on one-man car operation, by W. H. Boyce, were the features of the annual meeting of the Pennsylvania Street Railway Association held at Harrisburg, Pa., on Dec. 4. The convention was limited to an afternoon and evening session only, but the attendance was larger than usual, being about 100 altogether. In the absence of President C. B. Fairchild, the meeting was presided over by Vice-President F. R. Phillips, Pittsburgh Railways.

The electric railway men were greeted by Governor Pinchot, who said that he was glad to say that the street railways had recognized their duty to the public, which cannot be said of all other public utilities, as, for example, the anthracite industry.

The papers presented by Mr. Shrader and Mr. Boyce appear elsewhere in this issue. John P. Dohoney of the Pennsylvania Public Service Commission sent a brief communication to the convention on the subject of safety, in which he commented that in a period of ten years there had been only four street car passengers killed as a result of crossing collisions in Pennsylvania. He said that this marvelous record reflects the precaution that is exercised in crossing movements and is made more notable by the fact that trolleys are operated over 611 crossings, 310 of which are on main lines.

Major Otto Rau addressed the meeting briefly on "The Giant Power Survey." Major J. S. S. Richardson, director of the Pennsylvania Public Service Information Committee, presented a paper reviewing the history of the development of the state information committees and outlining the plan of their work and the accomplishments of the Pennsylvania committee in its brief existence.

The convention passed a resolution indorsing the tax reduction plan of Secretary Mellon. Further business was the decision to appoint a committee to investigate the possibility of legislation to permit railways to operate trackless vehicles under their present charters. The executive committee was authorized also to appoint a permanent committee to co-operate on the giant power survey.

The new officers elected for the ensuing year were as follows:

President, F. R. Phillips, acting general manager Pittsburgh Railways; vice-president, W. S. Bell, general manager Wilkes-Barre Railway; secretary and treasurer, H. M. Stine, Harrisburg, Pa. The executive committee will consist of Messrs. Phillips and Bell and Gordon Campbell, C. L. S. Tingley, Thomas Cooper, C. F. Crane, and C. B. Fairchild.

At the evening banquet short speeches were made by several people.

Edward E. Beidleman, former Lieutenant-Governor of Pennsylvania, expressed the belief that the pioneer investor deserves a greater return on his money than the man who takes no chances, and that new capital cannot be secured for future pioneering enterprises if the return is too rigidly limited. In other words, he disapproved of the limitation of railway earnings to the so-called fair return of about 6 per cent.

### Kentucky Utilities Meeting Postponed

THE annual meeting of the Kentucky Association of Public Utilities, scheduled for Dec. 13 and 14 has been postponed to Jan. 10 and 11, 1924, according to an announcement from Edward F. Kelly, secretary.

## American Association News

### Midyear Meeting Program

AT THE meeting of the committee on subjects and meetings of the American Association, held in New York on Nov. 27, it was decided to make the city traffic problem the topic for the morning session of the midyear meeting, which will be held in St. Louis, Mo., on March 4, at the Chase Hotel. Traffic will be discussed from various standpoints including those of municipal authorities, motor vehicle interests and electric railways, with the idea of co-ordinating all interests in working toward better conditions.

It was decided to devote the afternoon session to the subject of finance, with three principal speakers, one a banker, one an economist and the third a holding company representative.

There will be the usual banquet in the evening with a speaker of national prominence closely associated with the administration in Washington, and one other speaker, of public prominence.

The members of the subjects and meetings committee present were Chairman Frank R. Coates, Gen. George H. Harries, Harlow C. Clark, J. K. Punderford, F. W. Doolittle, W. H. Hyland, Cornell S. Hawley, Harry L. Brown, E. H. Reed, representing E. M. White, and J. W. Welsh.

### Extra Mail Pay

THE Post Office Department in circular letter R-A-514, dated Nov. 23, issued by the division of railway adjustment, office of second assistant postmaster-general advises that the department will pay for emergency mail service duly employed on and after Dec. 1, 1923, as supplied by the urban and interurban electric railways. L. H.

Palmer, chairman of the committee on mail pay, interprets this to be largely to take care of the Christmas business, although it would apply at any time of the year when for some exceptional reason excess mail moves.

### Heavy Electric Traction

THE first meeting of the heavy electric traction committee of the Engineering Association was held at New York Dec. 6. It was voted to revise and bring up to date the bibliography of heavy traction and electrification data, rearranging it in such form as to be more readily accessible. It was proposed to limit the number of periodicals indexed to approximately twenty-five of the leading American and foreign journals. The subject was referred for further study to a sub-committee, of which H. F. Brown is chairman.

The subject of self-propelled cars and storage battery locomotives was discussed. It was felt that information on this topic would be of importance not only to the steam railroads, but also to a certain number of interurbans which might require extensions in territory where an electric line is not justified. It was the sense of the committee that the topic should include self-propelled locomotives as well as motor cars. The subject was referred to a sub-committee, J. H. Davis chairman.

The subject of articulated trains was referred to a sub-committee headed by J. J. Sinclair.

There was some discussion regarding the subject of couplers for train service. The entire matter, including the proposed manner of treatment, was referred to a sub-committee, with A. H. Daus as chairman.

Those present at the meeting were J. C. Davidson, chairman; A. H. Armstrong, A. H. Candee for H. W. Cope, H. F. Brown, J. H. Davis, E. P. Chase for J. V. B. Duer, Norman Litchfield, L. S. Wells, J. J. Sinclair, A. H. Daus and Morris Buck.

### Special Reports Available

THE Bureau of Information and Service of the American Electric Railway Association announces that the following special reports have been prepared and are available to member companies in good standing upon request:

*Trend of Material Prices:* A new edition of the association's compilation bringing down to date the trend of prices of materials used by electric railways as furnished by manufacturers.

*One-Man Car Operation:* A summary of the replies of over 200 companies to the association's questionnaire, showing the number and types of one-man cars operated, fare collection methods, accident record and the attitude of the public toward operation with one man.

*Accident Statistics of Electric Railways:* Comparative record of 113 companies for the years 1920, 1921 and 1922, showing number and cost of accidents, causes of the mere frequent types of accidents and comparisons on unit basis to show the general progress in accident prevention.

In addition to the above, supplements to the Wage Bulletin, Fare Bulletin and Cost of Living Studies have been prepared bringing them down to date.

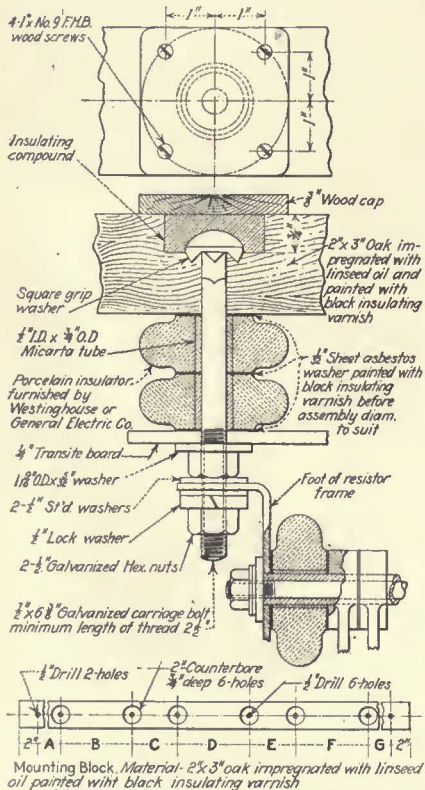


# Maintenance of Equipment

## Improved Type of Resistor Mounting

BY H. S. WILLIAMS  
Assistant Superintendent of Equipment,  
Department of Street Railways,  
Detroit

LAST season so much trouble was experienced with comparatively new equipment on the lines of the Detroit Municipal Railway, due to



Sections and Plans of Method of Mounting Resistors

grounded resistors, that radical steps had to be taken to correct the inherent weakness of the method employed in mounting. This original method was the familiar scheme using two porcelain insulators and insulating sleeves at each supporting bolt, which plan is recommended by the large manufacturing companies. This scheme has proved unsatisfactory in that the leakage distances are too small. Of course, this trouble could be minimized if all the porcelain insulators were kept clean. This however, is impracticable because of the added cost of such care and the

fact that the upper porcelain is often very inaccessible.

The accompanying illustration shows the improved plan of mountings which has been adopted. This is essentially a combination of the method used many years ago with the latest recommended practice, but with added refinements. The mounting block which fastens to the car underframe is made as long as convenient. This is of oak, and, after fitting and drilling, it is prepared after the principles used in dipping and baking railway armatures. It is baked in an oven, dipped in linseed oil or insulating varnish, baked again and given a final coat of black air-drying varnish. This gives it a lasting moisture-proof character.

The next step is the application of the grid mounting bolts. These are galvanized carriage bolts countersunk in the mounting blocks, and the countersink is filled with a special insulating compound so as to prevent any leakage at this point due to moisture. This compound is further guarded by an impregnated wood cap. Definitely to avoid trouble from the turning of the carriage bolt head in subsequent maintenance, a special square grip washer is used.

Insulating sleeves and porcelain insulators are then applied. With two porcelains used together the leakage distance is increased so that no matter how much alkali, dust and moisture is present they will stand up. The transite heat guard is then applied and bolted in place. Up to this point the installation is considered permanent, which explains the extra precautions used as to detail. It is believed that with this plan carefully followed, the slight added expense is fully warranted and that resistance grounding will be entirely overcome. All wires to the resistance have the insulation removed from the connectors back to the top side of the transite board and the bare wire is tinned thoroughly. The same porcelains used in mounting are being tried out at the ends of the resistance grids in order to increase leakage distance at this point. An opinion on its efficiency cannot be given yet.

## Old Rail Used to Support Car Stop Sign\*

DURING the recent war the Northern Texas Traction Company, Fort Worth, inaugurated the skip-stop system on its city lines. It was therefore necessary to designate each stop by a car-stop sign. For this purpose was used a metal plate fastened to a vertical post made of an old rail sunk into the sidewalk.



All Car Stops in Fort Worth Are Marked by Signs of This Type

On all lines on which front-entrance one-man cars were used these posts were placed at the curb in such a position that when the car came to a stop the car-stop sign would be exactly opposite the front door. Similarly, on lines where rear-entrance cars were used the posts were located further from the street corner, so that the sign would be opposite the rear-entrance door of the car.

Installation of these signs has resulted in speeding up the service and a lessening of confusion among the boarding and alighting passengers. When additional stops were installed new signs were erected at all of the

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



new stopping points. Whenever double-truck two-man cars, with rear entrance, are replaced on any line by one-man front-entrance cars the car-stop signs are moved so that they will be in the proper position for the new type car.

### New Cable Suspension Reduces Vibration

BY G. H. MCKELWAY

Engineer of Distribution Brooklyn-Manhattan Transit Corporation

A NEW form of suspension for high-tension triplex lead-covered cables has been worked out in Brooklyn to reduce the vibration where the cable is suspended from the elevated structure. In a number of places cable of this type is used where there is no underground conduit, and occasionally cables are run overhead on pole lines.

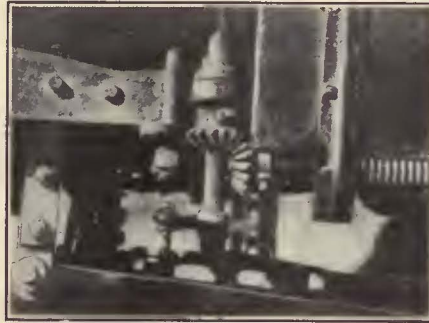
Originally the practice was to hang the cable directly from a messenger wire, which in turn was attached to the structure. The connection between the messenger wire and the cable was made by marline instead of by metal clips, since the elevated structure was used as a part of the return circuit. It was considered undesirable to permit any current to flow along the sheath of the cable, as this might cause damage by electrolysis. Some trouble was experienced due to cracking of the lead sheath, caused by vibration of the elevated structure whenever a train passed.

An improved method of construction was adopted to remedy the difficulty. A suspension wire is attached by U-clamps, which run through the flanges of light I-beams bolted to the girders. A second messenger wire is hung from this suspension wire by U-bolts attached at intervals of approximately 10 ft. The lead cable is suspended from the lower messenger by marline, the wrappings of marline being spaced 1 ft. apart.

Steady braces are provided on curves where there is danger of the cable being pulled against the elevated structure. These consist of pieces of strap iron bolted both to the girder and the lower messenger wire. This improved method of suspension has reduced the troubles from cracking of the lead sheaths considerably. Vibration is not entirely eliminated, but by careful inspection at frequent intervals cracks can be located and repairs made before moisture can enter to damage the insulation.

### Bevel Gears Improve Door Operation\*

THE Northern Texas Traction Company, Fort Worth, has found the use of bevel gears in place of toggles and rods for door and step operation to be a great improvement. These gears are installed on the lower end of the door rod, as shown



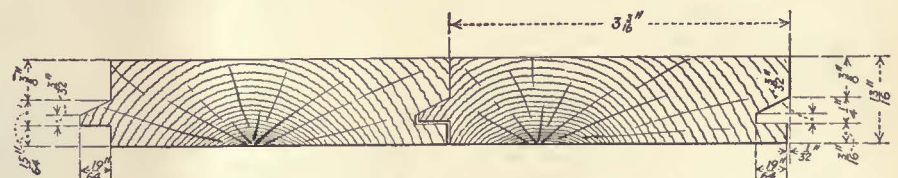
This Bevel Gear Arrangement Has Given Satisfaction on the Cars of the Northern Texas Traction Company

in the accompanying illustration. Their use reduces the amount of door and step rigging by half and makes it possible to adjust the mechanism with a single movement. Door and step trouble has been greatly reduced, and the operation from a transportation standpoint is much more satisfactory than with the older type apparatus.

### Long Wear Platform Flooring

THE Chicago Surface Lines recently made a careful investigation of the construction of platform floors on its cars for the purpose of reducing maintenance costs.

These floors have heretofore been made of single 1 1/8-in. hard maple boards, 3 1/4 in. wide. It was found that it often became necessary to renew flooring because of the splinter-



Special Tongue and Groove Arrangement for Increasing Life of Flooring

ing of the boards at the tongue and groove joint as the upper surface became worn. In many cases the floor still had ample strength but was replaced on account of its poor appearance.

The arrangement shown in the accompanying drawing has been

adopted to increase the life of the flooring and also to avoid the unsightly appearance of open cracks. The tongue and groove are cut as near the lower surface as practicable, thus giving a wearing depth of 3/8 in. from the upper surface. The lower face of the tongue is cut almost at right angles to the edge of the board, while the upper face is sloped down at a sharp angle. Consequently when the flooring becomes worn down to the edge of the groove the resulting crack in the joint does not become unsightly until all of the useful life has been obtained.

### Emergency Valve Used as a Quick Release Valve\*

ONE of the principal advantages of the Birney car is its extremely rapid acceleration, and when a question of converting the large double-truck cars of the El Paso Electric Railway into one-man type came up, there were many who did not believe that they would be able to make the time with them, particularly during the rush hours. The air equipment on these cars was the Westinghouse SME with the "D" emergency valve. The release on this valve was very slow, and would not make for quick acceleration. The valve was studied with the idea of converting it into a quick-release type, with final success.

The emergency valve was left in its original place, the emergency line was removed and the emergency port leading to the bottom portion of the valve was plugged and the emergency valve taken out. The main reservoir line was left in its original position, the straight air line from the "D" emergency valve was connected to the brake cylinder line on the K-1 emergency valve.

By making this change, not only

was the quick acceleration obtained, but also much quicker brake action, thus obtaining more rapid operation and better conservation of equipment.

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



## New Equipment Available

### New Model Underfeed Stoker

THE Westinghouse Electric & Manufacturing Company announces the development of a new multiple retort underfeed stoker. This is sold in all the usual sizes and includes double and single dump

tively low for any condition. The damper frames are steel and cast iron set in the concrete floor of the wind box. The main and division dampers are made of steel plates with angles. Each damper has its control conveniently mounted in front of the stoker.

The new ash discharge device or



Interior View of Stoker Showing Ash Discharge Device

grates, also double and single roll ash discharge devices. A new development in positive control of the contour of the fuel bed has been added, also another new feature of this stoker is the agitating element. This provides a means of maintaining minimum loss due to combustible in the refuse. The experimental installation of this type of stoker in Minneapolis was treated at length in this paper, in the issue of Aug. 12, 1922, on page 221.

The movement of the secondary ram is counter to that of the main ram. The motion agitates the fuel beds as the rams approach and recede from each other, thus uniformly distributing the fuel. The secondary rams are actuated by connecting rods from the main ram. The travel of the individual or group of rams is varied in increments from no travel to full travel. The action of the agitating grate is provided by a steam or air cylinder controlled by a pilot valve mounted adjacent to the side furnace door.

The wind box is beneath the stoker and is exceptionally large. The dampers are rectangular and of large area, hence the air velocity through the damper frames is rela-

tively low for any condition. The damper frames are steel and cast iron set in the concrete floor of the wind box. The main and division dampers are made of steel plates with angles. Each damper has its control conveniently mounted in front of the stoker. The new ash discharge device or

clinker grinder which has been developed can be applied to any Westinghouse underfeed stoker. The construction provides for four walls which are relatively vertical, assuring positive discharge of the refuse into the deep pit, where the large rolls dispose of it. The front and rear walls are built of heavy sectionized cast-iron plates of uniform thickness. This provides for expansion and contraction without cracking. The large square forged-steel shafts are incased in heavy sectionized cast-iron rolls and are supported by massive bearings.

### Roller Pipe Cutting Machine

THE Geist Manufacturing Company, Waynesboro, Pa., has placed upon the market a high-production heavy-duty roller pipe cutter. The design of this machine embodies features which have eliminated certain weaknesses found in other machines of this type.

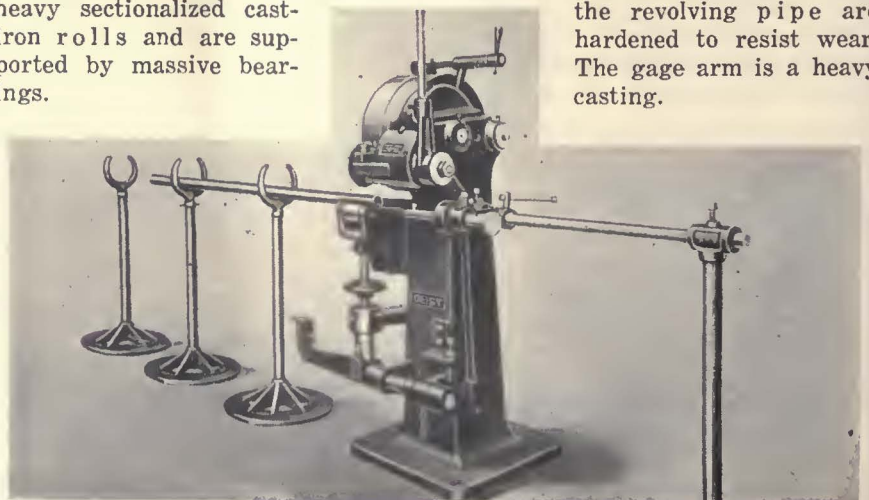
This machine is made in one size, having a range from  $\frac{1}{8}$  in. to 2 in. inclusive.

It is compact and rigid in design. All spindles and shafts are ground and run in bronze bushed bearings.

The cutter is made from tool steel and is heat-treated to give the maximum wearing qualities. It can be reground when dull. The cutter shaft bearing is provided with an adjustable cap on the cutter side for taking up any wear which may occur.

The rollers are made from tempered tool steel and are carried in roller bearings. The cage which supports the rollers is elevated to the cutter by a cam operated jointly by a pedal and a lever. The sliding surfaces of the cage are protected from scale and dirt by a flexible guard. The rollers are adjustable for the different sizes of pipe. This adjustment is obtained by means of a hand wheel located just below the rollers. The lever and the pedal can be positioned to suit the operator. Their movements are limited by an adjustable stop. A small cage of rollers for  $\frac{1}{8}$ -in. to  $\frac{3}{8}$ -in. pipe can be attached to the large cage without removing the regular rollers.

The length gage is adjustable for the different sizes and lengths of pipe. It will gage lengths of pipe up to and including 4 ft. The parts coming in contact with the revolving pipe are hardened to resist wear. The gage arm is a heavy casting.



Heavy Duty Pipe Cutting Machine



# The News of the Industry

## North Shore Rights Through Chicago Disputed

Corporation Counsel Believes High-Speed Interurban Has Exceeded Its Rights

An opinion was recently delivered to the City Council of Chicago by the corporation counsel holding that the Chicago, North Shore & Milwaukee Railroad is operating passenger, merchandise dispatch, express and freight service over the Northwestern and South Side "L" lines within the city limits without legal rights. This opinion is the result of an order passed by the City Council which declares that the North Shore Line is operating within the city without franchise and requires that it be compelled to stop its trains at all stations or get off the right-of-way of the "L" lines altogether. The city law department contends that the franchises of the two "L" lines do not give these companies the right to grant trackage rights to the North Shore Line.

### HISTORY OF THE CASE

According to the legal department of the North Shore Line, this company operates over the "L" tracks under a statute of the State of Illinois which provides that one railway property may lease trackage rights over another railway property, even though such rights are obtained under protest. A city ordinance, however, does prevent certain steam road equipment from being operated over the elevated structure. This ordinance has not been violated by the North Shore Line because no attempt has been made to operate other than electric railway equipment.

In July, 1907, the City Council of Chicago passed an ordinance authorizing the Chicago, Milwaukee & St. Paul Railroad to electrify that part of its Evanston Division lying between Irving Park Boulevard and the city limits on the north. The ordinance provided that trains be operated electrically, either by the St. Paul company or by the Northwestern Elevated, but that in either case passengers should be carried from all stations within the city limits to all stations on the Union Loop without change of cars.

In 1910 the City Council passed an ordinance requiring the St. Paul company to elevate its tracks from Montrose Avenue to the north city limits, but no construction work was done then. Later the Chicago, North Shore & Milwaukee Railroad desired to get entrance over the elevated structure into the Chicago Loop. The St. Paul Railroad was willing to lease its right-of-way from Wilmette, a suburb just

north of Chicago and Evanston, to Montrose Avenue to the North Shore Line, provided the Northwestern Elevated would surrender its contract made in 1907. The St. Paul company was ready also to elevate its entire right-of-way for additional tracks, provided the North Shore Line would undertake to handle electrically the freight business of the St. Paul Railroad along the lake shore in Chicago and pay interest on the capital expenditure for such track elevation.

The North Shore agreed to assume these obligations if the Northwestern Elevated would surrender its 1907 agreement and permit the operation of trains of the North Shore Line over its track to the Union Loop and over the lines of the South Side Elevated to Twelfth Street. A joint operating agreement was entered into which rendered inoperative the agreement of 1907. The lease from the St. Paul Railroad was made to the North Shore Line, which is financially responsible to the St. Paul for all obligations, the Northwestern Elevated guaranteeing the performance of such obligations.

In this agreement the Northwestern Elevated, as between it and the North Shore Line, assumes all the lessee's obligations and in return gets the lessee's share of the benefits accruing from the lease, the North Shore Line reserving certain specified track rights, for which it pays the Northwestern Elevated rental, based on car mileage. Without the additional security given by the North Shore Line, the St. Paul would not have elevated its full right-of-way, so as to provide four main tracks for express service to the city limits instead of two as required by the 1910 ordinance. The continuance of service by the Northwestern Elevated north of Wilson Avenue is thus claimed to be directly dependent upon the performance of its obligations under the agreement, including the obligation to let the North Shore Line use its tracks to the Union Loop.

This lease and operating agreement was approved by the Illinois Public Utilities Commission in an order entered May 28, 1919, after a public hearing. On the plea of business men on the South Side, the Illinois Commerce Commission on Nov. 2, 1921, made an order extending the service of the North Shore Line to Sixty-third Street and Dorchester Avenue on the South Side. At both commission hearings the city was represented.

These agreements are said to be in strict accord with the ordinances of 1907, whereby the North Shore Line pays the city of Chicago an annual license fee of \$50 per car for each car operated over the elevated lines.

## One-Man Cars Still Operating in Oakland

City Seeks Aid to Raise Funds to Install Municipal Bus System—Railway Makes Offer

Resort will probably be had to the ballot in connection with the one-man car dispute in Oakland, Cal. The question of voting bonds to provide funds for municipally operated buses will be put up to the voters just as soon as the provisions of the initiative measure have been met. To this end the public is being asked to sign petitions, and as soon as the requisite number of signatures has been obtained the question of voting the bonds will be put up to the City Council.

What the voters will do if the question ever reaches them is, of course, problematical, but it would seem unlikely that the public will vote to discommode itself by paying an extra fare to ride in city buses, although it has been promised that the city buses will be run with a 5-cent fare, as against the 6-cent fare now being collected by the railway.

The San Francisco-Oakland Terminal Railways, which operates the local Oakland lines, has declared the proposed ordinance "unreasonable and therefore void." Aside from the merit inherent in the company's case in the present controversy its position is strengthened by the fact that a large part of its rush-hour traffic is carried across the bay in the company's own ferryboats and that most of the passengers thus carried transfer to the company's local trolley lines and to its high-speed suburban trains.

In the meantime, the one-man cars continue to be operated despite a city ordinance, but with the approval of the Railroad Commission. There are fifty such cars in use, although some of the larger ones are being run with two-men crews, replacing other cars, which have been sent to the shops. Threats of police action have been repeatedly made against the company by the city officials, but to Nov. 27 there has been no action along this line.

As far as public sentiment about the bus is concerned it seems to be divided. Buses are favored generally as feeders for outlying districts, but there is growing opposition to them in the more congested sections.

The railway itself is the latest to make an offer to run buses. It has filed with the City Council of Berkeley an application to operate buses in that city at a license fee of \$60 a year for each bus. This offer has been referred to City Manager Edy for his investigation and report.



The controversy in Berkeley antedates the one in Oakland by a month or two. That city passed an ordinance prohibiting one-man cars and the measure has been respected. One-man cars are not operated within the limits of that city.

In Alameda, too, there is a controversy. It is somewhat different from the others. In that city both the Peerless Stage Company and the railway have offered to run buses. The railway seeks to use the buses as feeders to its trolley lines, but the stage company wants to run buses on regular half hour schedules between Alameda and Oakland. This situation is made truly complex by the fact that the stage company has been refused a franchise in Oakland, the city officials of which desire to run a municipal bus service.

To date the only city run bus in Oakland is the Rosalie. It has been in service since the latter part of October, first on one run and then on another.

The one-man car controversy at Oakland really became acute in August when the company put into use with the approval of the State Railroad Commission a number of one-man, two-man cars. Previous to that time cars of the Birney type had been operated on Telegraph Avenue as far as Alcatraz. The only rumble against these cars came in the form of a protesting resolution passed at the national convention of the Amalgamated Association in Oakland early in September. These cars were only 25 ft. in length.

In August the one-man, two-man cars appeared and immediately the trouble started. Mayor John L. Davie, backed by Commissioner Moorehead, formerly business agent of the Oakland carmen's union, immediately prepared a resolution condemning the cars and then had the resolution passed by the City Council in the form of an ordinance.

### Atlantic City and Suburban Strike Declared Off

A truce has been declared in the strike of the employees of the Atlantic City & Suburban Railway, Atlantic City, N. J., against restoration of the one-man cars. Full service on the company's lines has been resumed under an agreement between the company and the men that for one month two men will be placed on all cars, with the exception of the one run between Pleasantville and Absecon, where one man will operate a car during the slack hours. One-man schedules for periods of sparse traffic on other lines are to be put into effect later. The strike followed announcement by the company of the resumption of the use of one-man cars. The men held to their original contention that this operation was dangerous.

Residents of fifteen towns on the mainland, including Pleasantville, Bower's Point and Absecon, were affected by the tie-up. Mayor Charles Jackson of Pleasantville issued permits for buses to operate on the shore road between that city and Atlantic City to relieve the situation.

## Franchise Amendment Vote

**\$1,500,000 to Be Spent by Ottawa Electric Railway if Residents Sanction Plan**

Residents of Ottawa, Ont., will have an opportunity on Jan. 7 to vote on the proposal under which the Ottawa Electric Railway will carry out \$1,500,000 of improvements. The negotiations toward this end date back to last summer.

On Aug. 10 the Mayor wrote to the company asking under what agreement it would undertake the Feustel improvements and extensions, requiring an expenditure of \$1,500,000.

On Aug. 18 the railway submitted a proposal with certain changes, agreed to since the negotiations with the city's street railway committee. Stripped of the "judicial phraseology," in which it is now clothed in a legal document, the agreement is briefly this:

The old agreement of 1893, which has stood the test of thirty years, and was automatically renewed last August for five years more, is to continue in effect with the following amendments:

The company is to have an exclusive franchise to carry passengers within the city limits by street cars or buses operating on regular routes; such franchise not to prevent the operation of cabs, taxis, or buses from outside points.

The company is to have the right to operate a certain number of one-man cars on light traffic lines, with a guarantee that their introduction will not affect the position or seniority of any employee.

The Sunday and limited rates of fare are to be discontinued, leaving a straight 5-cent fare for adults and 3-cent fare for children, with no change in the old rate for school children.

At the end of the present five-year extension of the old agreement (August, 1928) if the company finds it cannot carry on with the 5-cent fare, it may appeal to the Dominion Railway Board to have the rate of fare increased for the next five years.

At the same time if the corporation thinks the company has been making more money than it should out of the 5-cent fare, the city may appeal to the same board to have the rate of fare reduced.

The judgment of the Dominion Railway Board on such appeals to be accepted by the city and the company as final.

Extensions that may be required for the five-year periods after August, 1928, to be settled by a board of arbitration.

These, in short, are the principal terms. The company points out that under the old agreement the city had the right to buy the railway in August, 1923. It did not do so. The old agreement stipulates it may do so at the end of any five-year period after August, 1923; the price to be set by a board of arbitration. The conditions of the old agreement are not changed, except as described previously. Under the

new agreement the city still has the right to buy at the same time and under the same terms.

## Saginaw Transit Provides Service—Jitneys Disappear

Transportation service is now being furnished Saginaw exclusively by the Saginaw Transit Company, which was granted a franchise last June for street car-bus operation. The jitney buses that aided in the bankruptcy of the old Saginaw-Bay City Railway and later furnished all the local service since Aug. 11, 1921, have ceased to operate. They carried their last passengers on Dec. 1.

While complete city service is now being given by the new company, there is one car line yet to operate. The delay in steel shipments prevented the construction of the double-track switch and the territory that naturally would be served by that line is entirely dependent on motor bus service.

All of the bus equipment has been delivered and just as soon as the one railway route is ready the company will function under terms of the franchise.

Charles S. Kressler, general manager, is doing everything possible to give the proper service and it is generally believed that he will be successful. To ascertain the requirements of the city, a traffic flow census is to be taken of all manufacturing plants.

Mr. Kressler's recent talk to the merchants of the city when he pointed out the high costs of driving their own cars in preference to using the railway service has borne fruit and many business men now leave their automobiles in the garages and use the street cars or buses as the case may be.

In the future each car or bus will carry a neatly printed card bearing the name of the operator.

## "Spreckels Day" in San Diego

At a luncheon of the Optimists' Club in San Diego Claus Spreckels told what the San Diego Electric Railway was doing for Greater San Diego. Mr. Spreckels called on his department heads to arise in turn and give an account of themselves and their activities. E. J. Burns, assistant general manager of the San Diego Electric Railway, referred to the construction work being undertaken by the railway and its resultant expenditures. The plan of the Optimists' Club is to entertain the department heads of San Diego's largest business concerns at a series of noon-day luncheons. This particular day was celebrated as Spreckels Day.

## Subway Plans Ordered

Mayor Rolph of San Francisco has ordered City Engineer O'Shaughnessy to prepare plans and estimates for the Market Street rapid transit subway, saying it was proposed to submit improvements to the people at special elections to be held later. This was Mayor Rolph's first act after his re-election.



## Employees to Purchase Securities

Will Create Purchase Fund Out of Wage Increase, Suggestion Made by Thomas E. Mitten

Employees of the International Railway, Buffalo, have voted to use the 2½ cents an hour wage increase granted by the company effective on Jan. 1, 1924, to create a fund for the purchase of securities of the company. Because of the low prices now quoted for the 5 per cent bonds and the common stock of the company, the employees consider that an unusual investment opportunity is presented by these securities.

The formation of the investment fund was suggested by Thomas E. Mitten, chairman of the board of the railway and president of Mitten Management, Inc., which has a contract for operating the International. The wage increase will total approximately \$200,000 a year and the employees have voted to divert this money to the purchase of the company's securities in their own interest. According to figures presented by Mr. Mitten the \$200,000 will at present prices purchase \$200,000, par value, of 5 per cent bonds of the company and \$1,000,000, par value, of stock. The return on the bonds will be immediate, but for the present at any rate the virtue of the stock will lie in the appreciation in its quoted price as the condition of the company improves. In fact Mr. Mitten said that any appreciation in the value of the stock rests largely on the successful operation of the property through co-operation of employees and employers. The bonds are now selling at \$50 for each \$100 par value and the stock is quoted at \$10 for each \$100 share.

In announcing the wage increase of 2½ cents an hour, Herbert G. Tulley, president of the International, explained that Buffalo paid during the first part of the year 2½ cents an hour more than the average wage of Rochester and Cleveland, but during the latter part of the year the basic wage was 2½ cents below, the result being that for the entire year the wage rate paid by the International has averaged the wages paid in these two cities. The Cleveland rate now is 60 cents and Rochester 55 cents, the average being 57½ cents.

Mr. Tulley said that while the company is not now actually earning sufficient money to pay the wage increase, square dealing with employees calls for wage readjustments whether they be up or down. In view of the fact that the Buffalo scale is based on the average of Rochester and Cleveland the directors decided to grant the 2½ cents increase, making the Buffalo rate 57½ cents an hour for trainmen.

At the quarterly meeting of the board Mr. Tulley announced that the deficit in the company's income during the year to Nov. 1 was \$853,962. He estimated the total deficit of the year to Dec. 31, 1923, at \$1,000,000. He said that through economics in operation,

# Yellow Cab

## Drivers Measured By Their Deeds

How do you measure a man, by his reputation or his deeds? Hardly by reputation, for that is often false. By his deeds then? Of course. *That's the way we measure our drivers, and they either rise or fall by what they do.*

We pick these men by what their neighbors and tradesmen say of them, by their standing and reputation for ten years back. But it isn't their reputation that holds them here. We judge them by their deeds and how they serve you.

Their deeds have held most of them here for a long time. And they must be mighty good men or they couldn't stay here year after year. Don't you find them reliable men, and don't you find that in the main they are worthy of your friendship?

Naturally one will slip occasionally, "even as you and I." He will do something, or leave something undone, which annoys or angers you. And then you are apt to roast "the other ninety and nine." That is hardly fair, because as a body they are the best and fairest workmen we ever knew.

Just take notice of them when next you are on the street. See how busy they are and how seldom you see one loafing. They are alert, intent on their business, earning a living and anxious to please.

Be nice to them if they are nice to you. They are part of your daily life. Give them a smile once in a while. A smile is a big thing.

The thinking fellow calls a Yellow

# Yellow Cab Co.

'Phone Calumet 6000

Why Not Some Advertising of This Sort, Boosting Electric Railway Trainmen? It Would React Favorably on the Men as Well as on the Car Riders. If They Did Not All Measure Up to the Standard Set in the Ad, Such Advertising Would Inspire Them to Try to Measure Up

impossible under the labor conditions that existed before the strike, the company could return to the 5-cent fare if it were carrying upon its cars all passengers now transported in jitneys, club cars and in privately owned motor cars. The present fare is 7 cents with four tokens for 25 cents.

The president of the co-operative committee submitted a report showing that during the year fifteen members had died and that \$15,000 in insurance had been paid to their families. Sick benefits of \$10,379 had been paid and \$20,000, par value, of the company's gold bonds had been acquired. There is now a cash balance on hand of \$4,515 as the result of the first year's operation of the Mitten co-operative plan.

## Oklahoma City-Shawnee Interurban Line Planned

The Corporation Commission of Oklahoma has recommended approval by the Interstate Commerce Commission of a project to refinance and rehabilitate the old Oklahoma City-Shawnee-Atoka line of the Katy railroad, which has been in financial difficulties for several years. The line was disposed of at receiver's sale on Sept. 28, this year, and K. W. Shartel, attorney, of Oklahoma City, and others, are asking authority to issue bonds and stock to refinance the property.

If the Interstate Commerce Commission accepts the recommendation of the Oklahoma commission the line probably will fall into the hands of two companies organized for the purpose of operating it, the Oklahoma City-Shawnee Interurban Railway and the Oklahoma City-Ada-Atoka Railway. The former project contemplates electrification of the line from Oklahoma City to Shawnee and the latter to operate steam-propelled cars from Shawnee to Atoka.

Final ownership of the property depends upon success of efforts to issue \$800,000 of common stock and an equal amount in first mortgage bonds in connection with each project and other financing details. There is a possibility that the proposed electric portion of the line may be acquired by the Shartel interests and run in connection with the interurban system of the Oklahoma Railway, now operating lines from Oklahoma City to Norman, to Guthrie, to El Reno and intermediate points on each line.

## Mr. Kempster Returns After Illness.

—After an absence of several months, due to illness, A. L. Kempster, general manager of the New Orleans Public Service, Inc., made his first public appearance at a dinner tendered him on Nov. 27 by the Commercial Club's members of the corporation. Mr. Kempster gave a short talk to the assembled corps of workers of the utility on its purpose and obligations to the public and the best methods to be employed to advance their joint interests.



## City Operates Bridge Service

**Brooklyn Surface Lines Withdraw from Williamsburg Bridge When City Takes Over Shuttle Line**

Shuttle service over the Williamsburgh Bridge between Marcy Avenue, Brooklyn, and Essex Street, Manhattan, was started on Dec. 1 by the city of New York with rolling stock equipment of its own. Operation is under the direction of the Department of Plants and Structures, with Grover A. Whalen, head of the department in charge. The run from terminus to terminus of the bridge is a little more than a mile. Tickets are sold at the rate of three for 5 cents. The equipment on hand consists of fifty-four cars, composed of thirty-two Birneys bought especially for the bridge service and twenty-two rebuilt cars secured previously from the Second Avenue Railroad for use on the city's line on Staten Island.

On the morning that this service was begun the Nassau Electric Railroad, the Brooklyn, Queens County & Suburban Railway, the Coney Island & Brooklyn Railroad and the Brooklyn City Railroad, all operating surface lines in Brooklyn, withdrew from the operation of cars across the bridge from Brooklyn into Manhattan. These lines now all terminate near the Bridge Plaza, Brooklyn, and former patrons of them desiring to travel to Manhattan are required to pay an extra fare on the bridge locals operated by the city or else take the elevated line over the bridge from the plaza, for which they must pay an extra fare of 5 cents. It is, however, possible for a few of them to take cars of the New York City surface lines at the plaza in Brooklyn, for in contradistinction to the service operated from Brooklyn into Manhattan by the Brooklyn lines the New York surface lines, or more properly the Manhattan surface lines, operate from Manhattan into Brooklyn.

The original terminus of the Brooklyn lines which have been using the bridge was at the ferries at the foot of Broadway, Brooklyn, but with the opening of the bridge ten years ago a new approach to Manhattan from Brooklyn was afforded and the Brooklyn lines began to operate into Manhattan over the bridge, but there was not franchise obligation in connection with this operation. In addition, in accordance with a contract with the city now expired, the Brooklyn surface lines operated the purely local shuttle service over the bridge. The contention of the Brooklyn surface companies is that they were able to continue operation of their lines into Manhattan because they have been able partially to pay the added cost which the through service has entailed from the revenues derived from operation of the local service on the bridge. The Brooklyn companies regarded the determination of the city to take over the local bridge service to be not only detrimental to the best interests of

the traveling public but unfair to the companies affected.

The companies said they could not possible, from a physical standpoint, continue their service in connection with the city service. The shuttle service as handled by the Brooklyn companies was about 40,000 passengers a day. In addition 68,000 passengers a day were handled on the through cars. The fare on the private shuttle line was 2 cents cash with three tickets for 5 cents.

It had been indicated that Mr. Whalen would ask the Transit Commission to take action to compel the Brooklyn surface lines to continue to run their cars across the bridge. The Transit Commission says that it has no such power. The commission points out, as the companies had done previously, that the Brooklyn lines have not been operating surface cars upon the bridge under corporate franchises.

## Immigration Program at New York Meeting

Administrative leaders in Washington, not only in the House and Senate, but in executive departments as well, will follow the recommendations laid down in the message of President Coolidge, and be guided by the nation at large on the question of needed immigration laws. Advices to this effect have been received from official sources by the sponsors of the National Immigration Conference, which will be in session at the Hotel Astor in New York, on Dec. 13 and 14.

The immigration conference in New York will be the first of its kind ever held. It will be attended by representatives of business organizations, official departments of the government, public and social service organizations, delegates of several foreign governments, and individuals who have made a study of the whole effect of immigration on the national life. The conference has been arranged by the National Industrial Conference Board, which found at the end of a two-year study of the problem both here and abroad that definite information on which to base new laws was desired by legislators and industrial leaders of the country. The present per centum act expires next June and its retention or new laws form one of the major questions now before Congress.

## Wages in Philadelphia to Be Increased

The Philadelphia Rapid Transit Company is to raise its basic wage from 64 cents to 65 cents an hour on Jan. 1. Any further increase in 1924 will be paid to the trustees of the co-operative wage dividend fund. Average of the three cities used as a basis for Philadelphia Rapid Transit wages is 67½ cents an hour, Chicago being 73 cents, Detroit 70, and Cleveland 60, so on the present scale there would be 2½ cents an hour to be paid to Philadelphia Rapid Transit wage fund trustees.

## Indeterminate Franchise Suggested for Los Angeles

The Board of Freeholders elected at the last general election in Los Angeles for the purpose of framing a new city charter has approved a charter provision for the indeterminate type of franchise.

The proposed charter amendment as adopted is subject to exhaustive conditions and will allow the widest latitude possible in the selection of the type of franchise desired, whether for a fixed or indeterminate period of time. The proposed amendment to be incorporated in the new city charter gives the City Council of Los Angeles the power to grant either a fixed or indeterminate franchise.

Such a condition will allow public utilities or the city to carry out a program of expansion and alleviate troubles of that character that have been difficult to solve in the past.

A protection of the city's ultimate development of a subway or elevated railway system is contained in the amendments to the charter by a provision that gives the city power to revoke any franchise in or upon any of the streets within the part of the city bounded by Temple Street, Figueroa Street, Washington Street or Central Avenue on a year's written notice.

One Freeholder attempted to draw up a provision relating to transportation utilities, with a view of incorporating a clause for an eight-hour day for platform workers, but the amendment failed to carry that provision.

## Ford Road May Be Electrified by Spring

Work on the electrification of the Detroit, Toledo & Ironton Railroad, the Ford road, is well under way. Completion of the work depends, however, upon the development of the Ford power house at River Rouge, Mich. Work on the first of eight 62,500 hp. units of the power house is 85 per cent completed. A test run of the first unit of this plant is scheduled for next January. The second unit is about 15 per cent completed.

The output of the plant will be used entirely for Ford industries, including the Detroit, Toledo & Ironton Railroad.

Work on the turbines was started more than a year ago at the Ford shops following the installation of two units of 12,500 kw. each, made by an outside firm. The production of the new turbines was undertaken by engineers and machinists who helped develop Ford automobile production methods and handled the manufacture of turbines for the Ford "Eagle" boats.

In connection with the electrification of the Detroit, Toledo & Ironton Railroad, the double track from River Rouge to Flat Rock is more than half completed. This is the first section on which electricity will replace steam. All of the activities toward electrification of the first section are scheduled for completion next May.



## Payment of Franchise Tax in Cincinnati in Prospect

Settlement of Cincinnati's traction problem is foreseen in the action taken at a recent meeting of the Hamilton County executive and advisory committee. One outstanding feature of the meeting was the adoption of a resolution which indicated that the organization would work to bring about the immediate payment of the \$350,000 franchise tax due yearly from the Cincinnati Traction Company and induce better service and lower rates of fare. Committees representing the traction company and the Cincinnati Street Railway, which leases the railway system, have been negotiating for the past two years in an effort to bring about a settlement of the matter, but little progress has been made in the direction of a settlement. Therefore the city administration appears to be determined to force one of the companies to act.

Some members of the Republican organization are of the opinion that the only definite step is to refuse any further deferment of the franchise tax. Others feel that a forfeiture of the traction company's franchise is the surest move, while still another group contends that a consolidation of the Cincinnati Traction Company and the Cincinnati Street Railway and a divorce of the traction company from its subsidiary companies would solve the problem. It was announced that Mayor George P. Carrel would upon his return to the city call a meeting of the Citizens' Traction Committee, appointed by him more than a year ago, to ascertain what that body has accomplished. It was stated that the Citizens' Traction Committee has been awaiting a decision from the committees representing the traction company and the street railway before making any recommendations. The traction committees have not been in session for more than three months, but since that time the Cincinnati Street Railway has made an offer to the Cincinnati Traction Company to take back the system for \$1,000,000, which the latter company turned down.

## Home Rule Legislation Chief Problem Before Legislature

So great and so complicated are the problems presented by the new home rule for cities amendment to the New York State Constitution, adopted by the people at the general election in November, that virtually no other legislation will be considered, or even drafted, until a tentative program for putting the home rule provisions into effect has been promulgated.

This applies particularly to public utility legislation, as until the exact scope of changes in the present law and the additional legislative powers that will be given cities under the provisions of enabling acts to carry the constitutional amendment into effect have been definitely determined any change in the statutes affecting public

utility regulation in so far as their regulation by municipalities is concerned would be entirely without standing.

The first problem the Legislature of 1924 will have for solution will be the granting of specific powers to cities under the home rule amendment. In the interval a conference of mayors of the different cities is to be had to obtain the views of various executives as to just what powers are wanted. So that whatever public utility legislation is considered as a part of the legislative program of 1924 will be coordinated with and subject to the program which is ultimately adopted with reference to the application of home rule.

## Hollywood Chamber of Commerce Makes Another Attempt to Compel Extensions

The Hollywood Chamber of Commerce recently renewed its fight to compel the Los Angeles Railway to extend several of its lines, totaling 10½ miles of single-track construction, into the Hollywood district by the filing of a petition for a rehearing of its entire case with the State Supreme Court. The petition sets forth that the tribunal, in its previous decision against the car line extensions into Hollywood, was not in full possession of the facts.

The original petition for a writ of mandate was denied by the State Supreme Court in a decision handed down on Oct. 31, the decision being based on the ground that the Railroad Commission of the State of California had no power to order or compel the railway company to extend its lines when no franchise to construct the line had been applied for, or granted. This matter was reviewed in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 10, page 832.

At the time that the court handed down its decision in denying the Railroad Commission jurisdiction in such matters, the court drew a distinction between a railway franchise and franchises under which other public utilities, such as water, gas, electric and power companies, operated. The railway franchise, the court sets forth, specifically limits the amount of territory to be served whereas the franchises of other public utilities do not contain such a provision. The extensions of carlines demanded, the court ruled, could only be obtained under a new franchise.

The Chamber of Commerce in its petition for a rehearing claims that the charter of the railway contains a clause providing for extensions into new territory, although it is admitted that the ordinary railway franchise does not do this. This declaration, it is cited, is as binding as a franchise when a district to be served offers remunerative traffic.

The territory specified is already served by the Pacific Electric Railway lines. The cost of the extensions is estimated at \$1,500,000.

## One-Man Car Agitation Dropped

The referendum petition for the abolition of the one-man cars in Massachusetts, which was to be filed Dec. 5, was not filed. Not enough people were interested to carry out the threatened referendum. Presumably, this closes the agitation in Massachusetts, at least for the present.

## News Notes

**Adjustment May Effect Electrification Project.**—Litigation that has prevented work on the electrification of the Missouri, Kansas & Texas Railroad between Dallas and Denton may be ended through the efforts of the citizens of Dallas to bring about an adjustment of the opposition of residents on one street in the city of Dallas toward the construction of the interurban railway track. Arrangements for carrying out the work of electrification have been completed.

**Elevated Use Unsettled.**—The question of the continued use of the elevated railway at Kansas City has not been settled. Judge Stone of the Federal court said recently that both Kansas City, Kan., and Kansas City, Mo., would have to do away with the rentals which have been charged to the Kansas City Railways, but neither city would agree to do this. Consequently, the matter is still open and appears likely to remain open until after the question of lifting the receivership of the railways has been settled.

**Grants Wage Increase.**—The United Railways & Electric Company, Baltimore, has granted a wage increase to its employees amounting to about 2 per cent. The change takes effect Jan. 1. The largest class of employees, motormen and conductors, will receive from 46 to 51 cents an hour instead of from 45 to 50 cents.

**Mr. Craig's Sentence Remitted.**—President Coolidge on Dec. 5 remitted the sixty-day jail sentence imposed upon Charles L. Craig, Controller of New York City, by Federal Judge Julius M. Mayer of the United States Court for the Southern District of New York, for criminal contempt of court. This action was recommended by Attorney General Daugherty after consideration of the case by the legal staff of the Department of Justice. The Attorney General and his advisers opposed the granting of an outright pardon and severely criticised Mr. Craig, and the President approved the department's recommendations for only a remission of the sentence. Sentence was passed upon Mr. Craig by Judge Mayer because the court was convinced that Mr. Craig had cast aspersions upon the court that were in no way justified by the facts. Mr. Craig's remarks were made in connection with the court's handling of the affairs of the Brooklyn Rapid Transit Company, then in receivership.



**Ordinance Provides for Terminal Change.**—Commissioner Paul H. Maloney of the department of public utilities of the New Orleans Commission Council has offered an ordinance for adoption which provides for the removal of the terminus of the Orleans-Kenner Electric Railway from its present site to South Liberty Street. The purpose sought by the Maloney ordinance is to relieve the existing traffic conditions in South Rampart Street, near Canal, which the report by John A. Beeler referred to as a menace to public safety. The ordinance represents the conclusions reached by the city officials and those of Jefferson Parish after a long series of conferences. The Orleans-Kenner line is not released, under the ordinance, from carrying out its obligations, under its franchise, to build a permanent terminal in New Orleans.

**Men from Offices Act as Trainmen.**—When twenty-four out of twenty-five operators of cars on the Holland division of the Michigan Railway failed to report for work on Dec. 1, officials of the company left their desks and became motormen for a day. F. W.

Brown, general superintendent of the company, said the trouble had started when the men objected to the combination of freight and passenger business in one run. He announced that the men had violated their agreement with the company which provides that in case a matter at issue is not settled between the superintendent and the men it shall be referred to the general manager, and then, if still unsettled, shall go to the arbitration board. The twenty-four operators were not permitted to resume their work.

**Reaches Agreement on Service.**—The Public Service Commission on Nov. 16 closed its records on the complaint of the Woodlawn (Erie County) Taxpayers Association against George Bullock of the Buffalo & Lake Erie Traction Company, in relation to car service between Woodlawn Beach and Buffalo. This action was taken by the commission on an agreement of the receivers of the Buffalo & Lackawanna Traction Company and the Hamburg Railroad to operate their respective cars so as to meet at least once an hour for an interchange of passengers at the Hamburg turnpike at the Buffalo city line.

6d. for 1d. stages to 4s. for stages costing 3.5d. to 4d. total. The Colne pass will cost 2s. The weekly pass is arousing great interest among other British tramways, which hope thereby to be able to retain the usual 1.5d. minimum fare for all but regular riders instead of being compelled to go back to the pre-war fare of 1d. for single trips. In some cases, therefore, the pass prices are being considered on the basis of giving a reduction to regular riders at little or no loss compared to what would follow a cut to the lower base fare for everybody.

### Esthonia Plans Improvements

The Esthonian government plans spending 30,000,000 Esthonian marks for railway improvement and 25,000,000 marks for the construction of railway building. In addition 34,000,000 marks will be used for the electrification of the Reval-Nemme line.

### Zurich Street Railways Extend

The report of the Zurich Municipal Street Railways (serving 199,567 inhabitants) for the calendar year 1922 is notable for announcement of extensions. In March, 1922, construction was begun of an extension costing 680,000 francs (approximately \$136,000). In September a credit of 198,000 francs (\$39,600) was granted for a second extension. The number of single-track miles in operation increased from 49.3 miles to 50.9 miles, exclusive of some 4.8 miles of carhouse and yard trackage.

The number of passengers declined slightly over 1921, viz., from 46,660,218 to 46,273,856, and revenue dropped from 11,716,327 francs to 11,577,076 francs. The average fare was 25 rappen or practically 5 cents. The average number of rides per inhabitant per annum was 232 compared with 230 in 1921. The city service amounted to 11,400,343 car-km. (say 7,068,000 car-miles), of which 3,018,653 car-km., or 1,872,000 car-miles, was furnished by trailers. The annual service per inhabitant was 57 car-km., or 35.3 car-miles. This was achieved with 241 motor cars and eighty-seven trailers.

There was no change in fares. Some 24 per cent of the riders used the 20 rappen or minimum single fare, another 15 per cent paid 30 rappen and about 8 per cent paid 40 rappen. Most of the remaining fares were paid in the form of weekly limited-ride tickets, workmen's tickets and unlimited-ride, non-transferable season tickets or passes. Total gross for the year was 11,774,808 francs, while operating expenses increased 0.46 per cent to 9,740,249 francs, leaving 2,034,558 francs for overhead charges, renewal funds and the like. Beginning with the year 1920, it has been possible to meet all of these costs and also to reduce to 1,589,296 francs (end of 1922) the deficit of 2,842,256 francs which had accumulated over the period 1914-1919 because of war conditions.

## Foreign News

### Interchangeable Season Tickets in London

A new form of interchangeable season ticket, good on railway, tramway and bus, has been used by the London Underground Railway and associated companies as an experiment since last May. It has proved so successful that the scheme is being further extended. The ticket, which is a season one, has been tried up until recently at Golder's Green Station. It enables a passenger living beyond that place to board a bus or a tramcar, travel to Golder's Green Underground Railway station and continue his journey by the railway. Over 1,000 tickets of this kind are now in daily use at this point. The scheme has been extended to a number of other suburban stations on the Underground Railway, and still further extensions are contemplated.

### British Fare Agitation as Seen by "Journal" Representative

There is some agitation in nearly every city in the United Kingdom for a return to the pre-war rates of fare on electric railways, according to a representative of the ELECTRIC RAILWAY JOURNAL, who recently has returned to this country from a trip abroad. At least, there is periodic clamor for reductions in the rates being charged. The argument against a reduction in the rate of fare beyond the point that is justified, which seems to impress the public, is that the taxpayers in a community are discriminated against unjustly when street car

fares are reduced to the point that does not allow an adequate return on the investment. Street cars are used by taxpayers and non-taxpayers alike. They are used extensively by people from other communities, and by visitors generally. If the fare is too low it means that the visitors and the non-taxpayers benefit at the expense of the community. If the fares do not provide for the return on capital and the maintenance and extension of lines, the necessary funds must come, directly or indirectly, from the city treasury. It is easy to demonstrate how an unremunerative rate of fare on a street railway would discriminate against the community and differs in that respect from electric, gas or water service which is installed in tax-paying property. If the charge for the service does not pay its cost, it is paid indirectly by those who use it. The public in Great Britain seems only recently to have grasped this phase of the fare situation and it has done much to temper the demands for unjustifiable reductions.

### Weekly Passes on Four British Tramways

The experiences of Bradford and Doncaster, with a population of 300,000 and 54,000 respectively, with the weekly pass have induced the Rotherham and Colne Corporation Tramways to try the same plan. The population of Rotherham and Colne is 75,000 and 26,000 respectively. The Rotherham Tramways installed a series of passes on Nov. 12 at rates ranging from 1s.



# Financial and Corporate

## Operation Unified

Railway Near Philadelphia Co-ordinates Its Lines and Buses—Population Served Greatly Increased

Events are taking place rapidly in the affairs of the West Chester Street Railway, West Chester, Pa. In the last six months the company has acquired many miles of track and more than 100 miles of bus routes. This has resulted in an increase in population contact from 42,000 to more than 300,000.

The West Chester Street Railway formerly operated a line of 21 miles of single track extending from West Grove through Avondale and Toughkenamon to Kennett Square, a distance of 7½ miles, extending thence southward a distance of 14 miles to Brandywine Springs on the outskirts of Wilmington. Almost the entire population served by the railway was located on the Kennett-West Grove division, the earnings of which are understood practically to have carried the whole property.

During the early part of the current year the interest controlling the old property decided to cease operation, and service was stopped during April, 1923. The property was purchased by a bondholders' committee under foreclosure proceedings, and sold by it to local interests. An attempt was made by the purchasers to refinance operation of the whole property, but this attempt was finally abandoned and the 7½-mile section between Kennett and West Grove was sold to the same interests which control the West Chester Street

State Laws, to reorganize the West Chester, Kennett & Wilmington Electric Railway, this being done under the name of the Chester County Traction Company, which will be a subsidiary of the West Chester Street Railway. In this manner the population per mile of track operated on its Kennett division will be increased. The section of railway between Kennett and Brandywine Springs was sold to the S. Snyder Corporation, Rochester, N. Y.

The West Chester Street Railway has through its subsidiary, the People's Transportation Corporation, acquired control of all the motor bus routes in southern Chester County, connecting points in this district with the cities of Chester, Pa., and Wilmington, Del., and a co-ordinated plan of railway and motor bus transportation for the entire district is now being worked out.

## \$1,325,896 Balance Reported at New Orleans Under New Agreement

The New Orleans Public Service, Inc., has reported for the year ended Sept. 30, 1923. This is the first year of operation under the new agreement at New Orleans. The balance indicated as available for sinking fund requirements, dividends and surplus return was \$1,325,896. The rate base was fixed to begin at \$44,700,000. The rate of fare dating from Sept. 27, a year ago, was 7 cents. The statement of earnings follows:

	Railway	Electric	Gas	All Departments
Operating revenue.....	\$7,571,560	\$3,914,109	\$2,743,750	\$14,229,420
Operating expenses, including renewals and replacements reserve.....	5,331,175	2,229,132	1,686,908	9,247,215
Net operating revenue.....	2,240,385	1,684,977	1,056,842	4,982,205
Taxes and uncollectible consumers' accounts.....	*862,258	451,930	321,293	1,635,482
Net operating income.....	1,378,127	1,233,047	735,549	3,346,723
Miscellaneous income.....	93,502	28,239	33,642	155,384
Gross corporate income.....	1,471,629	1,261,286	769,191	3,502,107
Income deductions.....				2,176,211
Balance available for sinking fund requirements, dividends and surplus reserve, in accordance with ordinance No. 6822 C.C.S.....				\$1,325,896
				Average for Year
Rate base.....				\$52,939,371
Per cent earned.....				6.61

\* Represents taxes only.

Railway, operating a railway from Coatesville through Downingtown and West Chester to Kennett Square. The West Grove division will be connected with the Kennett division of the West Chester Street Railway and through service operated from West Grove to West Chester.

In order to effect revival of service between Kennett and West Grove it was necessary, under the Pennsylvania

Commissioner Maloney of the Department of Public Utilities announced on Nov. 25 that he expected to complete soon the negotiations between the city and the Public Service, Inc., over the rate base on which the company is to be permitted to fix its rates for the ensuing year under its agreement with the city. As indicated in the accompanying statement the company in its annual report under the agreement with

the city reported a rate base of \$52,939,371 and a return for the twelve months of 6.61 per cent, which is 0.89 per cent under the return allowed by the franchise.

The city had the books of the company audited, and as a result, Commissioner Maloney says he is opposed to both the rate of return and the rate base shown in the company's report. He thinks the rate of return is larger than shown and the rate base should be lower. The dispute between the city and the company, he says, is over several large items carried by the company as a part of the rate base. It is understood that under the rate base claimed by the city the company will show a return of more than 7 per cent, or less than one-half of 1 per cent under the rate allowed by the franchise.

## Some New York Companies Do Better

The New York Transit Commission has made public statements concerning railway operations in New York during the month of September, compiled from monthly reports furnished to the commission by the several companies. The figures for September, 1923, are compared with those for the similar month in 1922.

The Interborough Rapid Transit Company, with gross of \$4,315,178.09, gained, in operating revenue, \$57,095.60 over September, 1922, while operating expenses of \$2,685,495 represented a decrease of \$62,236. The net corporate deficit of the company for the month was \$211,027, less by \$56,981 than in September, 1922. Interborough passengers carried in September, 1923, numbered 79,631,000, which was 1,381,211 over the previous September. The Interborough subway operations ran behind \$21,513 in September, about \$25,000 less than last September's deficit, the big loss occurring on the elevated lines.

The New York Rapid Transit Corporation (B.-M. T.), with gross of \$2,056,426, gained \$151,843 in operating revenue, while at \$1,399,078 its operating expenses decreased \$9,901. The company showed a net corporate income for the month of \$91,727.53, as against a deficit of \$71,207 under the receivership in 1922. Passengers carried numbered 40,078,420, a gain of 3,043,471 for September, 1923, as against September, 1922.

The New York Railways, with gross of \$758,524, showed a decrease in operating revenue of \$60,626. Operating expenses of \$654,674 were \$38,533 less than for the similar month in 1922. The net loss of \$139,662 was \$6,500 more than in September, 1922. With traffic of 13,428,905 the company carried 1,045,776 fewer passengers in September, 1923, than in the similar month in 1922.

The Third Avenue Railway system had a net corporate income of \$20,824, or \$12,495 less than September, 1922. Passenger traffic was 4,893,031, or 173,798 less than in September, 1922.



## Mr. Fagan's Figures Attacked

Special Master, Representatives of City and Pittsburgh Railways' Reorganizers Question Receiver's Figures

At the proceedings conducted before the court on Nov. 26 with the end in view of lifting the receivership of the Pittsburgh Railways three elements were on record as declaring the railway solvent. They are former Judge Wasson, special master for the court; the city of Pittsburgh, and the railways company reorganizers, as represented by the Philadelphia Company. As stated previously, Charles A. Fagan, one of the receivers, holds that the company is still insolvent.

Special Master Henry G. Wasson, delegated by the court to inform it whether the reorganization was possible at this time, recommended the reorganization. He figured the working assets of the company at the end on one year's operation by the owners would be \$1,795,075.

Receiver Fagan of the railways acting independently of his two colleagues, Receivers W. D. George and S. L. Tone, informed the court, shortly after the Wasson recommendation was filed, that the railways, instead of being solvent, was still "manifestly insolvent" and he submitted figures to show that instead of a surplus the railways after one year's operation would show a deficit of at least \$1,285,207 or, if other elements were considered, a deficit of \$3,036,668.

The city's figures, with those of the Philadelphia Company, parent company of the Pittsburgh Railways, were filed with the court on Nov. 26, the latter in the name of the Pittsburgh Railways as a corporation, and in the form of an answer to Mr. Fagan's figures.

A surplus at the end of the first year's operation, instead of a deficit of \$1,500,723 is claimed in the reply to the Fagan figures submitted in behalf of the reorganizers by A. W. Robertson, vice-president and chief counsel. Mr. Robertson's petition is in part as follows:

From an examination of the items in Exhibit A, attached to Mr. Fagan's report as made in detail in our Exhibit 2, it will be seen that items totaling \$1,101,930 are duplicates and are included twice in the figures shown in said Exhibit A, and that the total deductions in said exhibit should be reduced by the amount of such duplication.

A further examination of Exhibit A discloses that it includes \$1,684,000 as payment of retirement of capital, which is not properly chargeable against operating expenses, and which the company has no expectations whatever of paying out of the operating income, but does expect to pay such obligations as they come due in future years by selling other securities or extending the time of payment of the respective obligations themselves.

Taking into account these several items, the aggregate of the sums which must be met during the coming year are reduced to \$4,800,728. This leaves a surplus of \$1,500,723, instead of a deficit as shown in the original Exhibit A.

**Partial Discontinuance Allowed.**—The Public Service Commission recently granted permission to the Massachusetts Northeastern Street Railway to

discontinue its railway service on 3 miles of its road between Rowe's Corner, Newton, to the state line at South Hampton. Residents of Newton protested against the discontinuance of this branch.

## Abandonment Threatened at Astoria, Ore.

The railway at Astoria, Ore., will probably be abandoned. The system is one of a little more than 5 miles. It is owned by the Pacific Power & Light Company. Just about a year ago, Dec. 8 to be exact, an area of thirty-five city blocks was wiped out by fire and the railway and the power and light lines of the company were damaged to the extent of about \$175,000. Fortunately the main feeders of the company were installed just beyond the limits reached by the fire, so that power and railway service were quickly resumed. More than fourteen blocks of railway track was destroyed. The necessity arises now to rehabilitate the railway system. That work the company's engineers estimate would cost \$150,000. As the railway is a losing proposition the company has notified the local City Commission of its intention of abandoning the railway.

## Auction Sales in New York

At the public auction rooms of A. H. Muller & Sons the following securities were sold on Dec. 5:

4,000 shares Interborough Consolidated Corporation, common, 5 cents per share,  
505 shares of Second Avenue Railroad, 50 cents per share.

\$5,000 Second Avenue Railroad 6 per cent receiver's certificates, 37½ per cent flat.

\$41,000 Second Avenue Railroad first consolidated 5 per cent bonds, due 1948, certificates of deposit 3 per cent.

1,000 shares of Mobile Light & Railroad Company, \$1 per share.

310 shares of Interborough Consolidated Corporation common, \$3 lot.

300 shares of Interborough Consolidated Corporation common; 550 shares Interborough Consolidated Corporation preferred, \$100 each, \$85 lot.

50 shares of Brooklyn Rapid Transit Company, \$2 lot.

## Permission Sought to Abandon Suburban Line in Oklahoma

The Pittsburgh County Railway, which operates city lines in McAlester and North McAlester and an interurban line to Hartshorne, Okla., will be heard on Dec. 20 before the Corporation Commission on a petition seeking permission to abandon its line extending from the eastern limits of McAlester to the country club. During the past two years, the petition recites, the line has been operated at a great loss. In fact the petition states that the whole city system is being operated at a loss and continued operation of the country club line will only increase the financial burden now placed on the entire system. Business began falling off on the country club line as early as 1919, when the company secured an order from the commission permitting it to suspend service from April 1 to Nov. 1 of each year. The company now desires permission to abandon the line entirely and take up the tracks.

## Negotiations on to Lift Birmingham Receivership

The receivership of the Birmingham Railway, Light & Power Company, Birmingham, Ala., may be lifted soon after Jan. 1. J. S. Pevear, co-receiver for the company, and W. B. White, attorney representing Lee C. Bradley, the other receiver, have been in New York working toward that end.

It has not been made public in Birmingham how the transaction will be handled, but it has been indicated that local interests may borrow the money in New York, give the property of the company as security, and operate it themselves.

**Preferred Stock Offered.**—Harrison & Company and Janney & Company, Philadelphia, Pa., are offering \$1,400,000 of the first preferred 8 per cent cumulative stock of the Georgia Railway & Power Company, Atlanta, Ga., series of 1924. The price is 104 and accrued dividends to yield 7.69 per cent.

**Mortgage Gold Bonds Offered.**—A syndicate, headed by Drexel & Company, Philadelphia, Pa., is offering \$4,000,000 of the first and refunding mortgage 5 per cent gold bonds of the Southern Public Utilities Company, Charlotte, N. C. The bonds, dated July 1, 1913, and due July 1, 1943, are offered at 91½ and interest to yield about 5.75 per cent. This is an additional issue, the proceeds for which will reimburse the company in part for capital expenditures already incurred in excess of \$7,800,000, which includes the cost of the new 80,000 installed hp. Mountain Island hydro-electric station to be put in operation next month.

**Board Has Vacancy.**—The death of former Governor Samuel W. McCall of Massachusetts creates a vacancy in the board of trustees of the Eastern Massachusetts Street Railway, Boston, Mass. Mr. McCall was one of the five public trustees having been appointed to succeed Homer Loring, former chairman, who resigned. The terms of the trustees, who were appointed for a five-year term, expire in January next. The law requires appointment of successors to serve for another five-year period beginning in January. The four remaining trustees are Arthur G. Wadleigh, chairman; Fred J. Crowley, Isaac Sprague and Earle P. Charlton.

**Collateral Securing Notes Sold.**—At an auction of \$3,000,000 first lien and refunding mortgage gold bonds of the Washington-Virginia Railway, Washington, D. C., the entire amount was bought by Edward P. Hopkinson, Jr., representing the note holders, for \$2,000. The 6 per cent notes, which matured on Jan. 1, 1922, were secured by these bonds. Before the sale R. H. Phillips representing some of the bondholders, stated he thought bidders should know that receivers had been appointed for the company, and he deemed it improper that the bonds should be sold without an order of the court.



# Traffic and Transportation

## Commission Recommends Traffic Improvements

The Los Angeles Traffic Commission has recommended to the City Council that certain practices be adopted for bettering traffic conditions. One provision calls for immediate adoption of an ordinance prohibiting the parking of passenger vehicles in the downtown congested district of the city from 7 to 10 a.m. and 4 to 6:15 p.m. instead of only from 4 to 6:15 p.m. as at present, and to be effective only during the holiday season to relieve pre-holiday congestion. Stricter enforcement of present state and city traffic regulations is also suggested.

The commission also recommended that the police department rigidly enforce the existing loading zone ordinance, prohibit the parking of vehicles in the second line of traffic and use its full authority to facilitate the free movement of street cars wherever police officers are available.

It recommends further that the Los Angeles Railway and Pacific Electric Railway be authorized to paint yellow lines on the street surfaces wherever desirable parallel to the outside street tracks 4 ft. from the outside rails. This color is suggested in order that the lines will not be confused with the white lines used in marking the loading zones.

The Traffic Commission offers to aid the Los Angeles City Council in any capacity it may determine to relieve what is termed to be an unusual condition in traffic congestion.

## Special Theater Fare Rates Made by Indiana Interurban

It has been announced by the Indianapolis & Cincinnati Traction Company that very low round-trip rates will be made during December for the benefit of patrons attending Indianapolis theaters in the evening. The new reduced fare will be good only on evening trains. It is expected that this plan will develop additional business on trains that are usually operated at a loss. It is understood that if the theater fare arrangement proves popular it may be made a permanent feature of the I. & C. service.

## One-Man Car Case Before the Wisconsin Supreme Court

The one-man car situation in Milwaukee is expected to be drawn to a head on Dec. 14. On that day the Wisconsin Supreme Court will hear and consider the appeal of the city attorney of Milwaukee charging that the Wisconsin Railroad Commission exceeded its authority when it granted permission to the Milwaukee Electric Railway & Light Company for the operation of

one-man cars in Milwaukee. The city contends that the State Legislature never conferred on the commission power to approve the operation of one-man cars in Milwaukee.

The city attorney says that operation of one-man cars in Milwaukee is contrary to a city ordinance. The contention of the city attorney that cars must be run with two men was not upheld by the Dane County Circuit Court, Madison. That court ruled that the Railroad Commission did have jurisdiction over the operation of these cars in Wisconsin cities, and it is from this decision that the attorney for Milwaukee is appealing to the Wisconsin Supreme Court.

## Plush Seats in New Chicago "L" Cars

Several trains of the new steel cars recently received by the Chicago "L" were placed in service Dec. 2 on the various branches of the Chicago Elevated System. Shipments of these cars from the plant of the Cincinnati Car Company to date total 75 out of the 102 ordered. The cars are similar in construction to the company's 1914 design of steel cars with the exception that the center side door has been eliminated.

The interior has been equipped with

a view particularly toward supplying passenger comfort and attractive appearance. Green plush upholstered cross seats, white maple grooved floor, shaded side and center lights, and oscillating fans at either end are some of the interior features.

Electro-pneumatically operated sliding doors, with automatic interlock switches inclosed in the rubber bumper, have been provided at the ends of the car. Control switches for operating these doors are mounted on the outside of the dash at each end of the car and so arranged that the guard may open the doors at both ends of the cars.

All the new cars will be motor cars with two motors on each car, both located on one truck. The motor truck has a wheelbase 12 in. longer than that of the dead truck.

Following out the plan which originated some months ago, the new cars are painted orange above the belt rail and a brilliant green below the belt rail, with the sash and doors also painted green.

### PRINCIPAL DIMENSIONS OF NEW CHICAGO "L" CAR

Length over bumpers	48 ft. 0 in.
Width over drip rails	8 ft. 10 <sup>7</sup> / <sub>8</sub> in.
Height, top rail to top roof, light	12 ft. 3 <sup>1</sup> / <sub>2</sub> in.
Truck centers	33 ft. 8 in.
Wheel base of trucks (trailer end)	5 ft. 6 in.
Wheel base of trucks (motor end)	6 ft. 6 in.
Wheel diameter	34 in.
Seating capacity	48
Door width	3 ft. 8 in.
Aisle width	21 <sup>1</sup> / <sub>2</sub> in.
End wall width between longitudinal seats	4 ft. 0 <sup>1</sup> / <sub>2</sub> in.
Seat width	40 in.
Seat spacing	2 ft. 8 <sup>1</sup> / <sub>2</sub> in.



More Comfort and Attractiveness Are Features of New Chicago "L" Cars



## Ten Cents Cash Asked

Atlanta Company Says It Can't Continue Under Present Conditions—Wants Jitneys Curtailed

An increase in single cash fares from 7 to 10 cents is being sought by the Georgia Railway & Power Company, tickets to remain at their present price of 6½ cents each if bought in strips. The company desires to charge 2 cents for transfers. It wants jitneys eliminated from streets; way now operates and desires to do away with unnecessary car stops. These are some of the things requested in a petition filed by the company with the Atlanta City Council, on Dec. 1.

The petition states:

If present conditions continue, there will shortly be no margin of profit left to the company after operating expenses have been paid, and the ability of the railway to maintain the present transportation service will be ended—a condition which has never before existed in Atlanta, but which can be prevented by the plan submitted in this petition.

Already the credit of the railway is exhausted and not one dollar of additional capital can be borrowed either for the purpose of improving existing mileage or for making extensions.

The railway business can be put on a living basis by increasing the number of passengers carried, by lessening the cost of operation, or by increasing the fare per passenger.

As we cannot increase the number of passengers carried or decrease the cost of operation, the only thing left to do is to increase the fares.

Jitney competition is unfair. If continued it will subject the railway to such losses that it will be forced to discontinue operation. Jitneys should not be licensed except where the necessity for them is shown.

Ten cents cash fare is asked because the cost of furnishing railway service has more than doubled since 1914. Car riders will pay no increase in fare if they buy tickets.

A 2-cent charge for transfers is asked because the cost of furnishing service has more than doubled.

No service should be furnished free. Free service can only be given at the expense of those who pay the fares.

The management should be vested with reasonable authority in eliminating unnecessary car stops. The car stops in Atlanta are unnecessarily frequent and prevent quick, reliable service as well as increase the cost of the service.

The petition also asks the removal of all the indirect and special taxes assessed against the railway and its property, declaring that these taxes must ultimately be levied against the passengers, since the only money received by the company with which to pay taxes comes from the fares received by its passengers.

It asks that railway property in Atlanta be taxed only on an equal basis with other classes of property in the city.

The petition closes with the statement that the company is interested only in making a reasonable profit on its investment, and in rendering the best service possible to the people of Atlanta.

## Indiana Interurbans to Use Buses

Extensive operation of buses is being planned by electric railways in Indiana to meet competition from lines independent of the railways. The Interstate Public Service Company and the Indianapolis & Cincinnati Traction Company are operating buses now as

feeders and the present bus systems will be extended. As noted elsewhere in this issue the I. & C. has closed a contract for bus service to connect Versailles, Osgood and Greensburg, to be operated in conjunction with the traction lines. Several bus lines now carry passengers from small towns and farms to the cities and stations of the Interstate Public Service.

## Buses May Have to Be Withdrawn in Louisville

James P. Barnes, president of the Kentucky Carriers, Inc., Louisville, Ky., subsidiary of the Louisville Railway, stated on Nov. 30 that the present city bus service would probably be abandoned unless the public supports the local lines better. At the present time the bus service is not earning more than 60 per cent of operating costs, and very little improvement has been shown in earnings since the recent change in the operating schedules. The fact that the idea of service by bus is new and that the public has not become accustomed to the service are regarded as partly responsible for lack of patronage.

## Flood at Oklahoma City Causes Influx of Jitneys

Jitney competition menaces the Oklahoma Railway. Following the destruction by flood of the bridge and a half mile of fill on the right-of-way between Oklahoma City proper and the section of the city known as Capitol Hill, city and Norman interurban cars had to be rerouted via Packingtown. This involved serious delay to traffic and automobiles began carrying passengers between Capitol Hill and the city for 10 cents. The railway facilities were restored with the opening of the new bridge over the North Canadian on Dec. 3, but the city attorney announces that there is no legal barrier on the ordinance books of the city preventing the operation of jitneys.

Will Establish Safety Zones.—The Trenton-Mercer County Traction Corporation, Trenton, N. J., will establish safety zones and mark trolley stops with lights along part of Pennington Road.

Enforcement of Ordinance Against One-Man Cars Postponed.—A measure approved by the electorate of Dayton, Ohio, early this fall, placed in immediate effectiveness theoretically, a ban on the one-man car. Jan. 1 is the date tentatively set by the city for enforcing the measure, but in the event the companies cannot make the physical changes in their property by this time, it has been indicated that the date will be extended. Indications are said to point to an arrangement being made which will permit the cars to remain in service under conditions of street traffic more favorable than those that now exist.

Higher Rates Sought.—The United Electric Railways, Providence, R. I., has

applied to the Rhode Island Public Utilities Commission for permission to raise its fares so as to give nine rides for 50 cents. The rate at present is ten rides for 50 cents. Single fares are to remain at 6 cents. The reason given by the company in its request for increased rates was that receipts were running behind operating expenses.

"Transportation" Appears.—The National Transportation Institute is publishing, each Tuesday, a new pamphlet, entitled "Transportation." In its relation to all industries, the subject of transportation is covered in detail in this sheet. Number 4 of Vol. 1 tells what the National Transportation Institute really is. It explains in an editorial that the institute represents the business men's solution of the transportation problems of the United States. Further, that its purpose is to aid the public in understanding the business problems of transportation, in order that growth of agriculture and industry may continue. The paper is dated Chicago.

Bus Operation Started.—Operation of its first auxiliary motor bus line was started Nov. 6 by the Springfield Railway, Springfield, Ohio, the bus operating in Melrose addition and connecting with the Yellow Springs Street cars. Service will be extended by the company if found desirable after the tentative schedule has been given a trial.

Provisions Made for First Class Mail.—First class mail out of Salt Lake City will be carried into Provo by the Orem Electric Railroad within a short time. Arrangements are now being made looking toward converting the interurban into a mail carrier road.

Saving Time in Evening Rush.—The Grand Rapids Railway, in order to speed up accommodations during the evening rush, has ruled that no fares shall be collected from patrons on entering out-bound one-man cars. It is said much time is saved and traffic does not pile up in the downtown section if patrons are hurried directly into the cars during the rush hour. Fares are paid as patrons leave.

First Cattle Cars Moved.—The first electric-way shipment of livestock from Louisville to Indiana markets by means of the new tracks of the Interstate Public Service Company, entering directly into the Bourbon Stock Yards in East Louisville, was consigned on Nov. 12. On that date an electric locomotive pulled out of the yards with three cars of cattle for Indianapolis and three destined for Frankfort, Ind. The six cars contained an average of thirty head of cattle each. The rates, it is said, will be about on a par with railroad transportation charges, but delivery is speedier due to direct movement and elimination of loss of time by switching.

Railway Explains.—The Louisville Railway is running a series of advertisements in the Louisville newspapers in an effort to explain to the public just why the company is not always able to serve its patrons as it would like to serve them.



**Certificate Refused.**—Because adequate freight service is being given over the route from Oklahoma City to El Reno and Geary, the Oklahoma Corporation Commission refused to grant a certificate of convenience and necessity to the Highway Transfer Company to operate motor car freight lines. One of the objectors to the granting of this certificate was the Oklahoma Railway, That company contended its own lines had established stops about every half mile where freight was received and discharged. The order became effective Nov. 21, 1923.

**Bus Contract Helps Service.**—Inter-urban facilities of the Indianapolis & Cincinnati Traction Company have been extended by the closing of a contract for bus service in Versailles, Osgood and Greensburg. An announcement of this service was made by Hudson R. Biery, assistant to President Henry.

**Company Shows Its Progress.**—The Galveston Electric Company, in an advertisement in the annual trade edition of the Galveston *Daily News*, presented "The Old and the New" in railway operation in Galveston. Two pictures were reproduced. One showed the old-time mule car, while the other showed one of the new one-man safety cars recently put in use in Galveston. The aims and ideals of the traction company are then set forth briefly by R. G. Carroll, local manager at Galveston.

**Increased Fares Sought.**—The Hannibal Railway & Electric Company, Hannibal, Mo., has filed an application for increased fares with the Missouri Public Service Commission. A hearing on the petition will be held in Jefferson City, Mo., on Dec. 11. The company estimates the increase would net it approximately \$1,800 a year. Increased cost of labor and materials is given as the reason for the application.

**Traffic Model Will Tell Story.**—The Springfield, Mass., Police Department has introduced an adjustable traffic model which is recommended by the American Automobile Association for adoption by courts throughout the country in trying cases arising from street accidents. An improved form of this model was used at an inquest in Springfield recently for the first time. It is provided with miniature street cars, tracks, poles, wires, hydrants, trees, automobiles, vehicles and pedestrians, which can be so placed as to illustrate any kind of street accident. The model is 3 ft. long by 20 in. wide and rests on a wooden base. It has movable sidewalks and intersecting streets. To show an accident on a street without street car lines a metal covering is made to fit over the tracks. Policemen are instructed in the case of every accident to secure the measurements in order to show correctly to the judge and jury the relative positions of the various parties and factors concerned. It has been found that the use of the model saves time and expense in trying cases, particularly as its use does away with the need for special drawings.

## Legal Notes

### ALABAMA—*Waiting Passengers Include Others Than Those Who Signal the Car to Stop.*

Where an interurban car stops to receive passengers the invitation to board the car is not limited to those who signaled for the car to stop. Hence, a person attempting to board the car at such a point and having his hand injured when the door was being closed has cause for action. [Mobile Light & R. Co. vs. Ellis, 96 Southern Rep., 773.]

### INDIANA—*Jury Qualified to Pass on Adequate Bonding.*

Where plaintiff's horse ran away while crossing a railroad, claimed due to an electric shock, an instruction that the jury, in determining whether the bonding of defendant's rails was defective and whether there was a leakage of electrical current, should consider whether the earth near the crossing was charged with electricity and whether the electric current would leak from the rails if the bonding was in good condition, and whether other horses suffered an electric shock at the crossing under similar circumstances, and whether electric sparks or flashes were seen at the joints of the rails at the crossing, and, if so, whether that indicated defective bonding, in so far as those matters were shown in evidence together with all the other evidence upon the question held not reversible error under the evidence. [Indianapolis & Cincinnati Traction Co. vs. Montfort, 139 Northeast Rep., 677.]

### KENTUCKY—*Third-class City Cannot Grant Franchise Without Requiring Company to Pave Between Tracks.*

The limitation of Ky. St. Sec. 3290, upon the power of third-class cities in granting street railway franchises which prohibits such franchise without requiring the company to pave between the tracks, is mandatory. Hence a franchise granted without such requirement, either expressed or implied, would be void. The provisions of Sec. 3450, relating to the assessment of such cost where the payment is required by the franchise, applies whether the requirement is expressed or implied. [City of Henderson vs. Henderson Traction Co., 254 Southwest Rep., 332.]

### MISSOURI—*Penal Statute Held Not to Deny Equal Protection or Due Process.*

Rev. St. 1909, Art. 5425, providing that, when any person shall die from injury resulting from negligence in running any car or train, the corporation shall forfeit and pay as a penalty the sum of not less than \$2,000 and not exceeding \$10,000, construed as wholly penal and as authorizing recovery of

maximum amount, though there is no pecuniary loss, does not deprive railway company of equal protection of the laws, or due process of law, in violation of Const. U. S. Amend. 14. [Grier vs. Kansas City, C. C. & St. J. Ry. Co., 254 Southwest. Rep., 359.]

### NEW YORK—*That Car in Collision Was of the One-man Type Held Properly Commented On.*

In an action against the railway company for damages, it was proper for plaintiff's counsel to call the attention of the jury to the fact that the car concerned in the collision was of the one-man type and to point out the duties of the operator in a car of the type used, although there was no contention that the failure to have a conductor on the car was a proximate cause of the accident. [Christman vs. Union Railway, 200 New York Sup., 800.]

### OHIO—*Commission Authorized to Deny Application for Issuance of Securities Based on Overvaluation.*

Under Gen. Code, Secs. 614-53 to 614-55, authorizing the Public Utilities Commission to supervise the issue of securities by utilities and railroads, such commission is authorized to deny an application for the issuance of securities based upon an overvaluation, or upon which a fair return may not be probably realized or reasonably expected. [Lima Toledo R. Co. vs. Public Utilities Commission, 140 Northeast. Rep., 603.]

### PENNSYLVANIA—*Obligation to Maintain Paving Not Removed by Offer to Surrender Right-of-Way on Street.*

A street railway company is not relieved of obligation, assumed as condition of right to occupy a street, to repair the street because of its receipts being reduced by a subsequent grant by the borough to another company to occupy a parallel street and by another company with which it had had connection passing into the hands of another at foreclosure sale. It is also not relieved of its obligation by an offer to surrender its right on the street and remove the tracks, though it cannot be compelled to continue indefinitely operations at a loss. If it desires to surrender all its powers and franchises and cease its corporate existence, it may make application under P. L. 293; Pa. St. 1920, sec. 5791. If it merely desires to abandon part of its line, thereby affecting service, the determination of the question is for the Public Service Commission, to which is committed the regulation of service. [Borough of Norristown vs. Reading Transit & Lt. Co., 121 Atlantic Rep., 495.]



## New Publications

### Workmen's Compensation Legislation of United States and Canada—1920-1922

Bulletin No. 332 of the United States Bureau of Labor Statistics, Workmen's Insurance and Compensation Series. Government Printing Office, Washington, 1923.

This bulletin gives a summary of legislation in force on the subject of compensation, which has been enacted in the years covered, followed by an appendix giving the exact text of all laws passed, or of amendments to previously existing laws. It is issued strictly as a supplement to an earlier bulletin, No. 272, which covered the legislation in force at the end of the calendar year 1919.

### Ball Test Applied to Cement Mortar and Concrete

By R. E. Crepps and R. E. Mills. Bulletin No. 12 of the Engineering Experiment Station at Purdue University. Published by Purdue University, Lafayette, Ind.

This bulletin describes a method of testing concrete, particularly for highway construction, by means of a steel ball in a manner similar to the Brinell method of testing, which has been generally accepted as a reliable index of the mechanical properties of steel. According to the authors, the ball test affords a valuable and convenient means of determining the compressive strength, provides a reliable index of strength for any age or mix, allows material in place to be tested and provides a new means of studying questions in connection with concrete pavements. Such questions include the effect of wheel loads upon surface strength, the effects of different types of tires upon surface strength, the effect of tire inflation upon surface strength, the distribution of damage on any area of contact, the effect of impact and the recovery of surface strength. Methods of making the test and the procedure involved are described.

### Workmen's Compensation Acts in the United States—The Medical Aspect

Research Report No. 61 of the National Industrial Conference Board, New York City. 282 pages.

This volume is a discussion of the medical side of workmen's compensation. The importance of the questions on this subject has been emphasized largely by the inclusion of diseases of occupations in later revisions of compensation laws, and also by the granting of compensation for diseases having only a casual and sometimes remote connection with the occupation or with the original injury. The needed medical experience is now available in the records of decisions of industrial boards and commissions and of the courts. These decisions have been carefully studied by the National Industrial Conference Board and the principles and practices developed have been analyzed in this report. Various types of injury and diseases resulting from accidents are treated in detail. In connection with the study, reference is made to some 800 reported cases.

## Personal Items

### Samuel Rea Elected President of Long Island Railroad

The board of directors of the Long Island Railroad elected on Dec. 5 Samuel Rea as president of the company, to succeed Ralph Peters, deceased. This is in accordance with the policy that has been pursued on the Pennsylvania Railroad System for several years, that the president of the Pennsylvania Railroad Company shall also act as president of the principal companies in the system.

George LeBoutillier continues as the vice-president of the company, resident in New York, in special charge of the operations of the road and all questions relating to its improvement and service, and of the various departments dealing with all features of the company's operations, except finance and accounting. These latter features are under the supervision of the vice-presidents at Philadelphia, as was the case during Mr. Peters' administration.

C. J. Quill has been appointed to the position of transportation salesman of the Tacoma Railway & Power Company, Tacoma, Wash.

Walter A. Shaw has been appointed by Mayor Dever as the city representative on the Board of Supervising Engineers, Chicago Traction, and his appointment approved by the City Council. Mr. Shaw was formerly engineer of the Illinois Public Utilities Commission, later acting in the capacity of consulting engineer for the city of Chicago and more recently as advisory engineer to the Lincoln Park Board.

Samuel T. MacQuarrie has been appointed director of the New England Bureau of Public Service Information, with headquarters at 24 Milk Street, Boston, Mass. Mr. MacQuarrie has been associated with the banking house of Curtis & Sanger, Boston, and for about twenty years was employed by the Fore River Shipbuilding Corporation at Quincy, Mass., and later by the succeeding Bethlehem Shipbuilding Corporation, Ltd., as assistant to the works manager, and in charge of publicity prior to the Bethlehem acquisition. He succeeds Joseph B. Groce who has joined the staff of the Edison Electric Illuminating Company, Boston.

Frederick Rollins Low, since 1888 editor of *Power*, a McGraw-Hill publication, was inducted as president of the American Society of Mechanical Engineers at the convention held in New York during the week ended Dec. 8. Mr. Low has been active in the affairs of the American Society of Mechanical Engineers since becoming a member in 1886. He served as vice-president of the society in 1918. He will be the delegate of the association to the World Power Conference in London.

Joseph A. Whitlow, formerly connected with the Pine Bluff Company, Pine Bluff, Ark., and superintendent of the Alapco division, has been appointed manager of the Tulsa properties of the Public Service Company of Oklahoma. Mr. Whitlow went to Alapco early in 1919, succeeding the late Minor Q. Woodward with the Pine Bluff Company. His resignation became effective on Dec. 1.

William C. Wheeler has been appointed engineer of equipment Chicago Surface Lines, succeeding Charles Gordon, who resigned some months ago to become Western editor *ELECTRIC RAILWAY JOURNAL*. For the past two and one-half years Mr. Wheeler has been employed in the railway motor engineering department of the General Electric Company at Schenectady. He is a graduate of the school of engineering, University of Missouri, and has done considerable work in the shops of street railway companies and the Union Pacific Railroad at Sedalia, Mo.

J. L. Longino, vice-president and general manager of the Arkansas Light & Power Company, was recently elected president of the Arkansas Utilities Association at its sixteenth annual convention. It was early in the current year that Mr. Longino was made vice-president and general manager of the Arkansas property, advancing to that position from the one of operating superintendent. Two years prior to this he had been made manager of the Pine Bluff Company, an associated public utility which operates the electric railway, power and water services in Pine Bluff. His promotion of this year did not alter his association with the Pine Bluff Company as general manager, although he was relieved of some duties by L. B. West, auditor of the company.

## Obituary

William H. Burk, secretary, treasurer and auditor of the Waterloo, Cedar Falls & Northern Railway, died suddenly at his home in Waterloo, Iowa, recently. He had been ill for the past two years. Mr. Burk was connected with the Chicago Great Western for some time, being general Eastern agent in New York City before going to Waterloo twelve years ago.

Alex G. Drury, Jr., nationally known mechanical and electrical engineer, died at his home in Cincinnati on Nov. 29. For the past ten years Mr. Drury had been engineer for the Cincinnati, Newport & Covington Light & Traction Company, which leases the electric railway systems in Covington and Newport, Ky., to the Cincinnati, Newport & Covington Street Railway, a subsidiary of the Columbia Gas & Electric Company. He was thirty-eight years old.



## Manufactures and the Markets

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

### Much Welding Being Done

Manufacturer Reports Substantial Increase in Use of Thermit Process

Tangible evidence is at hand that track reconstruction work has continued at a fast pace during the year now drawing to a close. It will be recalled that more miles of track were rebuilt during 1922 than in any year previously recorded. The complete figures for 1923 will not be available for several weeks, but the pace that has been set is indicated from sources other than the railways themselves.

Among the manufacturers of track material reporting very satisfactory business this year is the Metal & Thermit Corporation. Its railway business has been 50 per cent greater this year than the best year. Not only this, but the company reports a substantial increase in the number of customers. To be more nearly exact, it had on its books this year three times as many customers as last year.

This expansion is attributed by the company to two things: (a) the constantly growing appreciation of the value of the Thermit rail weld and (b) the reduction in cost of installation through economies effected in carrying out the process. This cost, the company now reports, has been so reduced that it compares favorably with any other method of joining rails.

Perhaps the biggest order of the company has been for material for from 5,500 to 6,000 joints. This, by the way, was from a company still in receivership. This simply reflects again that the electric railways are rehabilitating strongly, even where the company may be in receivership.

Another large order received by the company was for material for about 5,000 joints. These, of course, are some of the outstanding installations. Orders for material from 1,000 to 3,000 joints have been plentiful.

The Metal & Thermit Corporation is more than optimistic about the prospects for business in the electric railway field in 1924. Its business, in this field is, of course, only a small part of the entire output of the company. In other lines, notably steam railway work, it also reports a substantial growth in business.

### New Radial Line in Toronto in Prospect

The first spike was driven recently on the track to be laid by the Toronto Eastern Railway which was the initial step in the operation of a new radial

line running from Bowmanville to Toronto. It is expected that the line will be in operation by the end of next summer. Construction of the line was started in 1914. At that time the work was begun by the Canadian Northern Railway, but will be finished by the Canadian National Railways. When the war came construction activity ceased, but since that time Canadian National engineers have been occupied with working out the completion of the project. Originally tracks on the proposed radial were laid from Bowmanville to Whitby and grading on the right of way was completed from Whitby to Pickering, but the rails on the latter part were not laid. About a year ago Sir Henry Thornton, president of the Canadian National Railways, announced that he would have the road extended to Toronto and operated as a fast electric railway. Many distinguished people, including railway officials, were present at the ceremony of commencing the new rails.

### Standardization Being Accomplished by Germans

The extent to which industrial life in Germany has been coordinated, it is said, is shown by the fact that more than 700 German national standards have been adopted. In addition to the work of the central body there are no less than sixty-five special industry committees actively working on such subjects ranging from the standardization of pipe fittings to sheet paving material and railway car construction.

A striking example is cited of the efficiency of national standardization as it has been developed in Germany in the case of a rush order placed with German manufacturers for 200 locomotives for delivery to Russia. Production of different parts was allotted to seventeen different manufacturers to be produced strictly upon the plan of interchangeable parts, no one manufacturer making a complete locomotive. No serious practical difficulty was encountered in filling the order. The inspectors made a particularly striking test of the feasibility and accuracy of the plan by ordering a complete locomotive to be assembled from parts chosen at random from the parts furnished by the seventeen manufacturers. It proved to be ready for service immediately after assembly without the necessity of any disassembling for readjustment.

"The extent to which Germany has so far succeeded in keeping her industrial machine intact is due in no small part to the elaborate scale on which her standardization work is performed."

So states Dr. P. G. Agnew, secretary of the American Engineering Standards Committee, in a bulletin which he has prepared for the committee.

### Brill Declares Dividend

A disbursement of 1½ per cent was made on the common stock of the J. G. Brill Company on Dec. 1. The amount of outstanding common stock is \$4,810,000, on which there were no dividends paid from 1908 until March 1, 1923, when a disbursement of 1½ per cent was made. This dividend has been paid quarterly since. The price range of the common stock has been as follows:

	High	Low
1917.....	33	10
1918.....	27	18
1919.....	64½	19½
1920.....	63	24
1921.....	56	25
1922.....	59	36
1923.....	91	49

This year the company has had good business, the direct result of increased purchases by public utility companies.

### Lumber Conference Reaches Conclusions

It is expected that trade in lumber products in various countries will be facilitated following the recent European Lumber Conference held in Bratislava. At the conference it was decided to establish a permanent European commission, composed chiefly of reputable lumber exporters, to which would be assigned the task of establishing a lumber trade Court of Arbitration. In the case of dispute and on appeal by both parties this court would render decisions which would be final and binding. A second decision of the conference contemplates the formation of a European association to be composed of the various European lumber trade associations. The conference considered also the matter of standardization of lumber sizes and classification, but took no definite action in this direction. Besides the Czech delegation there were present representatives from France, Italy, Austria, Germany, Holland, Switzerland, Hungary and Rumania.

### Metal, Coal and Material Prices

Metals—New York		Dec. 4, 1923
Copper, electrolytic, cents per lb.....		13.125
Copper wire base, cents per lb.....		15.50
Lead, cents per lb.....		7.00
Zinc, cents per lb.....		6.70
Tin, Straits, cents per lb.....		47.00
Bituminous Coal, f.o.b. Mines		
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....		\$4.625
Somerset mine run, Boston, net tons.....		2.125
Pittsburgh mine run, Pittsburgh, net tons..		2.00
Franklin, Ill., screenings, Chicago, net tons..		1.575
Central, Ill., screenings, Chicago, net tons...		1.35
Kansas screenings, Kansas City, net tons...		2.00
Materials		
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....		\$6.65
Weatherproof wire base, N. Y., cents per lb.		17.00
Cement, Chicago net prices, without bags..		\$2.10
Linseed oil (5-bbl. lots), N. Y., per gal.....		\$0.95
White lead, in oil (100-lb. keg), N. Y., cents per lb., carload lots.....		11.25
Turpentine, (bbl. lots), N. Y., per gal.....		\$0.93



### Victorian Railways Invite Bids

The Victorian Government Railways, Melbourne, Australia, is inviting bids on the following machinery and equipment: Spring coiling machine and necessary equipment, including electrical motive apparatus; paper rolling machine, including electrical motive apparatus; combination turret lathe, including leading screws and nuts and taper-turning attachment; gear-cutting machine; automatic cross-cut saw; cross grooving and trenching machine; planing and thicknessing machine, including side cutters. A copy of the specifications covering this equipment may be consulted by interested manufacturers at the Boston or New York district offices, or at the Cincinnati co-operative office. Bids will close at Melbourne on Jan. 9, 1924.

### Rolling Stock

Fort William Electric Railway, Fort William, Ont., during 1923 remodeled two single-truck and one double-truck one-man cars.

West Chester Street Railway, West Chester, Pa., built and rebuilt in the railway shop during 1923 four interurban two-man cars.

New York, N. Y.—The department of Plant and Structures is considering the purchase of new cars to supplement present service on the Williamsburg Bridge and also to provide for other service that will likely be taken over by the city.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., during 1923 ordered two city double-truck two-man cars and one interurban two-man car.

Spokane United Railways rebuilt four one-man cars during 1923.

Salt Lake & Utah Railroad, Salt Lake City, rebuilt or remodeled during 1923 three insulated box cars, one tank car and one flat car.

Indiana County Street Railways, Indiana, Pa., ordered from the Kuhlman Car Company in 1923 three interurban double-truck two-man cars.

Northern Texas Traction Company, Fort Worth, during 1923 ordered from the American Car Company ten double-truck one-man cars. Twenty-two cars were remodeled, the Cincinnati Car Company remodeling twelve city motor double-truck one-man cars and the St. Louis Car Company rebuilding ten.

San Francisco, Napa & Calistoga Railway, Napa, Cal., during 1923 ordered from McGuire-Cummings one interurban steel locomotive double-truck car and one work car from the Pacific Car & Foundry Company.

Quebec Railway, Light & Power Company, Quebec, during 1923 ordered of the Ottawa Car Manufacturing Company, Ltd., ten single-truck one-man cars. Ten double-truck two-man cars were rebuilt.

Sacramento Northern, Railroad, Sacramento, Cal., ordered during 1923 two electric locomotives from the General Electric Company.

Worcester Consolidated Street Railway, Worcester, Mass., during 1923 ordered ten double-truck two-man cars for city service from the Osgood-Bradley Car Company.

### Track and Line

Trenton & Mercer County Traction Corporation, Trenton, N. J., will remove its switcn on Brunswick Avenue to Harney's Corner in Lawrence Township.

Toronto Transportation Commission built in 1923 7.152 miles of new single track in pavement and rebuilt 7.774 miles.

Salt Lake & Utah Railroad, Salt Lake City, during 1923 increased its side tracks by 5,553 ft. of track none of which was in paved streets.

Alabama Power Company, Gadsden, Ala., will rebuild the Cansler Street line from Ninth Street to a point on Twelfth Street. Seventy-pound rail will replace the 40-lb. rail and the street occupied by the car line will be repaved. The Cansler Street improvement will cost from \$12,000 to \$15,000. Work is progressing on the rebuilding of the car line trestle over Black Creek on the Attalla line.

Wisconsin Public Service Corporation, Green Bay, Wis., rebuilt in 1923 2,500 ft. of city single track paved and raised to level with new ties and ballast.

Pittsburgh Railways built during 1923 0.467 miles of city single track and 0.025 miles of interurban track in pavement. In open construction there was built 0.171 miles of city track and 0.062 miles of interurban. The company rebuilt 34.326 miles of city track and 0.911 miles of interurban track in pavement and in open construction 1.028 city miles and 1.826 interurban miles.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., will extend the Wyatt Park line tracks 1,700 ft. on Thirty-third Street. An agreement to this effect was reached recently following a conference with the park board members and S. B. Irelan, general manager of the company.

### Power Houses, Shops and Buildings

Sydney, Australia.—The railway commissioners are now receiving bids and placing orders for the power plant equipment, including a number of large turbo-generators and boilers for the electrification of the Sydney Suburban Railways. When installed the generating units will be the largest in Australia, each being of 20,000-kw. normal rating. It is expected that the electrification of the first section of the Suburban Railway system of Sydney will be completed by March, 1925.

### Trade Notes

Morton Manufacturing Company, Chicago, manufacturers of the Acme line of railway appliances, has just completed an addition to its Chicago factory, giving it 18,000 sq.ft. of additional floor space.

Walter N. Ballou has been appointed manager of the transportation division of the Atlanta office of the Westinghouse Electric & Manufacturing Company. He will have charge of the light and heavy traction business of the company in that territory.

Western Electric Company, New York, N. Y., has announced important organization changes which involve the appointment of three new assistant works managers and two superintendents in the manufacturing department. These changes are part of a program of expansion being carried out in the new Western Electric works at Kearny, N. J., which in their ultimate development may duplicate the tremendous plant at Chicago. C. L. Rice, formerly production superintendent of the Hawthorne works at Chicago, and S. S. Holmes, general superintendent of installation of the installation department, have been promoted to assistant works managers at Hawthorne. R. C. Dodd, at present operating superintendent of the Hawthorne works at Chicago, has been promoted to assistant works manager at the new Kearny, N. J. works. This appointment is effective March 1, 1924. Other changes are as follows:

J. J. McKenna, formerly assistant general purchasing agent at Hawthorne, succeeds Mr. Rice as superintendent of production and W. H. Meese, supervisor of installation methods and results, succeeds Mr. Dodd as operating superintendent at Hawthorne.

### New Advertising Literature

Linde Air Products Company, New York, N. Y., has just published an illustrated booklet of 122 pages fully describing the latest methods for various kinds of work. It states that the keynote of successful cast-iron welding is a thorough understanding of the necessity for adequate preheating, proper welding practices and suitable annealing. In many shops the application of advanced methods has accomplished saving in money, labor and time.

Ohio Brass Company, Mansfield, Ohio, has issued a pamphlet called "How to Save Time, Money and Temper!" "Cam yourself, Bill, cam yourself" tells about the advantages of using cam tips. These cam tips can be found not only on frogs but on Ohio Brass crossings, section insulators, strain plates, etc. The circular says that you can "cam up" your whole system, save time, money and temper and have all the cars rolling all the time.





**Rapid Transit — Safe Transit**

The huge subway cars of the New York Municipal Railway, each of which usually carries well over a hundred passengers, annihilating space at fifty miles an hour, are equipped with every kind of emergency safety device. These include—

**PEACOCK  
Improved Brakes**

*Specified by Engineers*

It is no mere coincidence that Peacock Brakes are almost always found on rolling stock which has been designed under the independent direction of technical and engineering experts.

Such men do not specify brakes on guess work or some one's else say so; they figure the braking forces neces-

sary to stop a car from maximum speed in the shortest possible distance—in other words the maximum braking force which the wheels will take without skidding. Then they specify brake equipment which is designed to accomplish this result.

*That means the Peacock Brake.*

**Peacock Improved 12-52**

The 12-52 gear ratio Peacock hand brake is the one with ample braking power for the heaviest city, interurban and rapid transit cars.

There is a proper size and type of Peacock Brake for every type of car and class of service.



**NATIONAL BRAKE CO.**

890 Ellicott Square  
Buffalo, New York

CANADA: Lyman Tube & Supply Co., Ltd., Montreal



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## Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York  
PHILADELPHIA CHICAGO SAN FRANCISCO

## THE J. G. WHITE ENGINEERING CORPORATION Engineers—Constructors

Industrial Plants, Buildings, Steam Power Plants, Water  
Powers, Gas Plants, Steam and Electric Railroads,  
Transmission Systems  
43 Exchange Place, New York

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ON  
INDUSTRIAL AND PUBLIC SERVICE PROPERTIES

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## THE ARNOLD COMPANY

ENGINEERS—CONSTRUCTORS  
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105 South La Salle Street  
CHICAGO

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Engineer—921 Fifteenth St., WASHINGTON, D. C.

### TRANSPORTATION

Complete Transit Surveys and Development Pro-  
grams, adapting Motor-Transport, R.R. Terminal and  
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## ALBERT S. RICHEY ELECTRIC RAILWAY ENGINEER

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Consulting Transportation Engineer

Specializing in Traffic Problems and in Methods to  
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Design and Construction of Power Stations  
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Engineers—Constructors—Managers

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1570 Hanna Bldg.

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84 Pine St.

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## DAY & ZIMMERMANN, INC.

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Reports, Valuations, Management

NEW YORK PHILADELPHIA CHICAGO

## WALTER JACKSON

Consultant on Fares, Buses, Motor Trucks

Originator of unlimited ride, transferable weekly  
pass. Campaigns handled to make it a success.

143 Crary Ave., Mt. Vernon, N. Y.

The Most Successful Men in the Electric Railway  
Industry read the

ELECTRIC RAILWAY JOURNAL

Every Week



**EDWIN WORTHAM, E.E.**  
*Consulting Engineer*  
 Valuations of Electric Railways and  
 Utilities of All Kinds  
 Traffic and Operating Studies  
**Allison Bldg. Richmond, Va.**  
 Established Feb. 1913.

<b>C. B. BUCHANAN</b> President	<b>W. H. PRICE, JR.</b> Sec'y-Treas.	<b>JOHN F. LAYNG</b> Vice-President
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**BUCHANAN & LAYNG CORPORATION**  
*Engineering and Management, Construction,  
 Financial Reports, Traffic Surveys  
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**BALTIMORE** Phone: **NEW YORK**  
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**JAMES E. ALLISON & CO.**  
 Consulting Engineers  
 Specializing in Utility Rate Cases and  
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**KELLY, COOKE & COMPANY**  
 Engineers  
 149 BROADWAY NEW YORK 424 CHESTNUT STREET  
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**Transmission Line and Special Crossing  
 Structures, Catenary Bridges**  
 WRITE FOR OUR NEW DESCRIPTIVE CATALOG  
**ARCHBOLD-BRADY CO.**  
 Engineers and Contractors SYRACUSE, N. Y.

The Most Successful Men in the Electric Railway  
 Industry read the  
**ELECTRIC RAILWAY JOURNAL**  
 Every Week

**THE P. EDWARD WISH SERVICE**  
 50 Church St. Street Railway Inspection 131 State St.  
**NEW YORK DETECTIVES BOSTON**

When writing the advertiser for information or  
 prices, a mention of the Electric Railway  
 Journal would be appreciated.

# Free Holiday Stamping Offer

Until January 1, 1924 we will stamp your name, or a friend's name, in gold on the front cover of the Standard Handbook for Electrical Engineers. Remittances should accompany orders and books stamped are, of course, not returnable.

This is not merely a chance to get a book with your name stamped on it. It is rather an opportunity to get a book that you need—a book so helpful—so handy—so valuable that you will want it to be made your own in this way.

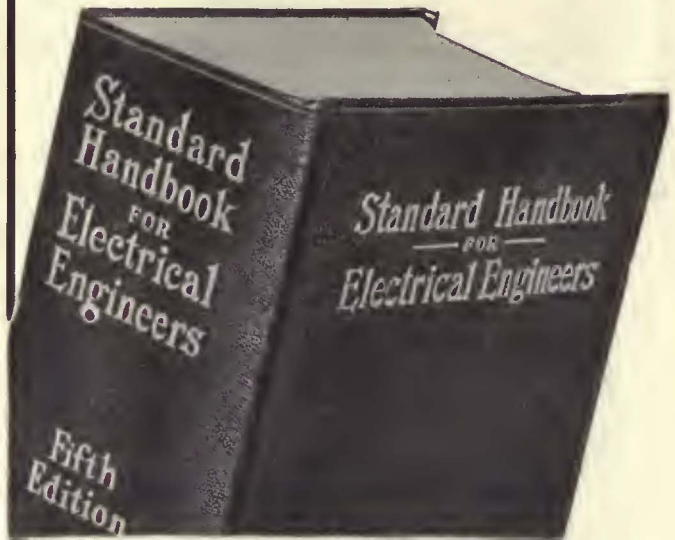
## Standard Handbook for Electrical Engineers

2100 pages, 4½x7, flexible,  
 thumb-indexed, illustrated, \$6.00 net, postpaid

The Standard really adds another hour to your working day—an hour that you spend in searching for reference data that you constantly need—or for material that you need only occasionally—or in thinking out a formula—or in trying to recall a particular equation.

Someone has said that an electrical engineer gets only seven hours' work out of eight hours' labor—when he works without the Standard, and there's a lot of truth in it.

You may have the Standard stamped—or you may have it unstamped for 10 days' free examination. One way or the other—stamped or unstamped—get it—you will use it constantly.



### Free Holiday Stamping Offer

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York, N. Y.

A—Send me the Standard Handbook for Electrical Engineers with name stamped in gold on front cover. I enclose proper remittance and understand that stamped books are not returnable

(Name to be stamped)

B—Send me for 10 days' free examination the Standard Handbook for Electrical Engineers, \$6.00. I agree to remit for the book or to return it postpaid within 10 days of receipt.

Regular subscriber to Electric Railway Journal? .....

Signed .....

Address .....

Official Position .....

Name of Company .....

(Books sent on approval to retail purchasers in the U. S. and Canada only.)

E. 12-8-23



# How the Dayton

## 2

The 1923 Committee on Way Matters of the A.E.R.A. reported at the Atlantic City convention as follows:

*"It was agreed that a substitute tie should meet the following requirements:*

- |  |   |   |
|--|---|---|
| 1. Resiliency.   | → | The fundamental principle of the DAYTON RESILIENT TIE.  |
| 2. Hold rail to gage.  | → | Held securely by bolts accurately located in steel cross members.   |
| 3. Provide sufficient bearing area.  | → | By protecting the concrete from breaking or pulverizing, the Dayton Tie converts the entire roadbed into bearing surface. |
| 4. If expected to last for more than one set of rails, that easily renewable fastenings be provided. | → | Readily accessible bolt fastenings provide for rail renewal.  |
| 5. Be easily installed by ordinary track workers.  | → | Eight ordinary track laborers, by actual test, have laid 1,000 feet of Dayton Resilient track in a single day.            |
| 6. Cost installed should be reasonable."   | → | Dayton Resilient Tie Track costs \$2,000 per mile less than wood ties in gravel ballast.                                  |

# DAYTON



# "Holds the Rails to Gage"

The second requirement that a "substitute tie" should meet, says the Way Committee, is this: "Hold the rail to gage."

With the Dayton Resilient Tie the rails are held securely to gage by bolts accurately located in steel cross members. There are no spikes to loosen under the side thrust of traffic. The sway of rolling stock, which ordinarily tends to pull the spikes and spread the rails, actually binds the rails tighter to Dayton Resilient Ties and holds the track to even gage.

Thus does the Dayton Resilient Tie meet the Way Committee's second requirement. And again it is seen that the Dayton is MORE than a "substitute tie." Obviously, wood ties cannot possibly hold rails to gage as securely as Dayton Resilient Ties do.

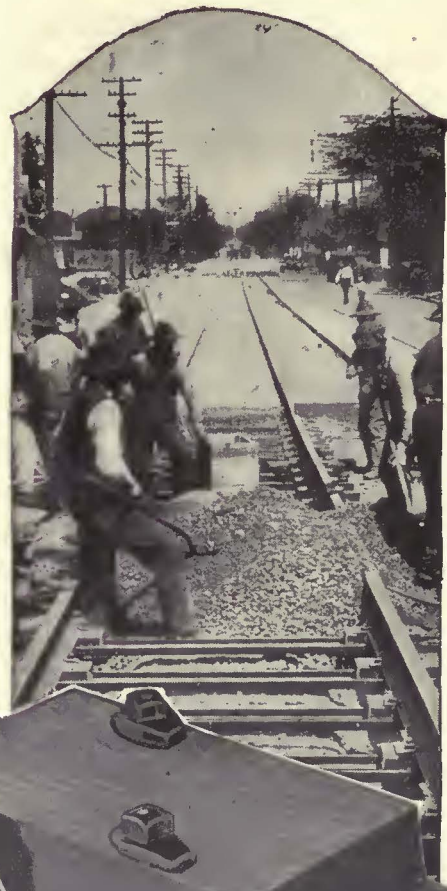
*In our next advertisement in this series we will tell you how the Dayton Resilient Tie "provides sufficient bearing area."*

## THE DAYTON MECHANICAL TIE CO.

707 Commercial Building, Dayton, Ohio

*Canadian Representative:*

Lyman Tube and Supply Co., Ltd., Montreal, Quebec



# Resilient TIE

Cushions the shock  
On Rolling Stock



# Carry On!

Buying power of Electric railways practically doubled during 1923.

\* \* \*

The extent of this recovery will be shown in the facts and figures in the Annual Statistical and Forecast Number, January 5.

\* \* \*

Where the industry is headed and what may be expected in the coming year plus vital facts not available through any other source are part of this important number.

\* \* \*

Every thinking electric railway executive knows and uses *Electric Railway Journal's* Annual Statistical Number. He studies it from cover to cover, and refers to it from week to week throughout the year.

\* \* \*

He knows from years of experience that he will find in this issue the facts he needs—facts in the text and facts in the ads.

\* \* \*

Because readers rely on the advertising section of the *Journal* as much as they do on the text pages, the Annual Statistical Number has become virtually a combined catalog for the leading manufacturers in the electric railway field.

*Get the benefit of an early start for another big year of railway business*

*Address your 1924 Sales Message to this live, prosperous buying industry.*

*Start with the big New Year issue.*

*Write or wire your reservation.*

## Electric Railway Journal

Tenth Avenue at 36th Street, New York





# Straight

You can be sure that every length of Bermico Fibre Conduit is made straight "as an arrow." (Bends and fittings too, in variety). Moreover the walls are automatically gauged to the one-thousandth of an inch. Utmost care in manufacture and inspection has produced a material that will stand up under the hardest service conditions.

# Straight

That describes the reputation of the manufacturer back of Bermico. Since 1852 the Brown Company has been known as a maker of quality pulp products.

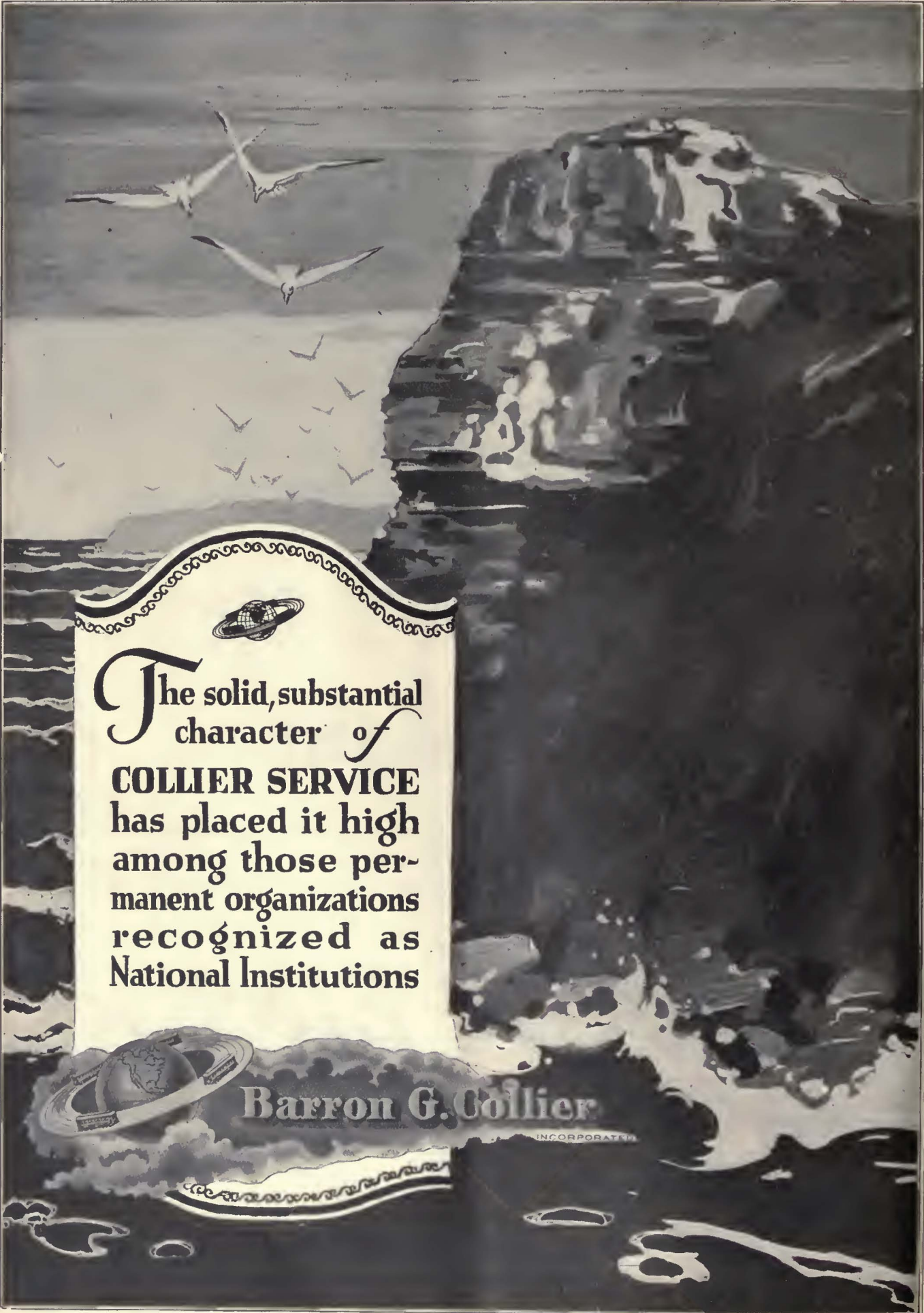
# Straight


Bermico comes straight to you through the Western Electric distributing organization. One of our 48 Houses is close enough to you to assure prompt deliveries.

# *Western Electric Company*

OFFICES IN 48 PRINCIPAL CITIES





  
**The solid, substantial  
character of  
COLLIER SERVICE  
has placed it high  
among those per-  
manent organizations  
recognized as  
National Institutions**

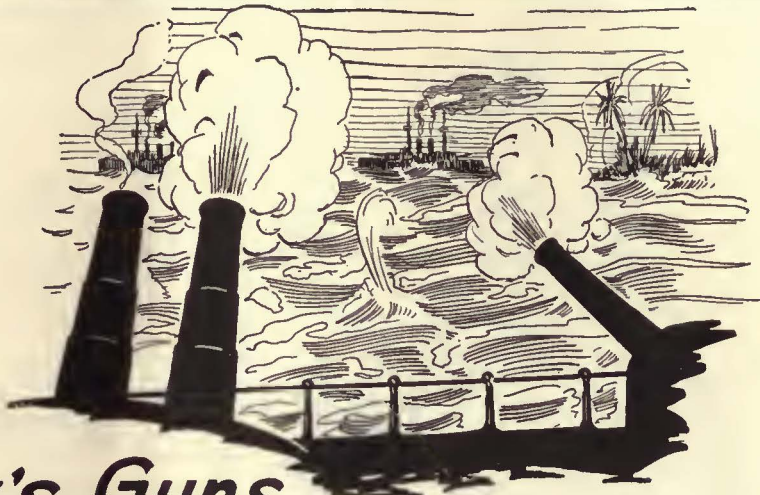
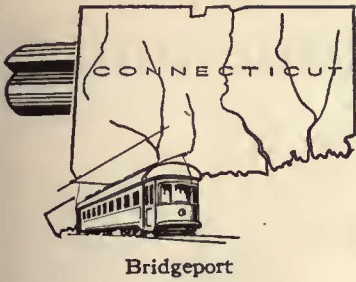


**Barron G. Collier**

INCORPORATED



A helpful service to the electric railway industry is located at Bridgeport.



# When Dewey's Guns thundered at Manila

STREET RAILWAY JOURNAL [Vol. XIV. No. 6.]

**"Phono-Electric" Wire**

FOR TROLLEY, TELEPHONE AND TELEGRAPH LINES

High Tensile Strength and Elastic Limit. Great Ductility. Will not stretch. Does not break at kinks, joints or scratches. Practically non-corrodible. This wire cannot be equalled where safe, durable and permanent construction is required.

**THE BRIDGEPORT BRASS CO.,**  
 ... BRIDGEPORT, CONN ... 85-87 PEARL STREET, Boston.  
 17 NORTH 7th STREET, Philadelphia, Pa.

19 MURRAY STREET, New York.

ESTABLISHED 1862

An Advertisement—reproduced from the June, 1898 Street Railway Journal

## Phono-Electric

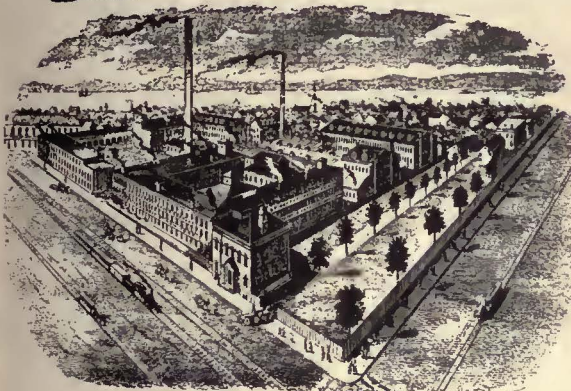
—a good wire then!

In Spanish War days, Phono-Electric was just in its infancy, in an industry which was itself quite young. Only ten years before that, the first practical trolley car installation had been made. But even in those early days progressive railway operators and electrical engineers were quick to grasp the economy-producing opportunity afforded by a trolley wire which would outlast the ordinary product three or four times.

—a better wire now!

A quarter of a century has passed. During that time experience with many installations has been translated into improvements in the manufacture of Phono-Electric. In other words a good product has been made better.

That old advertisement above, tells in the minimum number of words, the story of Phono-Electric's qualities. Those qualities are even more strongly emphasized in present-day Phono-Electric.



Our plant as it looked in 1898 when producing Phono-Electric as advertised

**Bridgeport Brass Company**  
 BRIDGEPORT - CONNECTICUT

**"Bridgeport" Phono-Electric**  
 TRADE CO. MARK  
 WE MAKE

- Ledrite Brass Rod
- Phono-Electric Contact Wire
- Plumrite Brass Pipe
- Phono-Hi-Strength Wire
- Tubular Plumbing Goods
- Condenser Tubes-Sugar Tubes
- Brass, Bronze and Copper Sheets
- Brass, Bronze and Copper Tubes
- Auto Bicycle and Pressure Pumps
- Auto Accessories-Stampings
- Engravers' Copper Specialties
- Screw Machine Products
- Pressed or Drawn Products
- Oil and Grease Guns

Electric Non-Ferrous

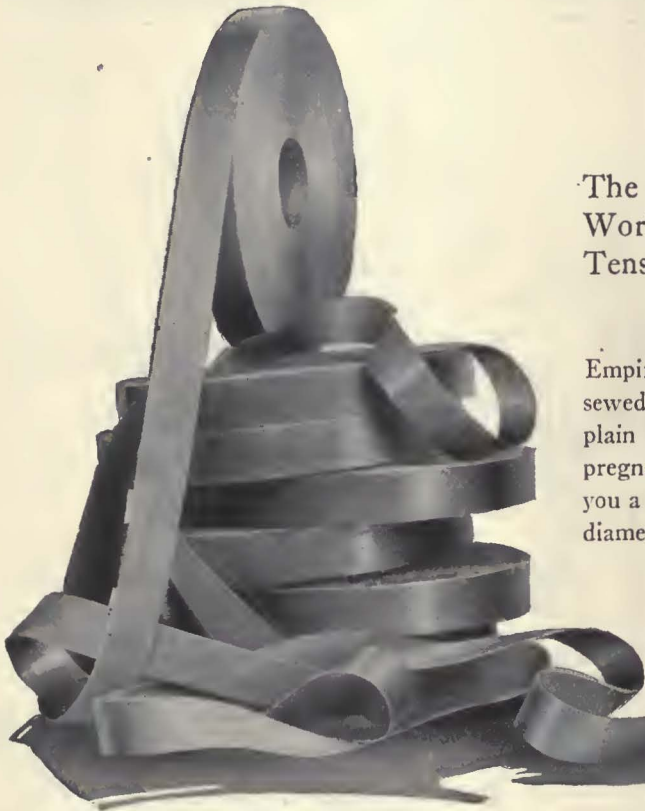
Furnace Alloys

Pershing Square Building.  
 North American Building.  
 Wrigley Building.  
 General Motors Building.

New York City  
 Philadelphia, Pa.  
 Chicago, Illinois  
 Detroit, Michigan



# This new tape will save you time and \$!



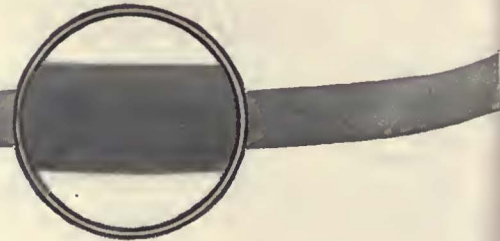
Seamless **EMPIRE** Bias

(BIAS CUT—SEAMLESS)

The better tape for: Armature Coils; Repair Work; Cable Splicing; Bus Protection; High Tension Work.

### Superior for Taping Machines

Empire Seamless Bias Tape is much superior to the old sewed seam tape for machine taping and it eliminates the plain woven tapes by doing away with the need for impregnation. It saves time, occupies less space, and gives you a neat, complete, finished job in one operation! Special diameter rolls for taping machines furnished.



Here is the new EMPIRE varnished cambric tape that is bias cut and seamless! It provides all the advantages of the regular impregnated bias tape, and in addition it is free from the limitations and drawbacks of the old-style stitched seam. It is absolutely the same thickness at all points because there are no seams. It ensures a smooth, uniformly protected insulating job, and every inch of it is usable and can be hand or machine applied. It also saves money by eliminating the time lost in cutting out the sewed seams that occur every 52 inches, and the considerable amount of tape that is wasted in cutting, and the short circuits that occur due to the failure of such seams as are left in and form weak spots that eventually break down. It saves you time and money both in application and in service and gives you a better job, either hand or machine applied.

Send for data and test pieces

Send to our nearest office for data and quotations on your insulation requirements, and for test samples and full information. Our Engineering Department is at your disposal for suggestions and recommendations.

## MICA INSULATOR COMPANY

68 Church Street, New York

542 So. Dearborn Street, Chicago

Victoriaville, Canada

### AGENTS:

G. A. MORRELL  
516 Caxton Bldg., Cleveland, Ohio

THE MONROE BRASS & WIRE CO.  
804 Traction Bldg., Cincinnati, Ohio

W. A. BITTNER CO.  
422 First Avenue, Pittsburgh, Pa.

W. E. SPITTLER  
38 Chardon Street, Boston, Mass.

THE ELECTRICAL SPECIALTY CO., Inc.  
75 Fremont Street, San Francisco, Cal.

THE ELECTRICAL SPECIALTY CO., Inc.  
411 South Main Street, Los Angeles, Cal.





# ALUMINUM RIGID CONDUIT

**SAVES WEIGHT** in car construction just as do aluminum stanchions, roofs, panels, seat frames, doors, etc. Aluminum weighs only about one-third as much as ordinary metals. If 300 lbs. of iron are replaced with aluminum, the weight saving is approximately 200 lbs.

**SAVES MONEY.** Aluminum conduit will not rust. It has high resistance to corrosion. The expense of replacement is reduced proportionately.

Each length bears the Underwriter's Laboratories label.

Write our nearest office for data on aluminum conduit, tubing for air lines, stanchions, panels, moulding, doors, seat parts, etc.

## Aluminum Company of America Pittsburgh, Pennsylvania

**OFFICES**

- |              |                   |
|--------------|-------------------|
| Albany       | New Haven         |
| Boston       | Newark            |
| Buffalo      | New York          |
| Chicago      | Philadelphia      |
| Cleveland    | Pittsburgh        |
| Dayton       | San Francisco     |
| Detroit      | St. Louis         |
| Indianapolis | Washington, D. C. |
| Kansas City  | Export Sales      |
| Minneapolis  | New York          |

Aluminum Company of America

Gentlemen:

I am interested in aluminum for.....

Please send  Representative,  
 Information,  
 Sample.

RJ .....

Please mail Coupon to nearest office.

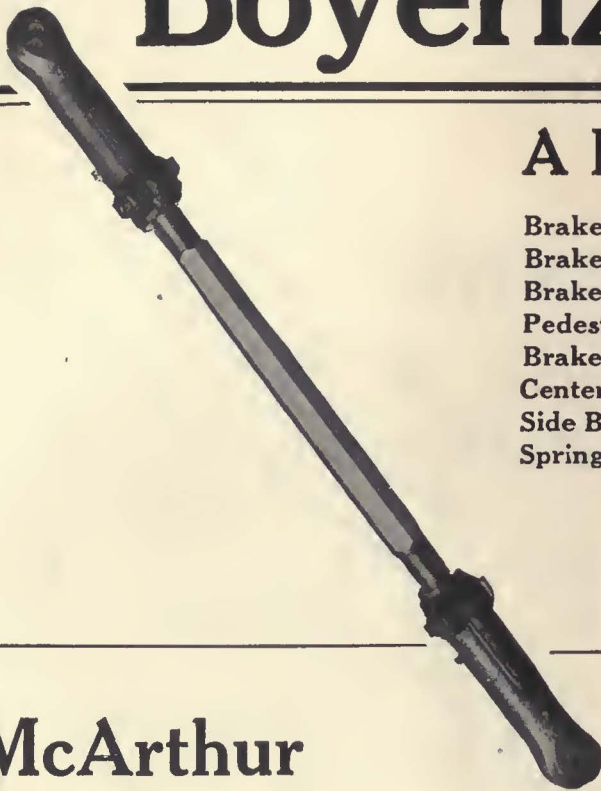


# Boyerized Parts!

## A List of Money Savers

Brake Pins  
 Brake Hangers  
 Brake Levers  
 Pedestal Gibs  
 Brake Fulcrums  
 Center Bearings  
 Side Bearings  
 Spring Post Bushings

Spring Posts  
 Bolster and Transom  
 Chafing Plates  
 McArthur Turnbuckles  
 Manganese Brake Heads  
 Manganese Truck Parts  
 Bushings  
 Bronze Bearings



### McArthur Turnbuckles



McArthur Turnbuckles are just one example of the Boyerized line. The illustration below is an enlarged view of the business end of the McArthur Turnbuckle.

Built to last—like all the Boyerized stuff!

But more than that—the old-style jam-nut idea has been scrapped, and an efficient spring-equipped split-clamp principle has been substituted. Now it only takes a pocket-wrench and a moment's time to make an adjustment, and tighten it up to stay.

*because—*

the Boyerizing process makes them last so much longer than the usual kind of equipment. Experience demonstrates it. Try them.



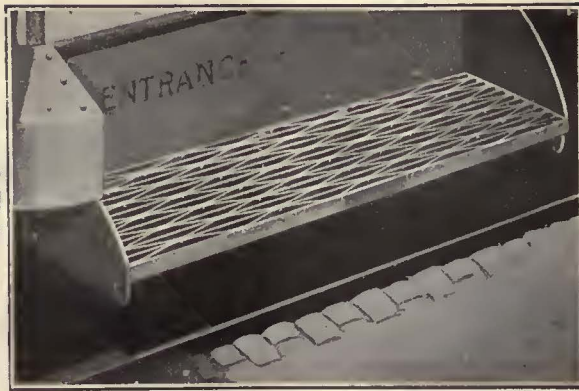
### Bemis Car Truck Company

*Electric Railway Supplies*  
 Springfield, Mass.

Representatives:

- Economy Electric Devices Co., Old Colony Bldg., Chicago, Ill.
- F. F. Bodler, 903 Monadnock Bldg., San Francisco, Cal.
- W. F. McKenney, 54 First Street, Portland, Ore.
- J. H. Denton, 1328 Broadway, New York City, N. Y.
- A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.





**IRVING SAFSTEP**  
TRADE MARK  
(PATENTED) REG. U.S. PAT. OFF.  
**ABSOLUTELY NON-SLIPPING ALWAYS**

Whatever the type or character of your car equipment, and whether for city or interurban traffic, **Irving Safsteps** will mean greater safety and comfort for your passengers, and lower step-accident hazard for you.

**Absolutely Non-Slipping**—under all conditions—wet or dry—even with snow or ice upon them.

**Extremely Light Weight**, with the utmost of strength and rigidity.

**Permanently Non-Slipping**—no abrasive insets, no bars or mats to wear out and work loose.

**Practically Indestructible**, because made of steel members solidly riveted up in a self-contained unit.

**Cleanly**, because dirt and dust fall through and are not tracked into the car.

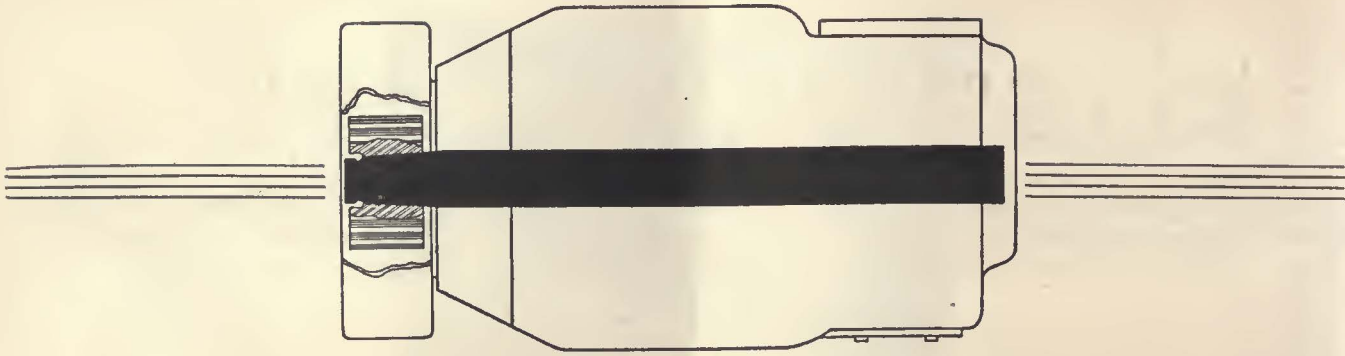
**Economical**, because time-proof and wear-proof, and adapted to any type or size of car.

Think of the dollars-and-cents value of these Safstep qualities, on your own lines. Then write for Catalog 4A28.

**IRVING IRON WORKS CO.**  
 LONG ISLAND CITY. N.Y.. U.S.A.







## ARMATURE SHAFTS

Armature shafts are subject to alternating stresses incessantly repeated.

If there is any point of weakness, a fracture starts and slowly progresses until the shaft is no longer able to stand up. There is no economy, therefore, in purchasing "cheap" forgings. A shaft made of open hearth hammered steel by Standard Steel Works Company may be purchased with assurance of real economy.

*"Not only to make better products but to make them better understood—  
not only to sell but to serve, assisting those who buy to choose as well  
as use their purchases—this is the privilege, if not the practice  
of all modern manufacturers."—Vauclain.*

# STANDARD STEEL WORKS COMPANY

PHILADELPHIA, PA.

BRANCH OFFICES

CHICAGO  
ST. LOUIS

HOUSTON, TEXAS  
PORTLAND, ORE.

RICHMOND, VA.  
SAN FRANCISCO  
NEW YORK

BOSTON  
ST. PAUL, MINN.

PITTSBURG, PA.  
MEXICO CITY, MEX.

WORKS: BURNHAM, PA.



# St. Louis Quality Cars



New City Cars for Indiana Service Corporation, Fort Wayne, Ind.

These new double-truck, one-man, front-entrance, end exit cars are arranged with double selective-type doors at front to expedite loading; the exit is the rear door controlled from the motorman's position; there is a motorman's signal light in each vestibule connected with the rear exit-door.

These cars are 39 ft. 11 in. long over all with 2 ft. 4½ in. post spacing and seating capacity of 44 passengers. Trucks are St. Louis AM 64 diamond arch, bar type equipped with quadruple 25 H.P. motors.

**St. Louis Car Company**  
St. Louis, Mo.

*"The Birthplace of the Safety Car"*

Further particulars  
sent upon request.

# Nuttall

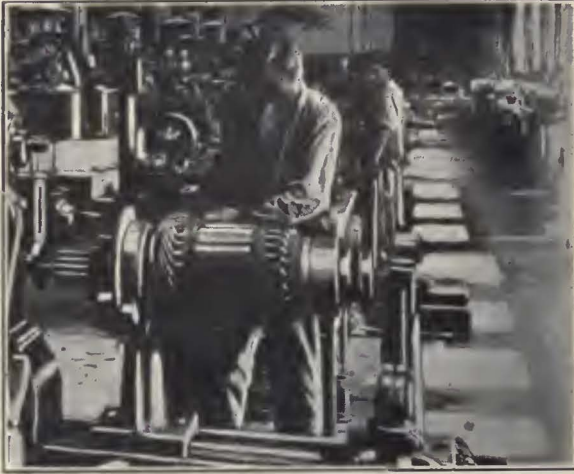
Watch for an early announce-  
ment of the new Nuttall Timken  
Roller Bearing Trolley Base.

**R.D. NUTTALL COMPANY**  
PITTSBURGH  PENNSYLVANIA



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





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It's a simple thing to lay down a piece of combination slot insulation (cut to specification) and insert the coil or coils. Irvington slot insulation is made up of a layer of varnished cambric and a layer of fibrous paper solidly cemented together with a flexible insulating compound that will not dry out.

And the Seamless Bias tape is a big time- and labor- and material-saver as compared with the old type of sewed bias.

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Sign that requisition now.*

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Varnished Silk  
Varnished Paper  
Black and Yellow Varnished Cambric  
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Tapes  
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Special Folded Paper for Coil  
Windings

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Special Adhesive  
High Dielectric Paper  
Insulating Varnishes and  
Compounds  
"Irv-O-Slot" Insulation

**IRVINGTON VARNISH & INSULATOR CO.**  
Irvington, New Jersey.

Established 1905

Sales Representatives:

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T. C. White Electrical Supply Co., St. Louis  
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"Tool Steel"  
**HELICALS**  
are just as superior  
in quality as  
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STUBS.  
Tool Steel Quality  
The Tool Steel  
Gear and Pinion Co.  
CINCINNATI, O.

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Diamond "S" Steel Back is the Best Type



Standard  
Patterns  
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### SAFETY CAR



D-67 for Narrow Treads  
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SOLDERLESS



# Dossert Angle Lugs

When we say SOLDERLESS we mean by that the Dossert *Tapered Sleeve* principle of solderless connection.

The 15th Year Book illustrates and describes the various units that make up the line together with full data on use.

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## CREOSOTERS

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Cross Ties                      Bridge Timbers  
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*Treated and Untreated*

*We solicit your inquiries*

Creosoting Plant located  
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On—Penna. R.R., B. & O. R.R., D. T. & I. R.R.  
Operating Mills in Southern Ohio

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Pittsburgh, Pa.



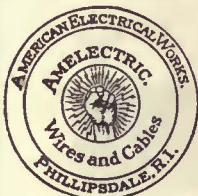
Manufacturers of  
Copper, Brass, Bronze Wires, Rods, Tubes  
Copper Clad Steel Wire  
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Lead Covered and Armored Cables  
Cable Terminals, Junction Boxes, etc.

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Third Ball Insulators, Trolley Bases, Harps and Wheels, Bronze and Malleable Iron Frogs, Crossings, Section Insulators, Section Switches

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Established 1877  
Branches—New York, 135 B'way  
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Standard in the Electric Industries  
for 35 years

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Trade Mark

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Adapted to all types of rails and paving.



Proven by service to economically prevent seepage and disintegration of street railway paving.  
Write for illustrated Catalog No. 20.  
Race & McComas Sts., Baltimore, Md.

W. S. GODWIN CO., Inc.



INSULATED WIRES AND CABLES

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*Send for new  
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Special Track Equipment and Layouts  
of all kinds

**THE BUDA COMPANY**  
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205 Broadway, Cambridgeport, Mass.  
Established 1858

Manufacturers of  
**Special Work for Street Railways**  
Frogs, Crossings, Switches and Mates  
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THE WIRE LOCK / THE CHAMFERED JOINT

COMBINE

**Lowest Cost**                      **Lightest Weight**  
**Least Maintenance**        **Greatest Adaptability**

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**ELECTRIC RAILWAY EQUIPMENT CO.**  
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Great Adhesive  
Strength  
High Quality  
Long Life  
Price Right



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Incorporated 1884

Sales Offices: New York—Atlanta—San Francisco  
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Automatic Signals**

Charles N. Wood Co., Boston



**U. S. ELECTRIC  
AUTOMATIC SIGNAL**

for single track block signal protection  
**United States Electric Signal Co.**  
West Newton, Mass.

**ANACONDA  
TROLLEY WIRE**

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Drop Forged to  
insure reliability  
and strength.



Type B, Eye and Hook

Double Hot  
Galvanized to  
preserve that  
strength.

**HUBBARD & COMPANY**  
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## Lorain Special Trackwork Girder Rails

*Electrically Welded Joints*

**THE LORAIN STEEL COMPANY**

Johnstown, Pa.

Sales Offices:

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*Pacific Coast Representative:*  
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Los Angeles Portland San Francisco Seattle  
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## High-Grade Track Work

SWITCHES—MATES—FROGS—CROSSINGS  
COMPLETE LAYOUTS  
IMPROVED ANTI-KICK BIG-HEEL SWITCHES  
HARD CENTER AND MANGANESE  
CONSTRUCTION

New York Switch & Crossing Co.  
Hoboken, N. J.

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in the

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of

**Standard—Insulated—and  
Compromise Rail Joints**

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**Special Trackwork**  
*For Street and Steam Railways*

Steel Castings Gas Cylinders

ORIGINATORS OF  
**Manganese Steel Trackwork**

**WM. WHARTON JR. & CO., Inc.**

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## Metal Safety Railway Tie Co.

522 North American Bldg., Philadelphia, Pa.

**All-metal cross ties**

Types for open and closed tracks  
*"More flexible than wood"*

See advertisement, issue, Sept. 29, page 88.  
Ask for circular on either type. Prices upon application.

## AUTOMATIC SIGNALS

Highway Crossing Bells  
Headway Recorders

**NACHOD SIGNAL COMPANY, INC.**  
LOUISVILLE, KENTUCKY.



## Series Type

**Arc Welding and Bonding  
Outfit**

Rugged series resistance coil  
Indestructible Mica insulation  
Normal welding current at half voltage

**The Electric Railway Improvement Co.**  
Cleveland, Ohio

## ERICO RAIL BONDS

## A Single Segment or a Complete Commutator

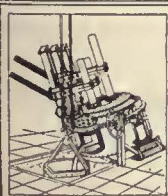
is turned out with equal care in our shops. The orders we all differ only in magnitude; small orders command our utmost care and skill just as do large orders. CAMERON quality applies to every coil or segment that we can make, as well as to every commutator we build. That's why so many electric railway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

**Cameron Electrical Mfg. Co., Ansonia, Connecticut**

## BUCKEYE JACKS

High-grade R. R. Track and Car Jacks

**The Buckeye Jack Mfg. Co.**  
Alliance, Ohio



**Moore Rapid  
Section Melt  
Furnaces**

Ten Standard Sizes 1/2 to 24 Tons Capacity  
Most Rapid and efficient for making  
Tool Steels, Alloy Steels, Forging Steels  
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Ramapo Automatic  
Return Switch  
Stands  
for Passing  
Sidings



**RACOR** Tee Rail  
Special Work.  
Manganese  
Construction

GENERAL OFFICES: HILLBURN, NEW YORK  
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## Tribloc Chain Hoists



These hoists have 80 per cent efficiency. For example, an eighty-two pound pull on the chain of a 1-ton Tribloc will lift a ton. Made in capacities from  $\frac{1}{4}$  to 20 tons.

Write for Catalog 5-B

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Overseas Representative: Allied Machinery Co. of America  
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### The Differential Car

An automatic dump car, an electric locomotive, a snow plow, and a freight car—all in one. Big savings shown in track construction and maintenance, paving work, coal hauling, ash disposal, snow removal, and freight transportation.

The Differential  
Steel Car Co.  
Findlay, Ohio



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85 LIBERTY STREET, NEW YORK

Builders since 1868 of  
Water Tube Boilers  
of continuing reliability

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CHICAGO, Marquette Building  
CINCINNATI, Traction Building  
ATLANTA, Candler Building  
TUCSON, ARIZ., 21 So. Stone Avenue  
DALLAS, TEX., 2001 Magnolia Building  
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Bayonne, N. J.  
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Makers of Steam Superheaters  
since 1898 and of Chain Grate  
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SAN FRANCISCO, Sheldon Building  
LOS ANGELES, 404-6 Central Building  
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SAN JUAN, PORTO RICO, Royal Bank Building

# FOSTER SUPERHEATERS

A necessity for turbine protection, engine cylinder economy and utilization of superheat for all its benefits

POWER SPECIALTY COMPANY, 111 BROADWAY, NEW YORK

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MILWAUKEE, WIS. U. S. A.

Electrical Machinery, Steam Turbines, Steam Engines,  
Condensers, Gas and Oil Engines, Air Compressors,  
Air Brakes

# RAILWAY UTILITY COMPANY

Sole Manufacturers

"HONEYCOMB" AND "ROUND JET" VENTILATORS  
for Monitor and Arch Roof Cars, and all classes of buildings;  
also ELECTRIC THERMOMETER CONTROL  
of Car Temperatures.

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Write for  
Catalogue

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E.R.J.

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**ROADMASTER** wanted for electric road in the East. Must be thoroughly efficient in the handling of material and labor and competent in the maintenance of city and interurban track. State experience, salary expected and when available. P-622, Elec. Ry. Journal, 10th Ave. at 36th St., New York.

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**SUPERINTENDENT** of transportation, at present with a large successful property that has been placed on a sound basis largely through efforts of advertiser, solicits correspondence or interviews with managers of city and suburban properties that require effort and ability to get results. A wide practical experience places me in a position to build up an efficient organization that would be a credit to any property. Also recognized as an economical operator, quick to locate leaks and correct same. High grade references from present employers as to character and ability to get results regardless of size or condition of property. Personal reasons for desiring a change. PW-604, Elec. Ry. Journal, Real Estate Trust Bldg., Phila., Pa.

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**ENGINEER** of equipment, technical graduate, with several years' experience. PW-623, Elec. Ry. Journal, Old Colony Bldg., Chicago, Ill.

## Three Electric Cars

New cars still in the shop, modern in every way, 45 passengers, standard gauge, designed for interurban service in Cuba, each equipped with two G. E. 50 hp. motors for D.C. 1200 v. Acquired by judgment. We will sell cheap.

The Davison Chemical Company  
 Garrett Building, Baltimore

FOR SALE

## RAILWAY MOTORS

2—Unused General Electric, type 210-H, 50% of market price.

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 926 N. Third St., Philadelphia, Pa.

FOR SALE

- 50—G. E. No. 80-A Motors.
- 50—Controllers, K-28-B; K-12.
- 35—B-2 Compressors.

ELECTRIC EQUIPMENT CO.  
 Commonwealth Bldg., Philadelphia, Pa.

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Cars, Locomotives, Tanks, Steel Piling  
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## ZELNICKER IN ST. LOUIS

400 Tons 65 lb. rails

FOR SALE

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1—Second-hand Sterling Water Tube, 260 hp., in good condition.

Apply,  
 NEW YORK STATE RAILWAYS  
 Purchasing Dept.  
 Rochester, N. Y.

FOR SALE

## MOTORS

28 WHs 101-B-2 Motors  
 10WHs 101-D Motors

TRANSIT EQUIPMENT COMPANY  
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**SHOCKS**  
*have little effect on*  
**AJAX CHECK PLATES**  
*because*  
 these plates are made from  
 Ajax Perfecto Bronze

*The strongest and toughest metal on the market. They will bend before they will break and give longest possible service.*

The Ajax Metal Company

Established 1880  
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NEW YORK CHICAGO BOSTON CLEVELAND



**VELOX**  
 WHY NOT TRY  
 A GILBERT & SONS B.F. CO.  
 ST. LOUIS, MO.  
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**BRONZE**

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A. STUCKI CO.  
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## SAMSON SPOT WATERPROOFED TROLLEY CORD



Trade Mark Reg. U. S. Pat. Off.  
 Made of extra quality stock firmly braided and smoothly finished. Carefully inspected and guaranteed free from flaws. Samples and information gladly sent.

SAMSON CORDAGE WORKS, BOSTON, MASS.



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Equipment, Apparatus and Supplies Used by the Electric Railway Industry with  
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- Air Receivers & Aftercoolers**  
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- Anchors, Guy**  
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Ohio Brass Co.  
Western Electric Co.  
Westinghouse E. & M. Co.
- Armature Shop Tools**  
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- Automatic Return Switch Stands**  
Ramapo Ajax Corp.
- Automatic Safety Switch Stands**  
Ramapo Ajax Corp.
- Axles**  
Bemis Car Truck Co.  
St. Louis Car Co.  
Standard Steel Works Co.
- Axles, Car Wheel**  
Bemis Car Truck Co.  
Brill Co., The J. G.  
Carnegie Steel Co.  
Westinghouse E. & M. Co.
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Ajax Metal Co.
- Badges and Buttons**  
Elec. Service Supplies Co.  
International Register Co., The
- Bearings and Bearing Metals**  
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General Electric Co.  
Gilbert & Sons B. F. Co., A.  
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Railway Track-work Co.  
Rail Welding & Bonding Co.  
Western Electric Co.
- Bonds, Rail**  
Amer. Steel & Wire Co.  
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Ohio Brass Co.  
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(See also Poles, Ties, Posts, Etc.)
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Bemis Car Truck Co.  
Brill Co., The J. G.  
St. Louis Car Co.
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Jeandron, W. J.  
Le Carbone Co.  
Stackpole Carbon Co.  
Westinghouse E. & M. Co.
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Anderson Mfg. Co., A. & J. M.
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St. Louis Car Co.
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Brill Co., The J. G.  
St. Louis Car Co.
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Electric Equipment Co.  
Transit Equipment Co.
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Car Signal System  
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Castings, Gray Iron and Steel  
Bemis Car Truck Co.  
St. Louis Car Co.  
Standard Steel Works Co.
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Ohio Brass Co.
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St. Louis Car Co.
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- Condensers**  
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Dossert & Co.  
Westinghouse E. & M. Co.
- Connectors, Trailer Car**  
Consolidated Car Heat. Co.  
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Ohio Brass Co.
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Westinghouse E. & M. Co.
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Elec. Service Supplies Co.
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General Electric Co.  
Westinghouse E. & M. Co.
- Converters, Rotary**  
Allis-Chalmers Mfg. Co.  
General Electric Co.  
Westinghouse E. & M. Co.
- Copper Wire**  
Anaconda Copper Mining Co.  
Cord, Bell, Trolley, Register  
Brill Co., The J. G.  
Elec. Service Supplies Co.  
Internat'l Register Co., The  
Roebbling's Sons Co., John A.  
St. Louis Car Co.  
Samson Cordage Works  
Silver Lake Co.
- Cord Connectors and Couplers**  
Elec. Service Supplies Co.  
Samson Cordage Works  
Wood Co., Chas. N.
- Couplers, Car**  
Brill Co., The J. G.  
Ohio Brass Co.  
St. Louis Car Co.  
Westinghouse Tr. Br. Co.
- Cranes**  
Allis-Chalmers Mfg. Co.  
Crane Arms (See Brackets)
- Crossing Foundations**  
International Steel Ties Co.
- Crossing, Frog & Switch**  
Ramapo Ajax Corp.  
Wharton, Jr., & Co., Wm.
- Crossing, Manganese**  
Ramapo Ajax Corp.
- Crossings**  
Ramapo Ajax Corp.
- Crossings, Track** (See Track, Special Work)
- Crossings, Trolley**  
Ohio Brass Co.
- Curtain and Curtain Fixtures**  
Brill Co., The J. G.  
Elec. Service Supplies Co.  
Morton Mfg. Co.  
St. Louis Car Co.
- Dealer's Machinery**  
Elec. Equipment Co.  
Toledo & Indiana R.R. Co.  
Transit Equip. Co.  
Zelnicke Supply Co., Walter A.
- Derailing Devices** (See also Track Work)
- Derailing Switches**  
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- Destination Signs**  
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- Detective Service**  
Wish-Service, P. Edward
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General Electric Co.  
Hale & Kilburn Co.  
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- Drills, Track**  
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Ingersoll-Rand Co.  
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Elec. Service Supplies Co.
- Ears**  
Ohio Brass Co.
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Amer. Steel & Wire Co.  
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Bibbins, J. Rowland  
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Ford, Bacon & Davis  
Hemphill & Wells  
Holst, Engelhardt W.  
Jackson, Walter  
Kelly Cooke & Co.  
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Parsons, Klapp, Brinkerhoff & Douglas  
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- Frogs, Trolley**  
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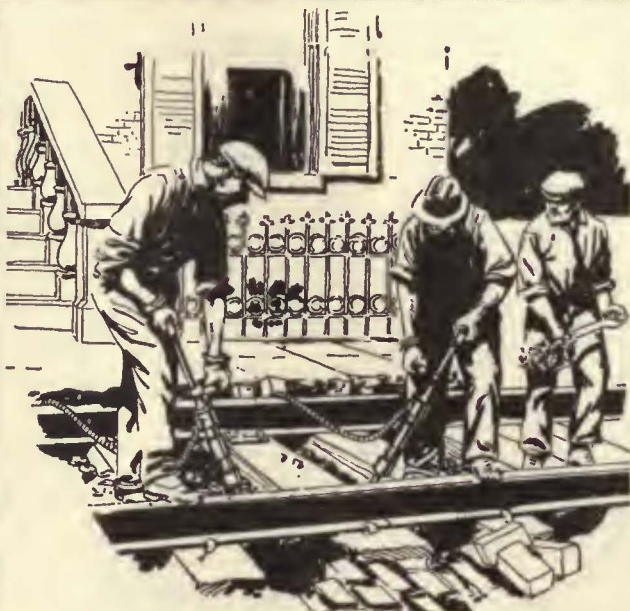
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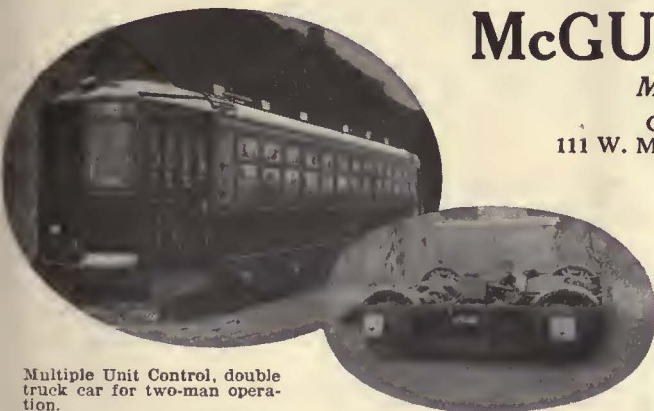
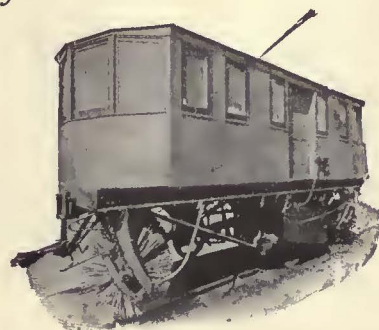
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- Switches, Tee Rail**  
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- Switches, Track (See Track Special Work)**
- Switches and Switchboards**  
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- Tee Rail Special Track Work**  
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International Steel Tie Co.
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- Tool Steel**  
Carnegie Steel Co.
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Railway Track-work Co.
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- Towers and Transmission Structures**  
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Wharton, Jr., & Co., Inc., W.
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- Transfer Tables**  
American Bridge Co.
- Transformers**  
Allis-Chalmers Mfg. Co.  
General Electric Co.  
Western Electric Co.  
Westinghouse E. & M. Co.
- Treads, Safety, Stair, Car Step**  
Morton Mfg. Co.
- Trolley Bases**  
Elec. Service Supplies Co.  
General Electric Co.  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Bases, Retrieving**  
Elec. Service Supplies Co.  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Buses**  
Brill Co., The J. G.  
General Electric Co.  
Westinghouse E. & M. Co.
- Trolley Material, Overhead**  
Ohio Brass Co.  
Elec. Service Supplies Co.
- Trolley, Shoe**  
Miller Trolley Shoe Co.
- Trolleys and Trolley Systems**  
Ford Chain Block Co.
- Trolley Wheels and Harps**  
Thornton Trolley Wheel Co.
- Trolley Wheels (See Wheels, Trolley)**
- Trolley Wire**  
Amer. Electrical Works  
Amer. Steel & Wire Co.  
Anaconda Copper Mln. Co.  
Bridgeport Brass Co.  
Roebling's Sons Co., J. A.  
Western Electric Co.
- Trucks, Car**  
Baldwin Locomotive Works  
Bemis Car Truck Co.  
Brill Co., The J. G.  
McGuire-Cummings Mfg. Co.  
St. Louis Car Co.
- Tube, Yellow & Black**  
Flexible Varnish  
Irvington Varnish & Ins. Co.
- Turbines, Steam**  
Allis-Chalmers Mfg. Co.  
General Electric Co.  
Westinghouse E. & M. Co.
- Turbines, Water**  
Allis-Chalmers Mfg. Co.
- Turnstiles**  
Elec. Service Supplies Co.  
Percy Mfg. Co., Inc.
- Valves**  
Ohio Brass Co.  
Westinghouse Tr. Br. Co.
- Varnished Papers**  
Irvington Varnish & Ins. Co.
- Varnished Silk**  
Irvington Varnish & Ins. Co.
- Ventilators, Car**  
Brill Co., The J. G.  
Nat'l Ry. Appliance Co.  
Nichols-Lintern Co.  
Railway Utility Co.  
St. Louis Car Co.
- Welded Rail Joints**  
Elec. Ry. Improvement Co.  
Ohio Brass Co.  
Railway Track-work Co.  
Rail Welding & Bonding Co.
- Welders, Portable Electric**  
Elec. Ry. Improvement Co.  
Ohio Brass Co.  
Railway Track-work Co.  
Rail Welding & Bonding Co.
- Welding Processes and Apparatus**  
Elec. Ry. Improvement Co.  
General Electric Co.  
International Oxygen Co.  
Ohio Brass Co.  
Railway Track-work Co.  
Rail Welding & Bonding Co.  
Westinghouse E. & M. Co.
- Welding Steel**  
Elec. Ry. Improvement Co.  
Railway Track-work Co.
- Wheel Guards (See Fenders and Wheel Guards)**
- Wheel Presses (See Machine Tools)**
- Wheels, Car, Cast Iron**  
Bemis Car Truck Co.  
Carnegie Steel Co.
- Wheels, Car Steel & Steel Tire**  
Carnegie Steel Co.  
Standard Steel Works Co.
- Wheels, Trolley**  
Elec. Ry. Equipment Co.  
Elec. Service Supplies Co.  
General Electric Co.  
Nuttall Co., R. D.
- Whistles, Air**  
General Electric Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.
- Wire Rope**  
Roebling's Sons Co., J. A.
- Wires and Cables**  
Aluminum Co. of America  
Amer. Electrical Works  
Amer. Steel & Wire Co.  
Anaconda Copper Mln. Co.  
Bridgeport Brass Co.  
General Electric Co.  
Kerite Insulated Wire & Cable Co.  
Okonite Co.  
Page Steel & Wire Co.  
Roebling's Sons Co., J. A.  
Std. Underground Cable Co.  
Western Electric Co.  
Westinghouse E. & M. Co.
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Baker Wood Preservative Co.
- Woodworking Machines**  
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Type R-10

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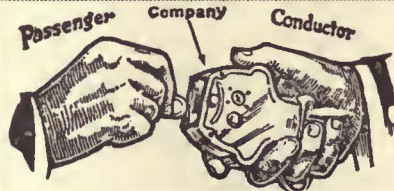
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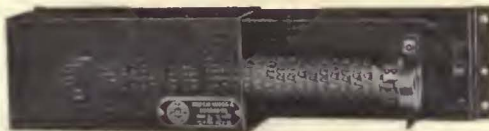


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At terminal points passengers enter by way of the rear platform and unload at the front, while at other points on the line passengers both enter and leave by way of the front platform.

*Complete details of construction will be furnished upon request to—*



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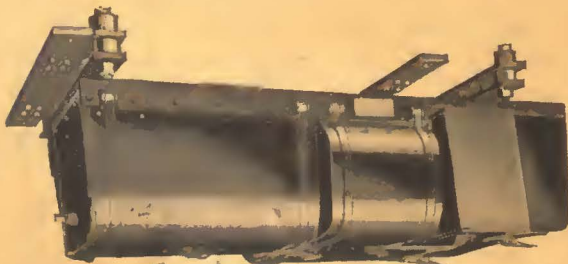
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