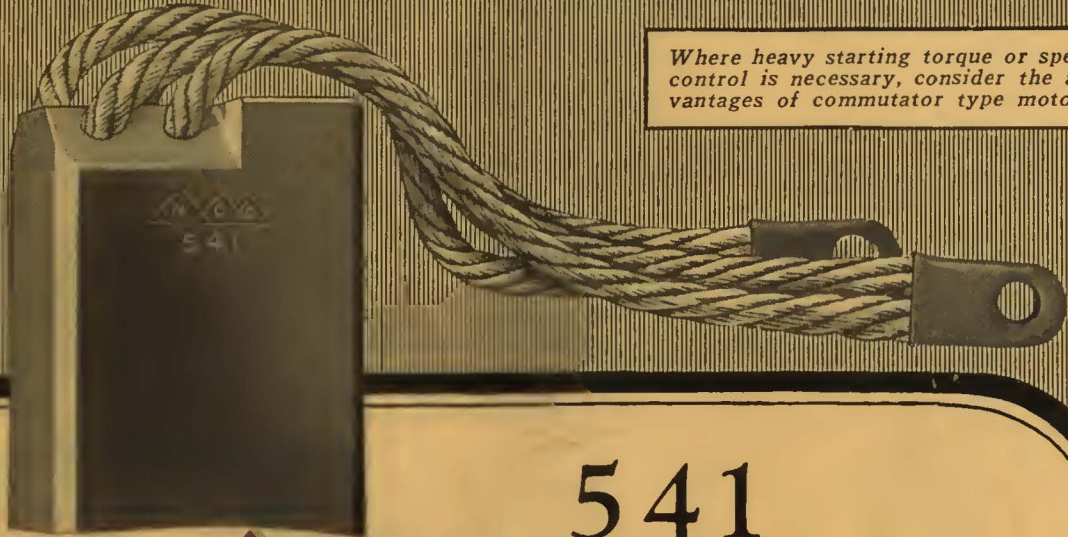


# ELECTRIC RAILWAY JOURNAL



Where heavy starting torque or speed control is necessary, consider the advantages of commutator type motors.

## 541

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# ELECTRIC RAILWAY JOURNAL

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Vol. 67  
No. 5

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## An Unusual Meeting

ON THURSDAY and Friday of this week the Central Electric Railway Association held its mid-winter meeting at Indianapolis.

Papers by Managing Director Storrs, President Coates, Past-President Budd, Messrs. Wickwire, Gordon, DeLamar, Kenney, Pinkley, Blinn, Graham, Smith, Nicholl, Norris and others were delivered before a large and enthusiastic audience.

A particularly optimistic viewpoint was presented. The program included able discussions on many subjects of vital interest to the industry. The quality of the papers was so high that the JOURNAL will run next week an unusually full report of the meeting.

There is ample evidence that an era of prosperity for the industry is rapidly opening up. Every railway man may receive much inspiration from a careful reading of this report.

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SAVING THE RAIL SAVES THE RAILWAY

---

# Rejuvenation

The "Journal" says that "Rejuvenation" is a word that is being bandied about a good deal in electric railway circles these days.

We are glad to hear it. As applied to track-work, we've preached it for years. And in no other department are results more gratifying.

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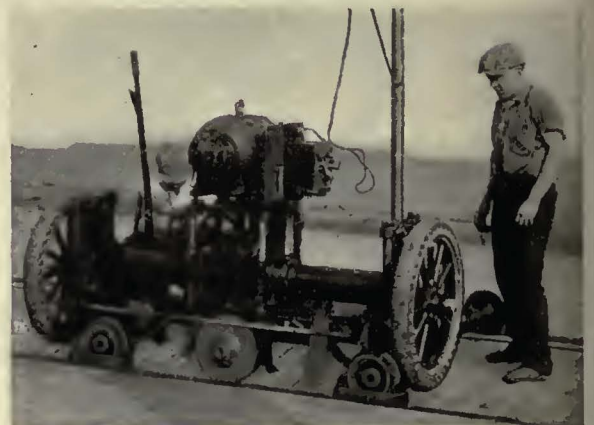
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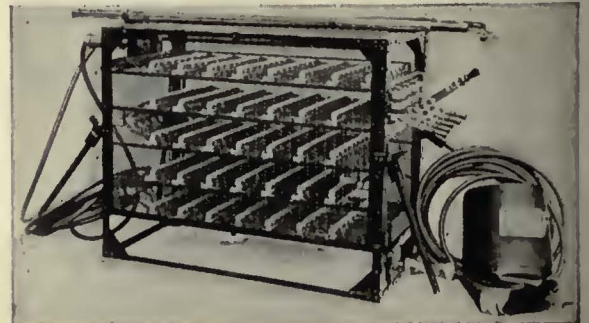
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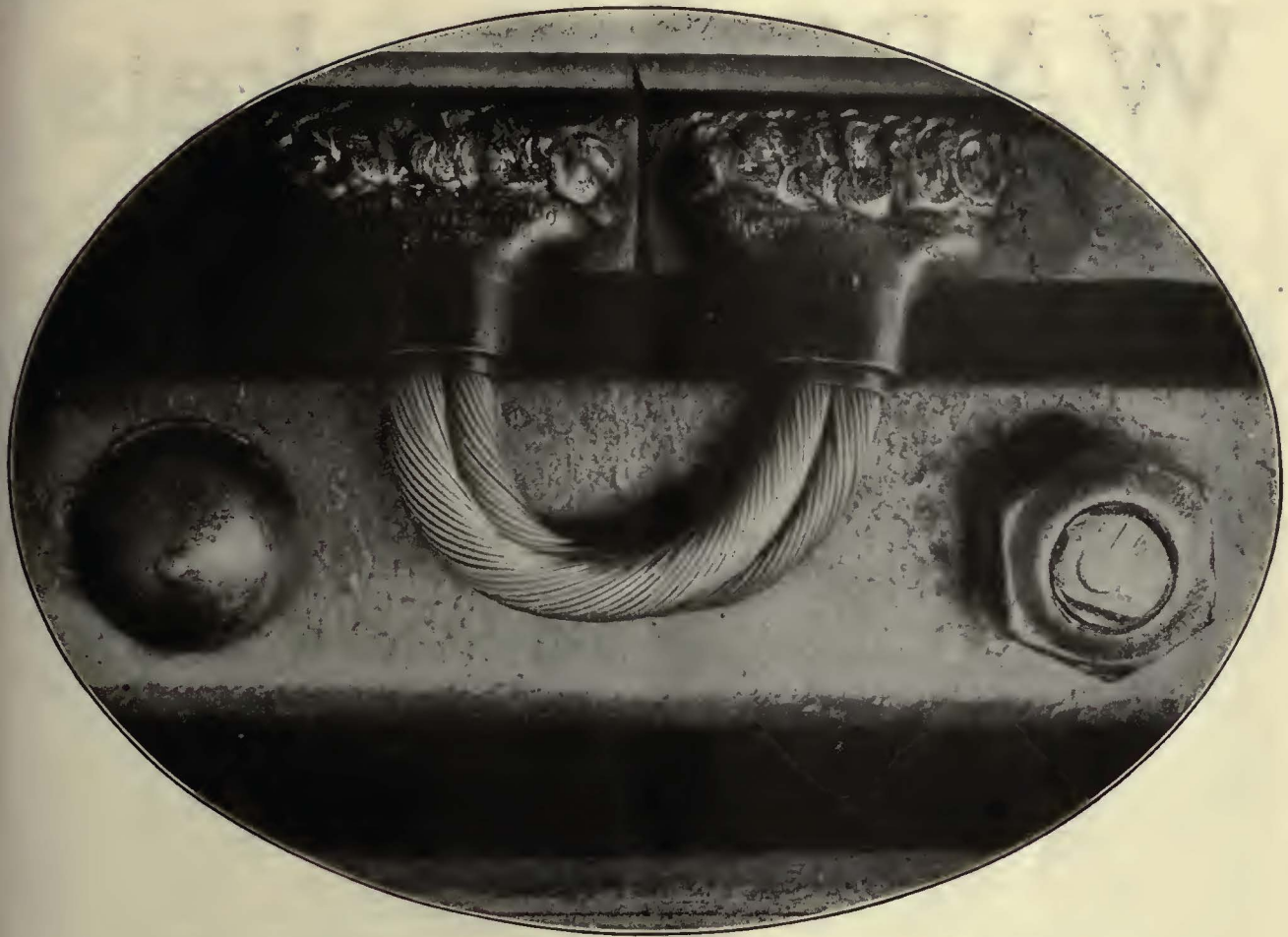


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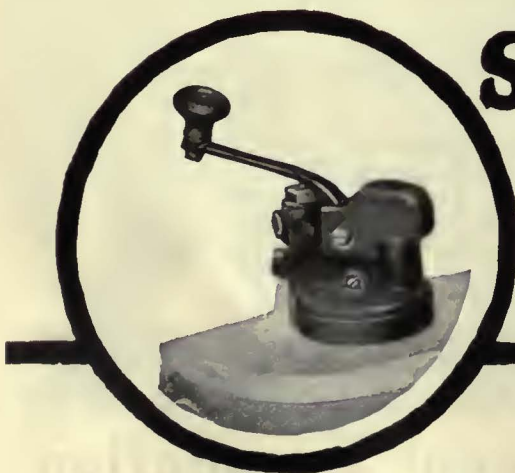


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Under View of Bottom Half



Inner View of Top Half

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# KEYSTONE Steel Gear Cases

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for roofing, headlining,  
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*Pantasote Products  
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vailed after all!*  
*Specify them for your buses  
also!*

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These cities find that it pays well, in savings and in goodwill, to specify, and always insist upon, only genuine Pantasote Products.

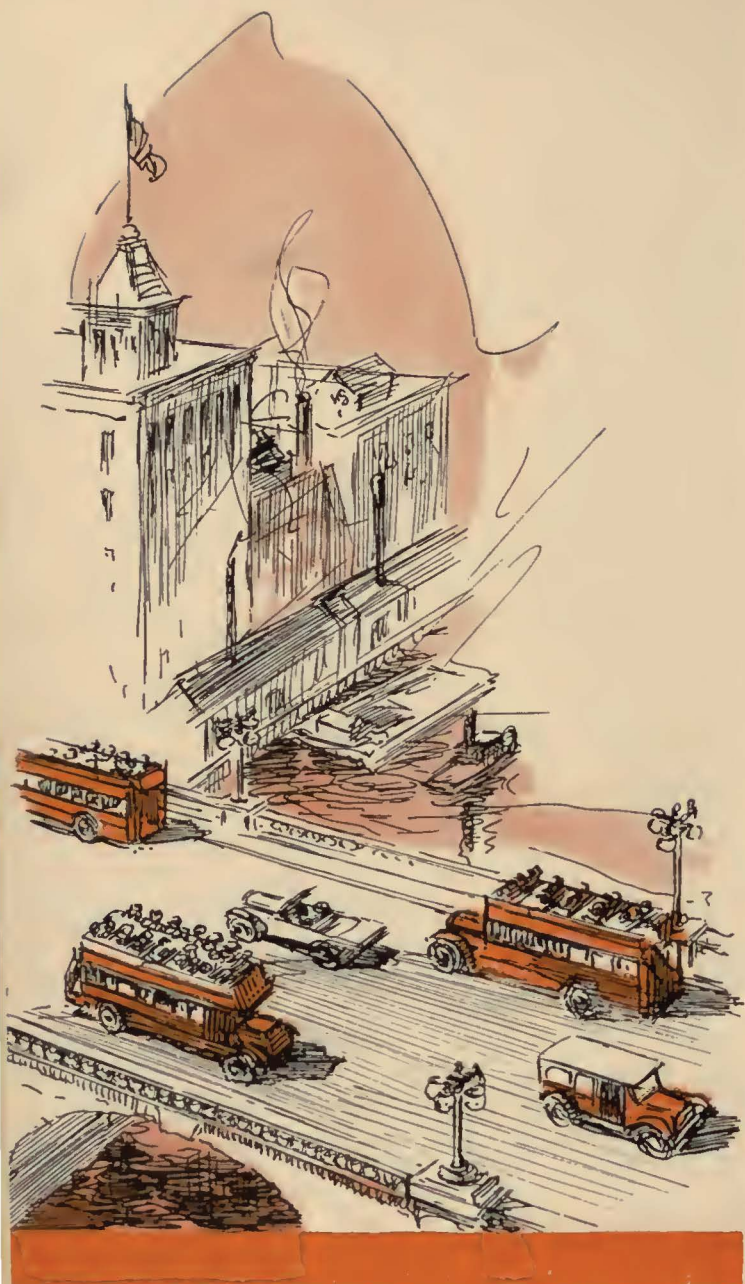
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**When  
Yellow Coach  
recommends**





**We recommend  
the tools we use  
in our own  
*business***



**P**ICTURE a highway  $2\frac{1}{2}$  million miles long.

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And now picture 150,000,000 passengers every year standing along this highway and paying their fares to ride.

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**YELLOW**

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2. With profit to the operating company.

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Write for Yellow Coach literature, it contains a fund of valuable information.



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Consider a few of these men.

*Vice-President*, GEO. A. GREEN, Vice-President, Chicago Motor Coach Company; Vice-President, Yellow Sleeve Valve Engine Works, Inc.; Formerly Vice-President and General Manager, Fifth Avenue Coach Company, New York City; Formerly Deputy Chief Mechanical Engineer, British Tank Corps; Formerly Works Manager and Chief Assistant Engineer of the London General Omnibus Company.

*Works Manager*, CHAS. O. BALL, Formerly Chief Engineer, American Motorbus Corporation; Formerly Engineer, London General Omnibus Company.

*Chief Engineer*, C. I. RACKHAM, Formerly Assistant Superintendent, British War Office, Department of Tanks, Design and Experiment; Formerly Engineer in Charge Experimental Department, London General Omnibus Company.

*Assistant Chief Engineer*, C. I. BOCK, Formerly Engineer, United States Ordnance Department, Washington, D. C.; Formerly Experimental Engineer, Holt Manufacturing Company, Peoria, Illinois.

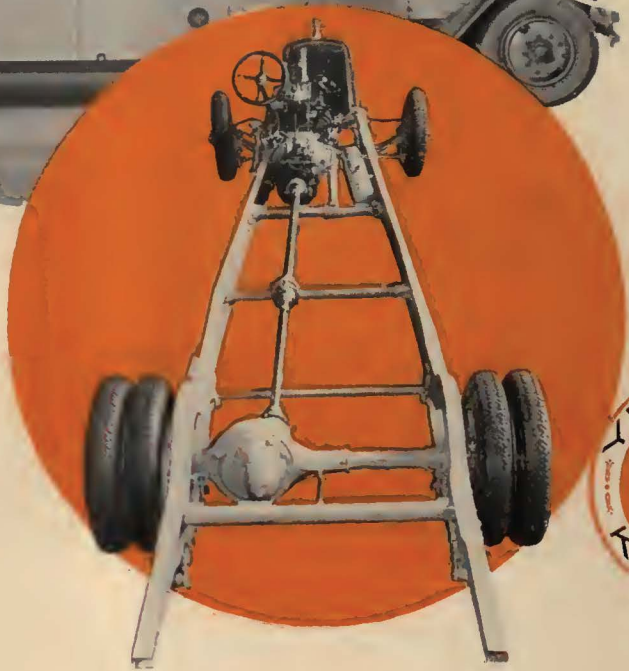


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for experience* —



Type Y Parlor Coach  
25-30 Passenger



Model Y Chassis—  
View from rear



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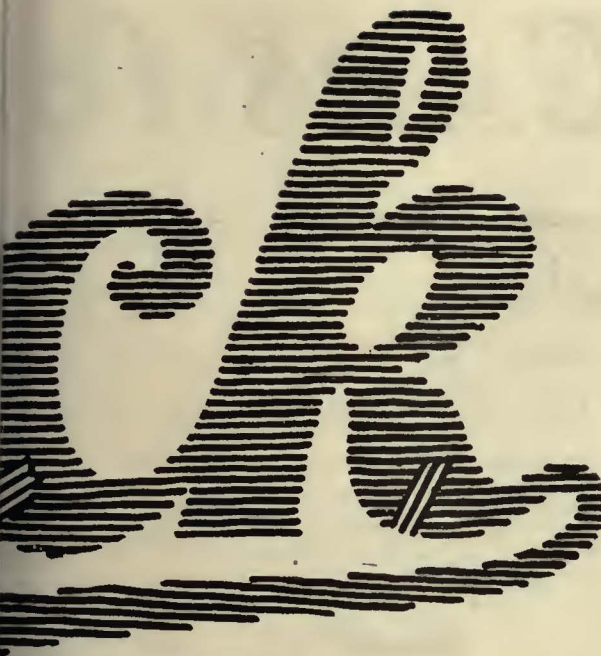
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-the first Mack was a bus





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the Bus you buy?

## Mack Nation-wide distribution demands Service -and gets it!

Mack buses are in operation in every State in the Union except one. When highway conditions improve and the population requires buses, that State, too, will fall in line.

Such nation-wide distribution demands service -- the kind of service, always available, which Mack is organized to render.

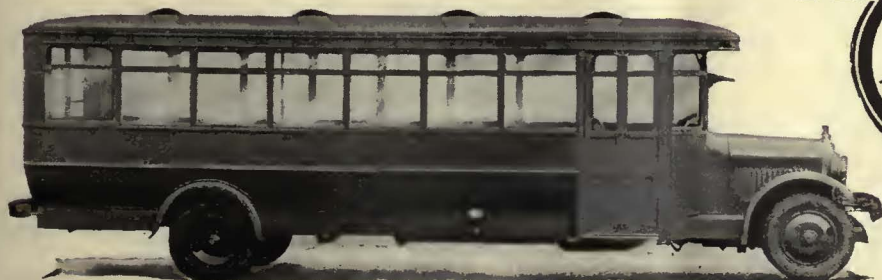
Situated at strategic and convenient points throughout the country, one hundred direct factory branches stand solidly behind the Mack owner with Mack-trained mechanics and several million dollars' worth of stocked parts. Parts and supplies are ready-to-ship at a moment's notice.

The Mack organization stands behind a Mack, *always*, as a matter of business responsibility. Parts are still in stock for the oldest Mack bus, built more than 20 years ago.

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INTERNATIONAL MOTOR COMPANY  
25 Broadway, New York City

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



The  
**Mack**  
Bus

# MODERN CARS for

**John A. Beeler said—**

“Ways and means must be found to replace the 25,000 obsolete cars in the industry. Lighter, more attractive cars are a profitable investment from every possible angle.”

*Extract from paper by John A. Beeler, Consulting Engineer, read at the A.E.R.A. Convention, Atlantic City, N. J., Oct. 8, 1925.*

*This is the third of a series of advertisements devoted to Modern Cars.*

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**St. Louis Car Company**

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 SELF PROPELLED RAILCARS - BUSES  
 STEAM RAILROAD COACHES AND FREIGHT CARS  
 SEATS, CURTAINS, TRIMMING AND GENERAL RAILWAY SUPPLIES  
 BRICKS, BRASS, GRAY IRON AND MALLEABLE CASTINGS  
 STEEL FORGINGS

St. Louis, Mo., Jan 25/26

*TO THE ELECTRIC RAILWAY INDUSTRY:-*

Mr Beeler has stated the problem and has pointed the way to its solution. The financing of much-needed modern cars has been usually if not always the stumbling block for the electric railway managements. Now that a number of modernized railways have been operating up-to-date equipment long enough to afford actual data on results, there is no longer any question as to the ability of new cars to pay their way on most electric railways. Added patronage plus lower operating cost is now a certainty - not a speculation. Specific figures show that a modern car may be expected to earn at least 30% return on its cost.

The St. Louis Car Company is prepared to make a study of the equipment conditions on any railway, and to assist in arranging the financing details for suitable new cars to increase traffic and reduce expenses.

Respectfully yours,  
*Edwin Shearer*  
 President & General Manager

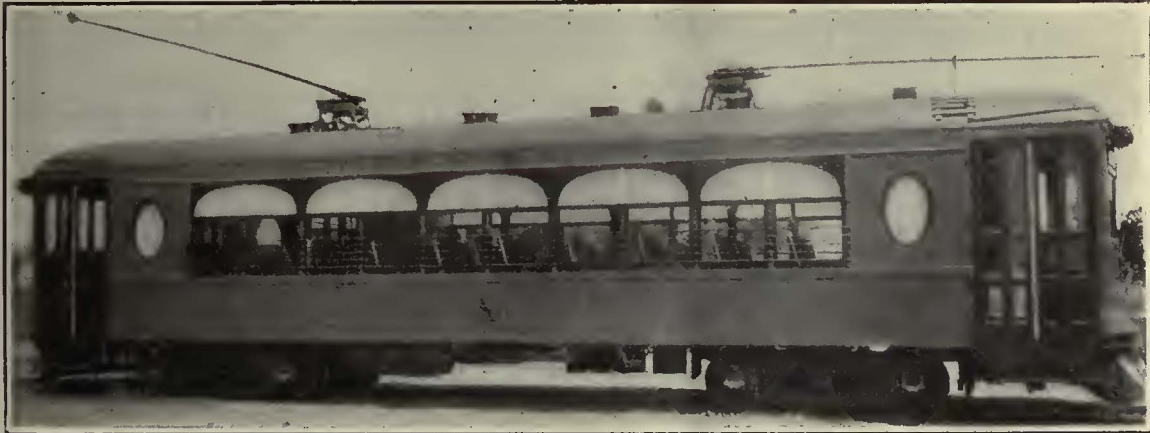
EBM/D

# Modern Conditions—

Springfield and Xenia Railway Co., Springfield, Ohio

recently placed in service light-weight, one-man, two-man, double-end, Interurban cars built at the QUALITY SHOPS of the St. Louis Car Company. These attractive looking cars are 43 ft. 0 in. long over all with passenger and smoking compartments, and a seating capacity of forty-six. The cars are equipped with St. Louis Car Company trucks and seats. Motor equipment—quadruple thirty-five horsepower. Weight complete *eighteen tons*, replacing old equipment which weighed from thirty to thirty-five tons.

## Quality Cars

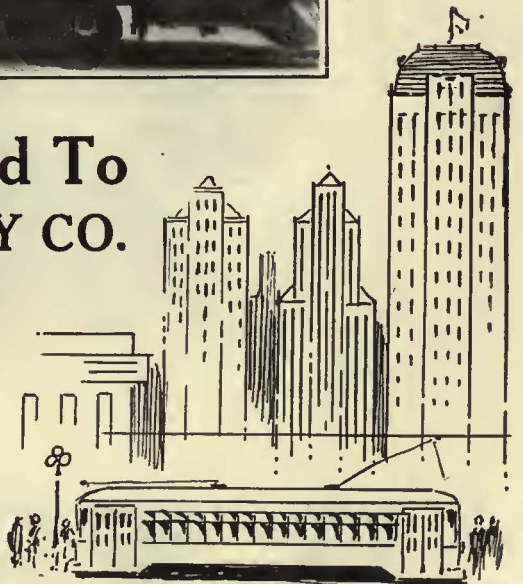


New Cars Recently Delivered To  
 SPRINGFIELD AND XENIA RAILWAY CO.  
 SPRINGFIELD, OHIO

by

St. Louis Car Company  
 St. Louis, Mo.

*"The Birthplace of the Safety Car"*



GAS-ELECTRIC DRIVE MEAS

# No more shifting of gears!

From start to full speed  
with foot control—faster,  
smoother, safer—no shocks  
of changing gears and  
clutch engagements, no  
vibration of over-speeding  
engine when you have

## Gas-Electric Drive

(for buses and trucks)



Consult the General  
Electric Company be-  
fore you buy buses to  
be sure proper electrical  
equipment is applied.

**G E N E R A L**  
GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK

**NO OVER COST FOR BETTER TRANSPORTATION**

**N**O "shifting into second" on the hills, no working up to "high" after every stop or slow-down, never a stalled or racing engine if you have Gas-Electric Buses.

Gas-Electric Drive relieves the operator of this work and responsibility and gives him full control. His undivided attention is on maneuvering the bus because

the foot pedal automatically governs speed throughout the entire range. Acceleration is more rapid, and it is uniform.

Gas-Electric Drive is an entirely modern, superior and proved method of converting gas-engine power into a steady, propelling force at the wheels.

**Maintenance Advantages**

*Inspection and testing of engine are simplified, made systematic and conclusive.  
 Engine cannot be raced or stalled and average engine speed is lower—prolonging life of bearings, pistons, cams and all other moving parts.  
 Sutch, gears and differential—all subject to high maintenance—are eliminated.  
 Without the shock of gear changing, the life of engine, chassis and body is longer.  
 Uniform torque of electric drive means less tire wear.  
 Engine lubrication is materially less.*

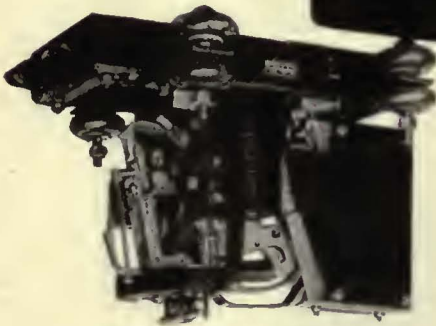
**Operating Advantages**

*Greater riding comfort—no vibration or jerks during starting, and smooth acceleration.  
 Increased safety—control entirely in foot pedal relieves operator's hands for steering—skidding is minimized by individual drive on rear wheels—engine cannot stall on dangerous crossings.  
 Higher schedule speeds—through more rapid acceleration and reduction of driver fatigue—affording lower costs and higher receipts.*



11-18

**ELECTRIC**  
 OFFICES IN ALL LARGE CITIES



*The cover is readily removable*

The new G-E Line Breaker control handle replaces the usual main operating handle of the controller, as well as ratchet-switch, slip-ring or cam-operated contacts, which previously have been placed inside of the controller. It makes installation of line breaker equipment easier and operation better than ever before.

## This G-E Line Breaker is new and better

### Reasons why it is better:

Lighter weight—in line with the lighter weight of modern car equipment.

The cover is readily removable—permitting access to working parts.

Parts are more accessible—which also facilitates inspection.

Improved blow-out.

Less installation expense—made possible by the new operating handle.

If you are not familiar with the purpose and advantages of Line Breakers, get in touch with our local railway specialist.



# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES

# Electric Railway Journal

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

Published by McGraw-Hill Company, Inc.

MORRIS BUCK, *Managing Editor*

Volume 67

New York, Saturday, January 30, 1926

Number 5

## Valuable Study on Franchises Is Expected

FOLLOWING an extensive tour of Europe, the Illinois legislative committee which is making an investigation of franchises, with particular reference to terminable permits, is now touring this country. Legislative junkets are not unusual, but seldom is a study of this magnitude made. This committee has nearly two years from the date of its formation in which to report. In this interval and with the opportunity to study so many cases first hand unusual means will be available for compiling one of the most complete works on modern franchises.

In some respects the opportunity before this committee is like that of the legislative committee of the State of Massachusetts formed years ago to investigate the relationship between street railways and cities and towns. That committee, after extensive studies here and abroad, published in February, 1898, through its secretary, Charles Francis Adams; what remains to this day one of the most complete works on franchises. In this case the conclusion was that the best form of franchise was a revocable permit. Revocable permits are still common in Massachusetts, although that state has not adopted the more complete type of terminable permit which is especially adapted to state regulation and which was introduced by Wisconsin in 1907.

Today only eight states provide for terminable permits for street railways. And in these eight states there are quite a number of companies operating under term franchises. The American Electric Railway Association in 1924 prepared a report on this subject favorable to this form of franchise. Investment bankers favor the terminable permit. Moreover, the National Municipal League and other civic associations have repeatedly indorsed this form of grant.

Two considerations have militated against the terminable permit. Public utility operators have not acted in concert to support it and the provisions in some of the terminable permit laws have made them undesirable. Provisions that institute a form of city control or that permit cities to levy heavy special taxes against utility corporations tend to make such laws unpopular in a time when the tendency is toward reducing the amount of taxation that must be passed on to the consumer. It has been realized for years, especially since the period of difficulty in financing electric railways which followed the war, that the terminable permit is the modern form of franchise. Error, if error there be in the terminable permit, does not lie in the permit as a form of grant, but rather in the lack of proper application of the principle back of the idea.

The members of the Illinois legislative committee have the benefit of years of regulatory experience and a historical background of 27 years more of public utility control and regulation than did the Massachusetts committee in 1898. They have the opportunity within their

grasp to produce a report that every one interested in public utility regulation will want to study and one that every operating company will want in its library. It can only be hoped that the Illinois terminable permit bill, for no doubt there will be one, will be so inclusive as to mark an epoch in the history of franchise settlement matters.

## Governmental Stinginess Again Threatens Efficiency of Patent Office

FUNCTIONING of the United States patent office has been improved recently by increased salaries for examiners, but its efficiency is now being impaired for another reason. Federal judges, under whom exclusively the adjudication and enforcement of patents are performed, are resigning because of inadequate salaries. Men well versed in patent law are leaving the bench and are being replaced by men who will have to become proficient as they decide cases. These federal judges do not have opportunity to add to their incomes by outside work.

United States district judges receive \$7,500 per year, circuit judges \$8,500. Judges of the Supreme Court in the state of New York receive \$17,500; in New Jersey \$18,000; Pennsylvania \$17,500; Illinois \$15,000; Massachusetts \$12,000; Michigan \$10,000. The federal judges have social and professional obligations at least equal to the obligations of state judges, but their salaries do not permit the filling of their obligations, especially in the larger cities.

There are 191 federal judges in the United States and their present combined yearly salaries amount to \$1,535,991.91, about 1½ cents per inhabitant. Bills providing for an increase of about ½ cent per inhabitant have been introduced into Congress. They provide for raising the salaries of the chief justice of the United States to \$20,500; associate justices of the Supreme Court to \$20,000; circuit judges in the second circuit, comprising New York and Vermont, to \$15,000; circuit judges in the four next most populous circuits to \$14,000; and circuit judges in the remaining of the nine circuits to \$13,000.

The bills provide for the district judges \$10,000, with the provision that if the population in a district exceeds 2,000,000 the salaries shall be increased \$500 for each 100,000 population in excess of that sum up to within \$1,000 of the circuit judge's salary. If the differential in favor of the salaries in the more populous districts should not be enacted, then the salaries for the district judges in general should be correspondingly raised.

These proposed increases are in no way extravagant. Certainly it is well for industry to have the federal judges, who handle its patent cases, free from the personal financial worries bound to exist when salaries are inadequate; free to give the careful thought and concentration demanded by their judicial duties.

## They Are Talking It Over Again in New York

**M**AYOR WALKER of New York has at least started right with respect to the traction problem. He appears anxious to do what he can to help and to make good on his pre-election promise to bring some measure of relief. As a first step in that direction he recently had the members of the State Transit Commission and the City Board of Transportation confer on the situation as it now stands. Since then he has conferred with officers of the Interborough Rapid Transit Company.

With the Mayor's own proposal of debt exemption for city bonds to be used to finance new construction there is much chance to find fault on the score that it is unsound economics. At best it would take several years to have his proposal enacted. It is hardly in place here to refer to the suggestion except that it indicates one trend of thinking. As for the Transit Commission, General O'Ryan still thinks that the plan of unification of the transportation lines, first advocated by that body several years ago, is the best move that could be made looking toward an improvement in the situation in the near future. Altogether, there are many suggestions of ways to accomplish a much-needed result. Some of these suggestions are practical, but as indicated before, many are highly impracticable.

There is no need now to attempt to analyze even the most important of the proposals made. The matter has not yet got beyond the discussion of preliminaries. The important point is that the discussion is in tones of helpfulness and not of recrimination. That in itself is distinctly a pleasant change. But pleasant as it is, it is after all action that is needed. The public officials most intimately concerned and the representatives of the railways may hobnob under the most favorable business relations, but unless the former do more than that the public will be no less inclined to find fault with their elected representative than they were when the principal incumbents of City Hall vied with contestants at Madison Square Garden for sporting honors and public officials said it with slang instead of with shovels.

## Outworn Arguments Advanced Against Interstate Common Carrier Regulation

**L**OUD wails of anguish are heard in certain quarters because a bill to regulate interstate commerce by motor vehicles operating as common carriers on public highways has been introduced in the United States Senate. The Truck Users National Conference is distributing a pamphlet in which the proposed legislation is described as "a menace to motor carriers." Threats of "confiscation" and "monopoly" are carried in this bill, says the association. Sponsorship of the bill is attributed to the American Electric Railway Association, the American Railway Association and the National Association of Railroad and Utilities Commissioners, and this seems enough to condemn it in the eyes of the truck users. All the familiar arguments against a regulated monopoly and favoring unrestricted competition are paraded again.

One is reminded of the passage in the Bible telling that "now there arose up a new King over Egypt which knew not Joseph." From time to time there arises a new generation which knows not that our present sys-

tem of utility regulation was arrived at after long and costly experimentation. Worn out and discarded theories concerning the desirability of competition in providing transportation facilities are brought forward as new discoveries.

What would the unlicensed interstate common carriers say if the electric and steam rail lines, now so closely regulated, should participate in a general free-for-all scramble for traffic by cutting rates? Would the unregulated carriers like that? Probably not. For others they believe in careful supervision that compels the provision of regular and adequate service at reasonable rates. For themselves they want the privilege of coming and going as they please, and particularly of charging whatever rates they please.

But public memory is short. Many people have forgotten and others perhaps never knew that this question was first raised many years ago, and that experience has shown in countless cases that the public benefits most when transportation is a regulated monopoly. So long as these outworn arguments are advanced against regulation the railway companies must remain alert and aggressive in answering them and demonstrating their fallacy.

## Customer Satisfaction a Goal for the Railway Operator

**O**CCASIONALLY there is cause for condemnation as to why some men fail and why others make good in business. Men are heard of who are especially successful in real estate, in baseball, in music and in many other fields. Why should not a little of their acumen be applied to the hard-working business of local transportation? A recent example is one "Red" Grange, who broke from the sporting sheet into the front pages of the newspapers so frequently a few months ago that many began to wonder what all the fuss was about. Attendance at professional football games jumped from twenty and thirty thousand to fifty and seventy thousand. The sport writers say the answer is that "the customers leave satisfied." They came for thrills, runs and surprises; saw what they wanted, left satisfied, and told the world about it.

How can a railway develop enough interest to double its business? Maybe it can't, but it can help things along quite a little by "satisfying the customer." Too many of our railways are doing things not because the public wants them, but because they are following tradition and give the public no choice in the matter. If they think longitudinal seats will enable them to crowd more passengers into a car they turn a deaf ear to a public that wants to face forward when it rides.

The companies that have consulted with the public about their cars, their seating arrangement, and similar matters, have done much in this regard. Even little trick devices that do not save money but give a little element of surprise help a great deal. The rush-hour crowd says to the folks at home, "Have you seen the new bulletin boards on the cars," or "How do you like the cushions on those new seats," and in other ways takes an interest in the car ride instead of regarding it as a part of the daily drudgery of going to and from work.

Sad tales of paving burdens, high taxes and other inequalities to which they are subjected will do the railways no good unless they "satisfy the customers."



## "Co-ordination"—Theme of New York Railway Association Meeting

PART of the work of furnishing co-ordinated transportation is the molding of a co-ordinated viewpoint. That this latter has been about accomplished was evident to members of the New York Electric Railway Association who were privileged to hear the addresses of E. F. Wickwire and John A. Ritchie at the mid-winter dinner of that association in New York on Jan. 27.

The bus arrived in the field when the electric railway industry was at a low ebb and succeeded in living "off it" for some time. Mr. Wickwire said the industry was better now and was not going to stand that treatment any longer, but was making adequate plans for having the bus live "with it," assuming its own duty and accepting its own responsibility.

Mr. Ritchie, on the other hand, having lived through early bus days, recognizes the street car as typifying an industry with experience and financial backing. He recognizes the futility of strife and the desirability of co-ordination. He expounded the theory that *ELECTRIC RAILWAY JOURNAL* has often expressed that a co-ordinated operation carries with it the responsibilities of a co-ordinated investment. If rail lines are to be abandoned the successor vehicle must be allowed to earn a sufficient amount to retire the original investment. Otherwise what attraction will there be in transportation investments if the old money must be lost every time the wind changes and a new type of vehicle or method comes into the field?

Many other expressions of these two men, typifying, as they do, the railway viewpoint on the one hand and the bus on the other, show the progress that has been made in welding these two great ideas into one of greater service in the field of transportation.

## Internal Co-operation the Main Objective in Modern Corporations

THE greatest objective in modern industrial personnel work is to secure the maximum amount of co-operation between all departments and between all the individuals in each department. Years ago, when corporations were small, very little effort was necessary to bring about this co-operation. Most of those engaged in the same shop knew each other and took an interest in what their fellow workers were doing. As corporations grew in size, the interest of the average worker in the success of the company as a whole naturally became less. His weekly pay envelope, rather than the financial interests of his employers, was the most conspicuous object on his mental horizon.

Within recent years effort has been made by most large companies to correct this situation as far as possible, and a number of electric railway companies have led in this movement. The task is not an easy one, because as a company grows in size, it becomes increasingly more difficult to diffuse through all of the departments an interest in the work and knowledge of the policies of the company. It is fortunate, therefore, that a paper on ways of securing internal co-operation was presented at the meeting this week of the New York Electric Railway Association, by an official in a company which has been conspicuous for its success in this direction.

Dr. Segard has no wonder cure for bringing about the result sought. His remedy is the simple one of educa-

tion on the aims of the company, coupled with encouraging a willingness on the part of each worker to give to his fellows and receive from them all the helpful assistance possible. This means also, of course, a readiness to receive these suggestions and other assistance in the right spirit, because, with most people, so far as suggestions are concerned, it is far more blessed to give than to receive. Nevertheless, the man who is unwilling to accept suggestions, associate with others in business on a friendly basis and help them with his own experience has largely outlived his usefulness.

## Methods of Training Future Executives Deserve Careful Consideration

SYSTEMATIC training for young men for executive positions in the electric railway industry was advocated in a paper by R. E. Danforth presented at the midwinter meeting of the New York Electric Railway Association. Ordinarily, suitable material for future executives is to be found in any organization of considerable size. How best to insure its development is the problem. That the solution should be left to chance is unthinkable. In the opinion of Mr. Danforth, schools for trainmen, lectures, etc., do not go far enough. A definite program is needed for the selection of promising candidates for advancement and their subsequent training.

It must be admitted that many of the present executives of the electric railway industry have risen from the ranks by their own perseverance and effort without any special course of training. Why, then, bother to train young men for executive positions? Times have changed and the industry itself has changed. It has grown in size and complexity. Competition unknown 20 years ago has reached a serious stage today. Methods of training and advancing employees should be modernized just as much as the physical plant.

Experience alone does not today fully equip the individual for an executive position, nor does an education, whether technical, legal, scientific or classical. Other qualities are needed today, including the ability to express one's ideas clearly and to get them across successfully to others. Familiarity with the practices and work of all departments of the railway is valuable to those suitable for advancement. Opportunity to gain such knowledge should be given to the more able and progressive men of the organization.

Young men should be selected for this purpose when first employed, according to Mr. Danforth's theory, or soon thereafter. High school graduates should be shifted from department to department systematically for a year or two, to give them a working knowledge of the methods and problems of each. These young men may then be placed in the ranks of any department and permitted to grow up there until age, experience and evident ability show them ready for promotion. For others who have had college educations, he advocates a cadet engineer's course, after the completion of which they may be placed in minor supervisory positions, used as executive clerks to the general manager, or placed on the engineering staff. As one of the pioneers in the field of systematic training of young men in the electric railway industry, Mr. Danforth speaks with knowledge and experience, and his opinions deserve the careful consideration of the present executives.



One of the New Cars. Steps Are Unnecessary Because High Level Platforms Are Used at All Stations

## New Cars for the Chicago Elevated

Several Features Are Included to Give Greater Convenience and Comfort, Although the New Equipment Is Practically a Duplicate of that Already in Service

*By Colin K. Lee*

General Engineer Westinghouse Electric & Manufacturing Company

ONE HUNDRED new steel cars have been ordered by the Chicago Rapid Transit Company recently to increase the service on its elevated lines. The electrical equipment is virtually a duplicate of that ordered in 1922, and that in turn was practically a duplicate of the 1914 order. An accompanying table gives the principal dimensions of the new cars. Particular attention has, however, been given toward providing a car of pleasing appearance both inside and out.

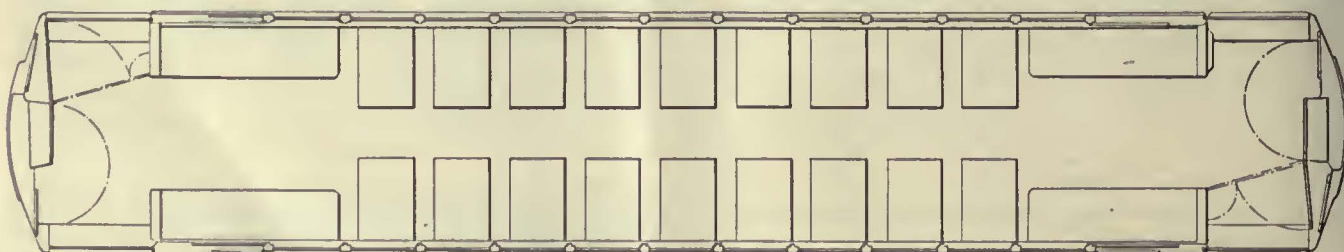
Seats are provided for 52 passengers. Thirty-six can be accommodated on the cross-seats. Four longitudinal seats, one at each corner of the car, provide for the remaining sixteen passengers. The seats are soft and plush covered. They are a trifle wider than those usually found in city service, being 37 in. wide. The seat spacing is 32½ in., which also provides somewhat more knee room than is usually found. The increased width of the seat has narrowed the aisle somewhat, so that this is but 21½ in.

Hand straps of a white enamel rigid type are used only at the ends of the car over the longitudinal seats, which are 6 ft. long. Looking through the car from one end, the passenger is impressed particularly with

the unobstructed view. There are no vertical stanchions in the line of vision, which usually give a crowded appearance, regardless of their desirability for convenience of standees. The clear vision of the passengers is also extended to the side windows, which are arranged particularly to give an unobstructed view outside with no guard railings. Plate glass gives a rich effect and there is no danger of outside objects presenting a wavy appearance.

Arch-type roofs are used and the line where the roof joins the end partition has a simple graceful curve. Lights are arranged in three rows, one down the center of the car and one row on each side. The lighting fixtures are attractive. Deep translucent shades shield the lamps so that direct rays do not annoy the passengers. Efficient lighting is obtained through the use of the white enameled arch ceiling. The interior finish, aside from ceiling and floor, is mahogany. Twelve ventilators are arranged in the roof. In addition, two 12-in. electric fans are provided, one at each end of the car. These fans are driven from a storage battery.

Particular attention has been given to make the car warm and soundproof. Thick salamander insulation



Floor Plan and Seating Arrangement of the New Cars



Seats Are Wide and Plush-Covered. Lighting Is Good and Passengers Are Afforded an Unobstructed Vision



Short Longitudinal Seats at the Doorways Help to Prevent Congestion by Providing a Wide Aisle at Ends

is used, with double wood floors on top of the steel plates. Exposed sheets, such as sides and letterboards, are of Armco iron. Other details of reconstruction include 12.25-lb. I-beam center sills, 6-in. channel side sills, 1/8-in. pressed cross-sills, 1/8-in. continuous floor plate, 1/2-in. steel headlining and pressed steel side posts and doors.

The motive equipment consists of two Westinghouse No. 567-R-1 motors, both mounted on one truck. These motors are a standard Westinghouse type, slightly modified to meet local conditions. Covers and axle caps are chained to the frame as a loose piece is particularly undesirable in elevated car operation. Other important

features of this ventilated motor include through axle cap bolts, bolted commutator, dust guards, axle shields, tapped field, pressed steel gear case, etc. Strap windings are used without sharp crossovers. The control is type ABLFM, which includes automatic acceleration, energy control supplied either from battery or direct from the line and field control for the motors. It is arranged for operation in conjunction with existing elevated equipment, which includes General Electric type M.

The motorman's compartment occupies the front right-hand side of the platform at each end of the car. This is inclosed by a door which stands lengthwise



At Left—Motorman's Compartment Is Located at the Front Right-Hand Side of the Car. When Not in Use It Is Made a Part of the Vestibule by Closing the Door to Conceal the Operating Equipment. At Right—The Switch Panel Is a Completely Inclosed Unit on the Platform

Principal Dimensions and Equipment of Chicago Rapid Transit Cars

Number ordered .....	100	End door opening .....	22½ in.	Couplers .....	Sterns & Ward automatic— Van Dorn automatic
Builder .....	Cincinnati Car Co.	Truck centers .....	33 ft. 8 in.	Door-operating mechanism.....	National Pneumatic
Seating capacity .....	52	Wheelbase motor truck .....	6 ft. 6 in.	Heaters .....	Consolidated Car Heating Co.
Length over all .....	48 ft. 0 in.	Wheelbase trailer truck .....	5 ft. 6 in.	Motors..Two Westinghouse 567-R-1, 170 hp, at 600 volts	
Length over body .....	37 ft. 10 in.	Diameter wheels motor truck.....	34 in.	Seating material .....	Plush
Length of platform .....	5 ft. 1 in.	Diameter wheels trailer truck.....	31 in.	Trucks.....	Baldwin Class 66-30-AT, Special, and Baldwin Class 78-30-A, Special
Extreme width over eaves.....	8 ft. 10½ in.	Height rail to center of drawbar.....	29½ in.	Ventilators .....	Railway Utility Co.
Width over side sheathing.....	8 ft. 6½ in.	Post centers .....	2 ft. 7½ in.	Wheels.....	Driving truck, 34 in.; trailer truck, 31 in.
Rail to bottom of side sill.....	3 ft. 2 in.	Weight complete .....	76,400 lb.		
Rail to top of roof.....	12 ft. 3½ in.	Body .....	Steel		
Width cross-seats .....	37 in.	Interior trim .....	Mahogany		
Length of aisle .....	21½ in.	Roof .....	Arch		
Length of longitudinal seats.....	6 ft. 0 in.	Air brakes .....	Westinghouse type AMU.		
Sliding side door opening.....	3 ft. 8 in.	Control .....	Westinghouse ABLFM		

of the car when occupied by the motorman. When not in use the door swings forward and incloses the motorman's control devices. The control equipment must thus be capable of installation in a comparatively narrow space. The master controller is type XM-110. It is provided with three drums, placed one above the other, with three concentric operating shafts. The reverse handle is arranged so that it cannot be left when the motorman leaves his post.

A new feature is the arrangement of the switchboard equipment. A full length steel cabinet is built into the platform face of the bulkhead at the left side of the platform. This contains the panel bearing, three heater switches, switches for lights and air compressor and the large knife switches for trolley and third rail, heat and light bus, main motors, air-door-switch cut-outs, together with the necessary fuses. Each item is marked plainly, and in spite of the large number of devices the space occupied is surprisingly small.

Fellowships Offered in Transportation

FIVE Strathcona Memorial Fellowships in Transportation, of \$1,000 each, are now being offered annually for advanced work in transportation at the graduate school of Yale University. Special attention will be paid to the construction, equipment and operation of railroads and other engineering problems connected with the efficient transportation of passengers and freight, as well as the financial and legislative questions involved. Transportation by water, highways or airways and the appropriate apparatus involved, and also other general aspects of the broad field of transportation, embracing its legal and economic phases, will be included in the list of subjects which the fellows may select for investigation and study. The holder of a fellowship must be a man who has obtained his first degree from an institution of high standing. In making the award, preference is given, in accordance with the will of Lord Strathcona, to such persons or to the sons of such persons as have been, for at least two years, connected in some manner with the railways of the Northwest.

Applications for these fellowships should be addressed to the dean of the graduate school of Yale University, New Haven, Conn., before April 1, on blanks which may be obtained from him. Applicants must submit with their application a brief biography and a certified record of their previous courses of study in college or technical school and their standing therein. They should also submit testimonials bearing upon their qualifications. A recent photograph of the applicant is requested.

Various courses of study relating to transportation along engineering, economic and legal lines are now offered by Yale University. Upon completion of the pending survey of various fields of transportation and

the character of instruction and investigation therein there may be anticipated some rearrangement of certain of the courses above cited and some amplification thereof. Pending such adjustment, the Strathcona Memorial fellows will be entitled to pursue investigation in those aspects of transportation in which the university now offers competent guidance and supervision.

Reducing Gear Noise

Tests on a Large Variety of Motor Gears Show that the High-Pitched, Bell-Like Tone Which Is Most Penetrating and Annoying Can Be Reduced by Bolting on Pads of a Rubber-Asphalt Material

By E. S. SAWTELLE

Assistant General Manager Tool Steel Gear & Pinion Company, Cincinnati, Ohio

NOISES of two distinct types emanate from electric railway car gearing. The first is a low tone vibration or rumbling, which comes primarily when the gears and pinions are not meshed properly for perfect involute action. The second is a high-pitched, bell-like tone which is found to have great penetrating and carrying power. Concerted efforts are now being put forth by electric railway operators and manufacturers of railway equipment to reduce all types of noise which come from car operation. For some months the writer has been carrying on tests in an effort to find a solution for the problem of reducing the noises which come from ringing gears and which are particularly objectionable to car riders.

The low tone vibration or rumbling which comes from car gearing is due either to worn gearing or to worn or poorly maintained bearings, which permit spreading of the gear and pinion centers. In the extended observations which I have made I have found it extremely unusual for new gears and pinions to produce undue noise. The most obvious solution for reducing the rumbling type of noise is to correct bearing troubles, maintain closer gear and pinion centers and where the gearing is excessively worn to replace it. On many properties gears are left in service too long for quiet operation, as these properties consider the replacement of gears too expensive, and so they are left in operation, despite the increased noise.

The introduction of helical gears was based primarily on noise elimination. Reports of the equipment committee of the American Electric Railway Association for several years past indicate that this type of gearing has reduced gearing noises. This type of gearing, however, like the spur type, cannot be expected to be in the best operating condition if bearings are permitted to become badly worn or if the gear and pinion are excessively worn or in poor alignment. Observations of helical gears in service show that where

excessive noise is found this is due mainly to their being in a worn condition.

The low-toned rumble of gearing is akin to the general industrial noises which prevail in most of our cities and is not considered as decidedly objectionable. In reducing noises, however, any steps which will curtail or eliminate the low-toned noises are in the right direction. Certainly a higher grade of maintenance which will give more attention to bearings and to worn conditions will result in other benefits to the car equipment as well as materially reduce the low-toned noises.

The high-pitched, bell-like tones which have great penetrating and carrying power are the second class of noises frequently found in gearing. These are extremely annoying and frequently can be heard for a square or more as the car approaches. This class of noise has been found to come almost exclusively from forged gearing, which has a bell shape, and it is seldom encountered in the spoke type of gear made from a steel casting. The latter, however, has become practically obsolete for railway cars.

I have made a large variety of tests in an effort to reduce the shrill ringing noise. These efforts have been confined principally to bolting blocks of wood or similar material to the gear or to packing some quieting material, such as cork or sawdust, against the gear.

The use of such material has proved only partly successful. A few months ago I became interested in a rubber-asphalt material marketed by the Philip Carey Company for track installation. This was tried on gears in an



Pads of Rubber-Asphalt Material Bolted to Web of Gear Have Been Found Effective for Reducing Gear Noise

effort to reduce the ringing sound. The first test was conducted on a test machine and in my own shop, with gears mated in such a manner as to generate the ringing noise. When pads of the rubber-asphalt material were bolted onto the webs of the gears the ring was almost completely eliminated. Observations, however, showed that the low-toned rumbling sound previously referred to was not particularly affected by the addition of the pads. After these preliminary tests, a particularly noisy crane installation was observed with its gearing operated in an exposed position. Noise from this crane could be heard for a distance of about two squares on a clear day. Elastite pads were attached and the noise was so reduced that it was noticeable only when standing directly beneath the crane.

In order to extend the tests to gearing in actual electric railway service pads of the Elastite were sent to a large number of railway companies that are making experiments in deadening car noise. Satisfactory results were reported in practically all cases. These tests are now being extended so as to include a large number of companies. I expect eventually to have some very interesting reports. Thus far the tests have

been confined to cars which have been picked out for noisy gearing. When they have been brought into the shop for installation of the silencing material it has been found invariably that the gears were somewhat worn and that the noise primarily was a result of the wear. Application of the sound-damping pad shows that gears, even in their worn condition, can be operated without much objectionable noise. If the use of such pads will enable gearings to be continued in service for a longer time, this practice is certainly commendable. The pads are comparatively inexpensive and can be attached readily to any railway gear by bolting through the web holes.

An accompanying illustration shows a typical installation. Two pads appear sufficient to kill the most objectionable noises. They are bolted in the deep side of the web, care being taken to have the pad made so that it presses tightly against the rim and against the hub. Ordinary machine bolts are used with an arrangement so as to lock the nut on the pad side and with a fixed rectangular metal washer spot-welded to the head of the bolt on the back, in order to keep it from turning and from pulling through the web hole. In most cases these pads can be attached by merely dropping the gear case.

From the tests so far conducted it appears that only exceptional gears have sufficient ringing noise to need silencing pads when in proper condition. It would thus seem undesirable to put the pads on all gearings, but rather to carry a small supply in stock for use whenever a car is found in which the gears are exceptionally noisy and still not worn sufficiently to warrant replacing. The Tool Steel Gear & Pinion Company, which has been conducting tests, is not financially interested in the sale of the pads, but through the co-operation of the Philip Carey Company has been obtaining them without charge for railways interested in testing out their use. Inasmuch as the pads must be made to fit the contour of the web of the particular gear on which they are to be attached our engineering department has been working up drawings for such installations and is helping in every way possible to get the tests started.

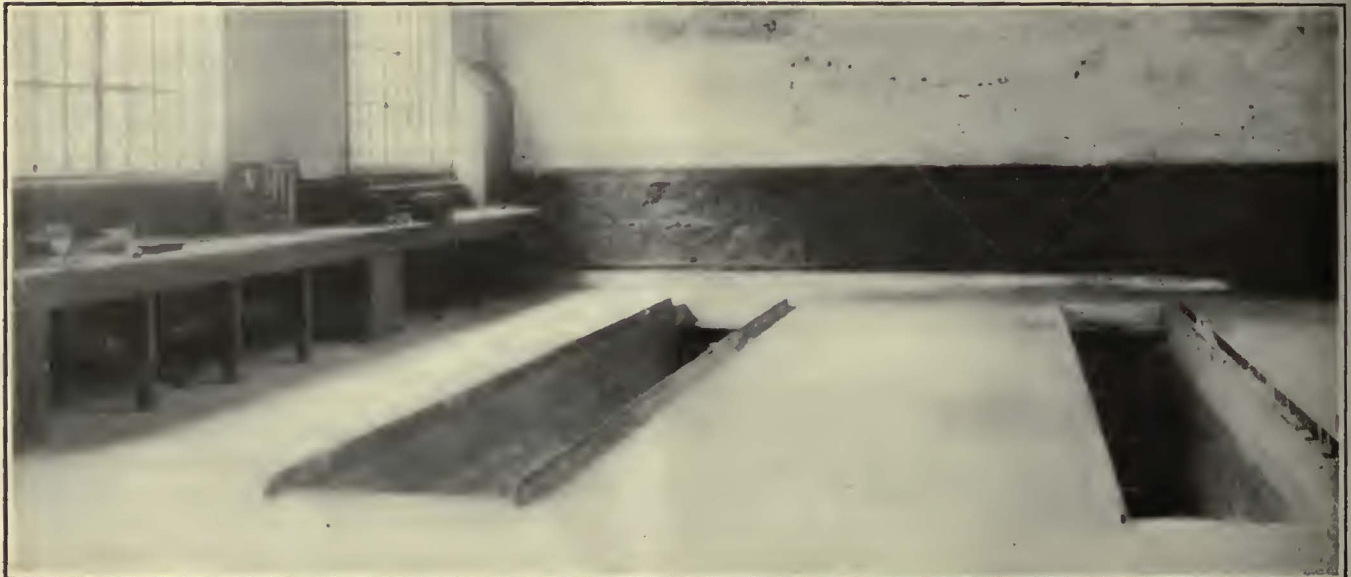
## Electric Locomotive Demonstrates High Overload Capacity

**T**O DEMONSTRATE the temporary high overload capacity of an electric locomotive as against a steam locomotive, the Chicago, Milwaukee & St. Paul Railway recently conducted some tests at Hyak, Wash., on the Cascade division of the Milwaukee's electrified line. For the purposes of the test, an ordinary bi-polar electric locomotive, having a maximum tractive effort of 137,000 lb., such as is used on passenger service on this division, was coupled to a type "C" steam locomotive, having eight driving wheels, and weighing with tender about 150 tons, and a Mallet compound, having twelve driving wheels and weighing about 278 tons.

In this test it was found that for short periods of time the electric locomotive pulled the steam locomotives backward against a full head of steam in both, without a rise in temperature in the motor windings sufficient to be damaging. This test was put on to indicate the extreme flexibility in operation of the electric locomotive compared to steam power, which is limited in pulling capacity to the pressure available in the boiler.



Substitution of Steel Beams for Wood Posts Has Permitted the Dubuque Electric Company to Transform an Old Carhouse Into a Roomy Garage



Railway Car Inspection Pits Have Been Retained for Use in Connection with Bus Inspection and Overhauling



An Electrically Operated Spray Washer and a Portable Air Compressor Form Parts of the Equipment of the Bus Garage of the Dubuque Electric Company

# Carhouse Remodeled as Garage

By Replacing Old Wood Roof Supports with Steel Beams and Installing a Concrete Floor the Dubuque Electric Company Has Secured a Roomy Structure for Bus Storage—Railway Car Inspection Pits Have Been Retained and New Equipment Added

By *A. H. Smith*

Railway Superintendent Dubuque Electric Company, Dubuque, Iowa



Entrance to the Garage Is Through an Adjoining Vacant Lot Which Has Been Graded and Paved with Concrete

WITH the inauguration of local bus operation in Dubuque on July 19, 1925, necessitating the purchase of four 25-passenger Mack buses, additional garage space was needed by the Dubuque Electric Company. Bus service was not a new thing to this company, however, as it has been operating buses between Dubuque and East Dubuque for the past eleven years. East Dubuque service was started originally with three electric buses. Owing to battery depreciation these buses were replaced by a fleet of Fords. Later this equipment was replaced by three Dodge-Grahams, which have been in service for the past two years. With only three buses and ten trucks to be cared for, garage space was ample. When bus service became necessary in the outlying sections of Dubuque not served by street cars and the additional buses were bought increased garage facilities were needed.

Instead of erecting a new building a section of the car storage house was remodeled for garage purposes. Dimensions of this building were 55 ft. x 250 ft. The original construction of the building consisted of brick walls with the roof supported by wood beams and posts between the tracks. The rear section was separated by a 12-in. brick partition. This space, 55 ft. x 141 ft., has been arranged as the garage. Aisle sprinklers, trolley wire and tracks were removed. Fourteen 10x10-in. upright timbers were replaced by seven steel girders. The old roof was replaced by asbestos roofing and a semi-collapsible door was installed on the south side of the building.

Adjoining this opening is a vacant lot, formerly used

to store track materials. This was graded and paved with concrete. A rip-rap retaining wall was built at the end of the driveway on account of an incline rising at that point. A concrete curb was needed in another place to hold up an old wall on adjoining private property.

Near the entrance to the garage a 1,000-gal. gasoline tank with a Bowser pump of 5-gal. capacity was installed. Buses are filled with gas before entering the garage at night and immediately after entering are washed, serviced and stored along the wall. Four lighting standards constructed of pipe and containing 200-watt lamps spaced 30 ft. apart illuminate the driveway at night.

The interior is open for its entire length. Twenty buses can be accommodated in this section of the building. It has a concrete floor with two inspection pits, a work bench and a wash rack situated at the rear of the building. The old railway inspection pits have been retained and equipped with guards to keep the bus wheels from running over the edges. Nine windows with steel sash, seven on the south side and two on the north side, furnish ample daylight. Inasmuch as the garage is used principally at night, artificial illumination has been provided by means of sixteen 100-watt shaded lamps, vertically suspended from the ceiling.

Other equipment of the garage consists of an electrically operated spray washer, a portable air compressor for inflating tires and an Alemite grease gun. Ample electrical connections, both 110-volt and 220-volt, are provided for portable extension cords.

## Rapid Overhauling Permits Maximum Holiday Service

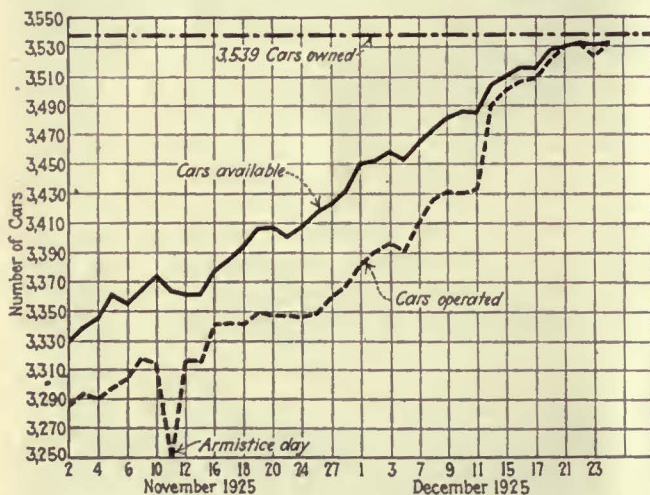
On Two Days Last December the Chicago Surface Lines Operated 99.8 per Cent of All Passenger Cars Owned

BY H. H. ADAMS

Superintendent Shop and Equipment, Chicago Surface Lines

**F**ORESEEING a heavy Christmas business, the executive officers of the Chicago Surface Lines toward the end of last summer started to make preparations to meet this condition by preparing the schedules required, providing extra men and getting the equipment in condition to meet the requirements. It was the duty of the shops and equipment department to supply the maximum number of cars for this service, and it was decided to stop all overhauling of cars at the two shops and to concentrate all available work on cars sent to the shops for damages.

Results obtained in the matter of service, in cars available and cars operated from Nov. 1 to and including Dec. 24, 1925, are shown in an accompanying chart. This shows that the margin between the number of cars available and the number of cars operated diminished gradually, until on Dec. 21, 22 and 24 the transportation department actually operated all the cars that the shops and equipment department had available. On Dec. 22 and 24 there were available and operated 99.8 per cent of the total passenger equipment owned. In other words, out of a total of 3,539 cars owned, there were available and operated on these two days 3,532 cars. From Dec. 14 to and including Dec. 24 there was available for operation more than 99 per cent of the passenger car equipment. This it is believed is a record which has



Ratio of Cars in Service to Total Cars Available on Chicago Surface Lines—Saturdays, Sundays and Thanksgiving Day Omitted

never been equaled in history for a property the size of the Chicago Surface Lines.

The curve does not include Saturdays, Sundays or Thanksgiving Day, as these days, of course, required a smaller number of cars for operation. It does show, however, a low point for Armistice Day, when the demand for extra cars was considerably less. The figures shown in this curve are taken in the afternoon rush maximum requirement period.

In order to have available for the maximum period

the greatest possible number of cars, the work on overhauling cars began to slow down after Nov. 1 and no cars were taken into the shops for overhauling after that date. There were in the two shops on this date 90 cars undergoing overhauling, and in addition, there were 78 cars in for damage repairs, or a total of 168 cars in the two shops. This total was reduced to a minimum for one day of four cars. This was on Dec. 22, when there were in the South Shops three cars and in the West Shops one car. One of the cars in the South Shops was a car that had been badly damaged by fire and the two others were heavy damages that could not be completed. This was the case also with the one car in the West Shops.

At the carhouses during the month of October an average of approximately 36 cars were held in daily for repairs during the rush hours. This covers a total of sixteen carhouses, or approximately  $2\frac{1}{2}$  cars per carhouse per day. In order to make as many of these cars as possible available for the maximum period, and after the work at the shops had begun to reduce, men from the shops were transferred to the different carhouses to assist in making repairs to the cars. This was particularly true in connection with the work on body repairs, with the result that many cases of cars having damage done to the body, were taken care of by this force so promptly that the cars were not out of service during the rush hours. There were cases where the front of the vestibule was demolished and the car was repaired and put into service the same day for the rush hours. Painting was taken care of by having vestibule posts and parts painted and kept in stock ready for installation when required.

During the week ended Dec. 19 and the four days immediately preceding Christmas, not including Saturday, Dec. 19, there was an average of only two cars per day held in for repairs during the rush hours at the sixteen carhouses. On Dec. 18 there were no cars held in at any of the carhouses during the rush period, showing the effective work that was done.

An increase of somewhat more than 40 per cent in cars overhauled will have been accomplished by the end of the fiscal year, Jan. 31, 1926, as compared with the previous year. This has been brought about by a change in policy in the matter of overhauling. Previous to Feb. 1, 1925, cars had been brought into the shop for general overhauling on a regular schedule, which averaged about  $3\frac{1}{2}$  years between overhaulings. After Feb. 1, 1925, cars were brought into the shop that had been out for the full length of their period, and these cars were given the general overhauling. In addition, cars that had been out for a period of two years were brought into the shop and given an overhauling. This last overhauling was much lighter than the general overhauling given to the other cars, due to the fact that less work was required on the cars. In addition to the fact that an increase of more than 40 per cent of the cars will have been put through this year, the average cost per car has been reduced about 45 per cent over last year's cost.

This more frequent shopping of the cars has resulted in a reduction in maintenance, and the electrical equipment has also been given additional tests and inspections, which have resulted in a marked decrease in the number of failures and an improved efficiency, all of which has resulted in the higher standard which enabled the equipment to meet the supreme test at the time of maximum demand.



# Ferry Car Solves High Water Troubles

Long Island Electric Railway Has Equipped a Special Motor Car and Trailer to Operate a Shuttle Service Through Flooded Section



Flooded Car Tracks Prevent Usual Electric Operation

**E**LECTRIC car service is kept on a regular five-minute schedule with water nearly 4 ft. above the rail with a special ferry motor car and trailer, constructed by T. V. Campbell, equipment engineer for Fisk & Roberts, in the Woodside shops of the New York & Queens County Railway. The section of track which becomes flooded after severe storms extends for some 500 to 600 ft. along Jamaica Avenue between 184th and 186th Streets, in Hollis, L. I. Ten to fifteen floods occur annually. During a recent storm the water was 42 in. above the running rail and flood conditions lasted over a period of five hours, in which the usual type of electric cars could not be operated.

This section has no sewers, and the three divisions of the railway which use the two tracks over this section have a five-minute headway. Before the special equipment was constructed it was the practice to operate cars up to the flooded section, where the passengers got off and walked to the next street north of the section and so around the flooded district. The water was so high that buses and automobiles could not operate through it and the inconvenience to the traveling public was quite pronounced. Receipts on these lines fell off from \$100 to \$125 per day as the result of decreased traveling. The flooded section was so situated that water would come from all directions, as there was not only a dip in the street itself, but the adjacent property on all sides was considerably higher than the tracks. The pavement outside the tracks is asphalt and granite blocks are used in the track area. The nearest crossovers to the flooded section over which cars can be changed from one track to the other is five blocks to the west and 26 blocks to the east. It is thus necessary to operate over a single track for a considerable distance when the street is flooded.

In order to provide transportation through the

flooded district, the electric railway constructed a special motor car and used this in connection with a trailer to operate a shuttle service through the flooded section. The motor car has two motors mounted above the floor level and arranged to drive the wheels of the car through link-chain connections. The car used for this reconstruction was an old Taunton single-truck sprinkler car. This had 33-in. wheels and 6-ft. 6-in. wheelbase. The tank was removed and two G.E.-58 35-hp. motors were installed above the floor level. The gears which originally were on the axles of the car were installed on a countershaft and two sprocket wheels obtained from old sweeper equipment were also installed on these countershafts and on the truck axles so as to provide a link-chain drive between the countershaft and the axle.

Accompanying illustrations show the construction used. The countershafts are supported by pedestals at either end; bronze bushings serve as bearings. These were originally armature bearings from Westinghouse type 307 motors. The countershafts were made out of old axles, which had been discarded for worn journals. The gears are of a split type, which were easily mounted on a countershaft, and a keyway was milled in the shaft and a key installed to prevent turning. Lubrication for the countershaft bearings is provided by Galena oil cups taken from some old motors. The sprocket wheels are shrunk on the countershaft. It was necessary to bore these out to provide a larger diameter for the fit, and as the wall of the hub was quite thin, steel bands were shrunk over the outside ends of the hub so as to eliminate the danger of breakage when the sprocket wheels were forced into position.

The nose suspensions for the motors were constructed of 1-in. x 6-in. soft steel. Cross-members which provided the support for the motor were bolted to uprights,



A Special Motor Car with Motors Mounted Above the Floor Hauls a High Platform Trailer

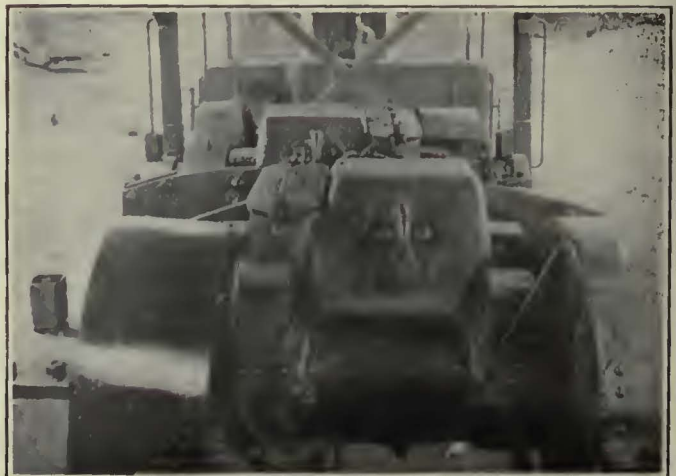
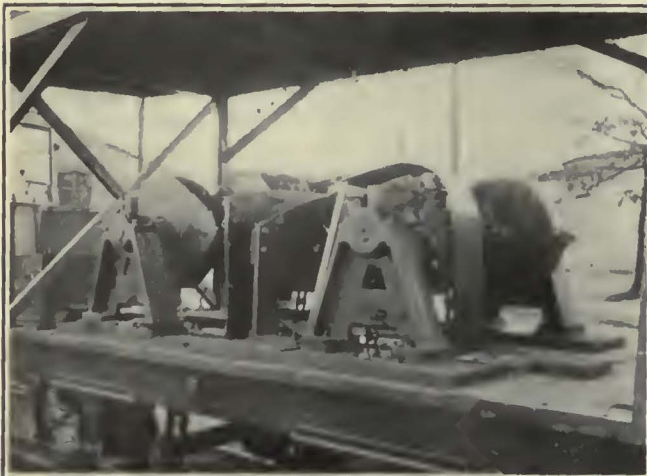
which in turn were bolted directly to planking above the floor. The resistors used in the motor circuit were placed at one end of the car above the floor level and were housed in a wooden box lined with transite. This box was perforated to allow the heat to escape. Protection was also provided over the sprocket wheels. This consisted of a sheet-iron guard, one end of which was bolted to the floor planking, while the other was connected to an angle fastened to the pedestals. The standard gear cases for the motors were used as a housing for the gearing.

The length of the motor car is 22 ft. 4 $\frac{1}{2}$  in. over all and the roof construction consists of 2-in. x 1-in. rafters resting on  $\frac{3}{4}$ -in. x 8-in. boards around the edge. The roofing consists of  $\frac{3}{8}$ -in. white pine roof boards covered with 8-oz. canvas duck. The cross braces and end braces were installed to reinforce perpendiculars for supporting the canopy which were a part of the original construction. Two tarpaulin curtains 13 ft. 3 in. x 5 ft. 4 in. are provided for the sides. These roll up behind the letterboard. No curtains are used at the ends as they would obstruct the view of the motorman while observing passengers boarding and

alighting from the trailer. The original draft rigging was reinforced so as to make certain that breakage would not occur, and as a further safety precaution a  $\frac{3}{4}$ -in. straight-link chain connects the motor car and trailer.

The trailer selected for this service has 33-in. wheels and double steps so that a high floor level is obtained. Cross and longitudinal seating is provided, which gives a seating capacity for 44 passengers. The trailer is 43 ft. 3 in. over all and has two Brill 27-FE trucks. The regular heating and lighting equipments of the trailer are used and connections are furnished through jumpers with receptacles from the motor car. A single five-light circuit lights the motor car.

This emergency ferry car and trailer is kept at a carhouse convenient to the flooded section, and as soon as inspectors report the water as rising so as to be dangerous to usual operation the emergency equipment is placed in service. The crew consists of a motorman for the motor car and a conductor for the trailer. In usual operation the passengers transfer directly from the ordinary cars to the emergency equipment, but where a delay occurs, emergency transfers are issued.



At Left—Standard Railway Motors Are Geared to a Countershaft. The Drive to the Axle Is by Link Chain and Sprockets. At Right—The Sprockets and Link Chain Drives Are Covered with a Sheet-Iron Housing

# Java Starts Electric Trunk Line

Water Power Is Abundant and Coal Is Scarce—First Electrified Division of Dutch East Indies States' Railways Begins Operation on 50th Anniversary of the Day When Funds Were First Voted for Present Steam System

By C. F. Balsem

Railway Staff Dutch East Indies States' Railways,  
Bandoeng, Java



This is a 1,500-Volt Express Train Locomotive Built in Switzerland for the Java Electrified States' Railways

ON APRIL 6, 1925, the first section of the electrified States' Railways in the island of Java was opened with ceremonies and in the presence of a large number of the highest officials and the most prominent business men of Java. The day selected for the event was notable for other reasons than for the ceremony because it was the fiftieth anniversary of the day on which the first funds for starting railway building in Java were granted by the Dutch Legislative Council.

The idea of electrifying the Java States' Railways is not new. Years ago plans were drafted for extended electrification because of the excellent results obtained by the electrified sections of various steam railroads in Europe and in the United States. More than any other, probably, the success attained by the first trunk line electrification in Holland, from Rotterdam to The Hague, was urged as a reason for similar action in Java.

At the request of Ch. Engr. van Stipriaan Luisius, managing director of the Java States' Railways, the chief of the western division of those railways, Engr. Damme, visited England, France and other countries in 1911 to study the latest developments in railway electrification. The result of this study was embodied in a voluminous report, warmly recommending railway electrification in Java.

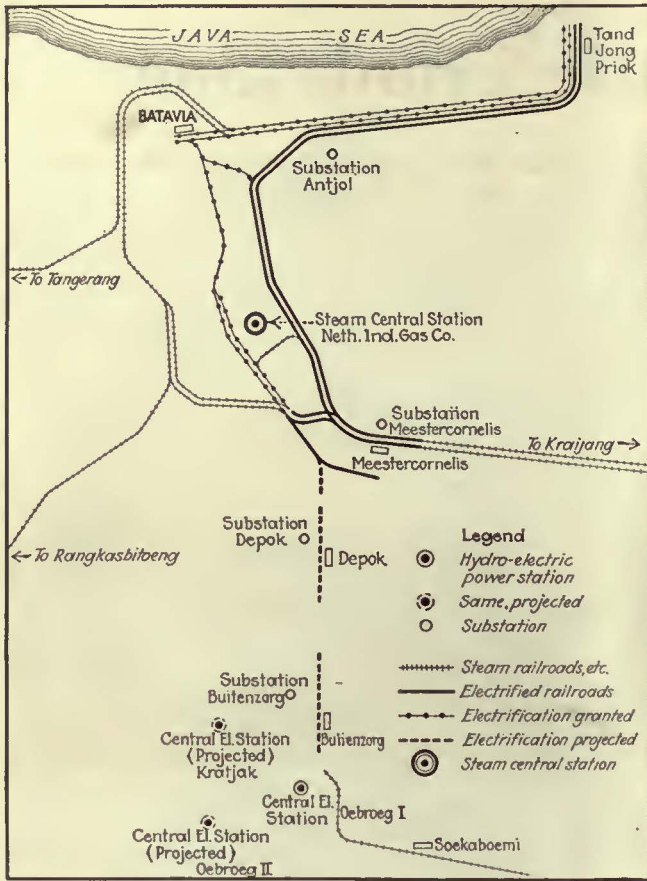
The high costs of construction during the following years delayed the realization of Mr. Damme's recommendation. The development in 1916 on the Chicago, Milwaukee & St. Paul Railroad of high-tension d.c. distribution gave another impetus to the Java project. The great war also emphasized the desirability of electric

traction, because of the scarcity of coal during those years. At that time the price of fuel went to very high figures, and the return of coal prices to pre-war standards seems very distant, if it should ever come. This experience proved the need, in the opinion of the Java railway authorities, of an absolute independence of every country in the matter of fuel for overland transport, especially in a dominion so far from its mother country as is Java.

## WATER POWERS ABUNDANT

Fortunately, the island is rich in water powers whose hydro-electric possibilities were again studied. The opportunity with electric power of greatly reducing the number of employees per ton-mile run was also an important consideration. In consequence, in 1915 the former plans were again taken seriously in hand.

Engr. P. A. Roelofsen, now director of the department of government's industries in the Dutch East Indies, but then chief of the water-power division of that department, realized that the hydro-electric development for railway work should be part of a comprehensive plan for general power generation and distribution. By combining the needs of power in industry and in railway service it would be possible, in his opinion, to justify development which otherwise might have to wait many years for fruition. For this reason Mr. Roelofsen proposed in his report of 1917 a power development plan which would supply the industrial demand for electric power in the province of Batavia, and would also furnish the power required to operate the railways in and around the city of Batavia, the railway from Batavia



Map Showing Electrified Division About Batavia, Java States' Railways

to Buitenzorg, the Governor-General's residence in the mountains of Java, and the lines to Soekaboemi and Tjikampek. The necessary electric power for this plan was to be obtained from two hydro-electric plants.

These proposals were accepted by the government of the Dutch East Indies and approved by the home government. The construction of the two water-power plants was started in 1919 and the following year the States'

Railways began the work of electrification. During the latter part of 1920 the railway part of the work was put under the direction of Dr. Eng. G. de Gelder, who had been sent out from Holland for that purpose.

The necessary energy was to be produced by two powerful hydro-electric plants, located on the Tjitjatih and Tjianten Rivers. The alternating current at 70,000 volts, obtained in those plants, was to be transmitted to the States' Railways' substations at Buitenzorg, Depok, Meester Cornelis and Antjol, there to be transformed to 6,000 volts a.c. At this voltage it was to be delivered to the States' Railways and to the substations for distribution to consumers of electric power and light.

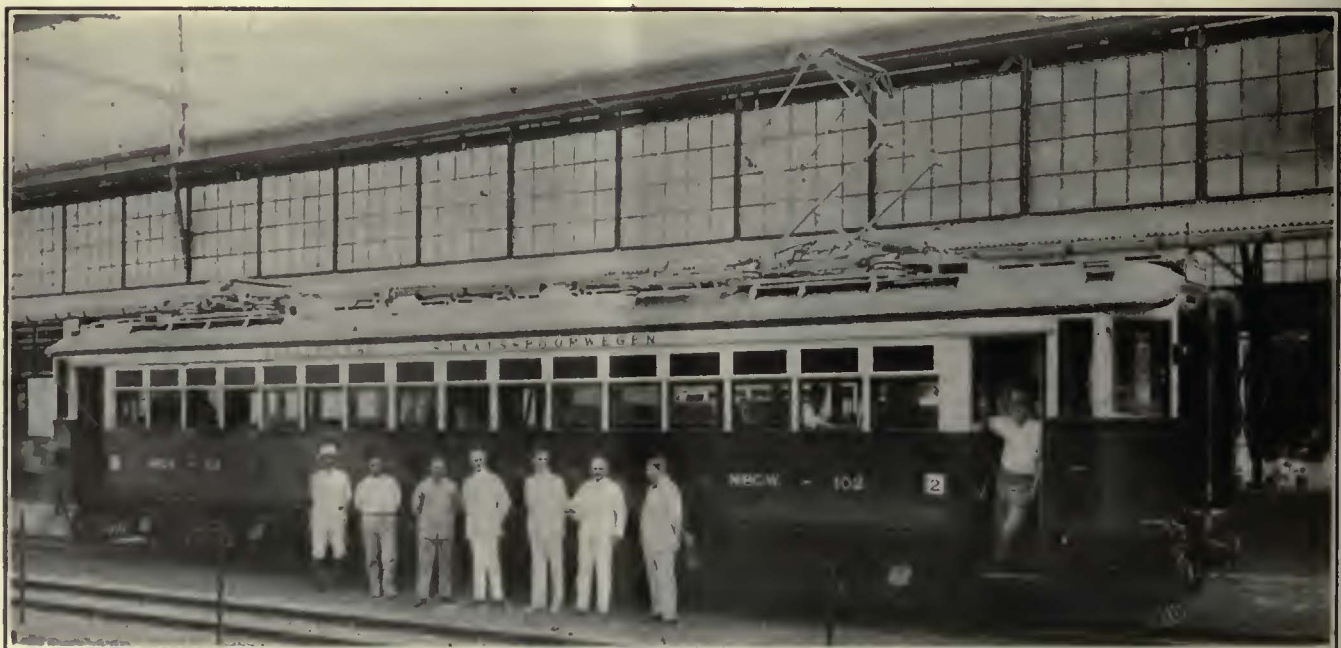
The water-power division was made responsible for the construction and operation of both the hydro-electric plants and the transmission line. The construction and management of the other parts of the equipment, such as the substations and of the electrification of the railway itself, were to be in charge of the electrification division of the States' Railways.

CHANGE IN PLANS NECESSARY

In 1921 all these plans were determined and construction had been begun, when the beginning of the general post-war financial slump compelled a change in the undertaking, and the Dutch government ordered a cessation of further construction. In consequence, the building of the central electric station on the Tjianten River, now called Kratjak station, was temporarily stopped. At the same time the electrification of the railway to Buitenzorg was postponed and the work on the rest of the electrical development in and around Batavia was slowed down.

These measures caused the postponement of the date of completing the first electrified section from the early part of 1923 to the end of 1924.

Under the changed plan the construction of Depok and Buitenzorg substations was temporarily abandoned, but the substations at Meester Cornelis and Antjol were already practically finished. The former substation has a capacity of 3,000 kw. in 1,500-kw. units, and the latter of 4,500 kw. in 1,500-kw. units, to transform the 6,000



This is a Passenger Motor Car, Java States' Railways. The Second-Class Compartment is at One End and the Third-Class at the Other



This Station Looks as if It Might Be in the Occident. Actually It Is at Pasarsenen on the Java States' Railways

volts a.c. to 1,500 volts d.c. This system was chosen as the most desirable for the States' Railways system. The Meester Cornelis substation was finished in September, 1924, and began operation on Dec. 3. Antjol followed in the following January. The equipment for the Meester Cornelis substation was supplied by the General Electric Company of New York and that for the Antjol substation by the Allgemeine Elektrizitäts Gesellschaft of Berlin.

#### CATENARY CONSTRUCTION USED

The overhead contact system of the Meester Cornelis-Tandjong Priok division employs the catenary system with two parallel contact wires of 107 m.m<sup>2</sup> section and a copper catenary cable of 150 m.m<sup>2</sup> section. The Siemens-Schuckert works in Berlin supplied the overhead system complete, with the Enthoven foundry in Delft (Holland) as sub-contractors for the poles, many of which were made in Java.

The length of the electrified Meester Cornelis-Tandjong Priok division consists of 67.7 km. (42.3 miles) measured as single track. The total length of the lines composing the Batavia system amounts to 120 km. (75 miles) in all.

#### ROLLING STOCK

The electrical rolling stock consists of locomotives and motor cars with trailers. The latter supply most of the passenger service between Batavia and its harbor of Tandjong Priok. The standard train consists of one motor car and one trailer. The exception in the passenger service requiring the use of electric locomotives is in the transport of native coolies to and from their work during the rush hours in the early morning and the afternoon. This will be effected by means of trains of several passenger trail cars hauled by locomotives. Electric locomotives will also be used for freight service and to haul the through-express trains from the direc-

tions of Poerwakarta and Buitenzorg to the suburb of Weltevreden and to the city of Batavia, after their arrival at Meester Cornelis.

For the Batavia division twenty motor units were considered to be necessary. Ten of them were ordered from the Beynes Railway Carriage Works in Haarlem, Holland, and were electrically equipped by the General Electric Company of New York. The delivery of five other units, installed by the Westinghouse Heemaf Electric Works, was intrusted to the Koninklyke Fabriek van Werktuigen en Spoorwegmateriel at Amsterdam. Five other motor units will be ordered later.

The orders for the seven electric locomotives required were placed as follows:

Two express-train locomotives, type 1B-B1, 1,570-hp. capacity at a one-hour rating; maximum speed, 90 km.p.h., from the Allgemeine Elektrizitäts Gesellschaft in Berlin.

Two express-train locomotives, type 1A-AA-A1 of 1,500-hp. capacity at the one-hour rating from Brown, Boveri & Company in Baden, Switzerland.

Two passenger and freight locomotives of 1,200-hp. capacity at the one-hour rating and maximum speed of 60 km.p.h., from the Werkspoor-Westinghouse-Heemaf Company in Holland.

One freight locomotive, type AA-AA, 900-hp. capacity and maximum speed of 60 km.p.h., from the Allgemeine Elektrizitäts Gesellschaft in Berlin.

An order has also been placed for two accumulator switching locomotives with the Werkspoor Siemens-Schuckert Company. These locomotives will be of 360-hp. capacity with a maximum speed of 20 m.p.h.

#### FARES CHARGED

A zone-fare system is used on the Batavia Electric Railway. The total length of the line, 15.6 km. (9.75 miles), has been divided in three zones and the fares, expressed in American money, are as follows:

For the first zone, first class, 10 cents; second class, 6 cents, and third class (natives), 3 cents.

For two zones, first class, 18 cents; second class, 12 cents, and third class (natives), 6 cents.

For three zones, first class, 24 cents; second class, 16 cents, and third class (natives), 8 cents.

Special trains to carry the mail are run once a week on the dates of mail boats leaving Tandjong Priok harbor for Europe.

#### MANY NATIVES AMONG EMPLOYEES

The wages of the train and station personnel are rather high as compared with those paid in Europe.

Station masters of European nationality receive as much as \$300 a month in American money. Inspectors and conductors of European nationality receive maximum salaries of \$120 and \$80 respectively in the same time.

Native motormen and locomotive drivers are paid as high as \$70 a month; conductors are paid a maximum of \$28; signal men, \$36; and switchmen, \$13. Besides these payments, a system of premiums for efficient service offers the railway personnel an opportunity for a nice increase in their wages.

As a rule, Europeans are used in the more responsible positions of the staff and natives in those that are less responsible. It should be said, however, that in general the races of the Malay Archipelago, especially those of Java and Sumatra, are easily trained to be good railway men. This is especially true of work in the repair shops where the natives often become very skilled mechanics. Strikes are very rare and never general, and the spirit among the railway men, European as well as native, is generally one of contentment and satisfaction.

### Reading Railroad Finds Gas-Electric Car Useful

SINCE being placed in service some time ago on the Trenton branch of the Reading Railroad a gas-electric car has been run approximately 16,000 miles. It gives frequent service between Trenton and Trenton Junction, the main line connection with New York-Philadelphia trains. The total run is 3.7 miles. The service is unusually severe as four station stops are made and operation at times is with a standard trailer. Grades are as steep as 1.1 per cent, but no auxiliary power unit is needed at any time.

Average schedule time for the one-way trip is ten minutes. Layovers at each terminal are from four to ten minutes in duration, giving a minimum round trip of 24 minutes. Without layovers the average schedule speed is 22 m.p.h. A total of 21 round trips is made on weekdays and 23 on Saturdays, giving an average daily mileage of 170. A 110,000-lb. standard steel coach is handled on three of the round trips. This car also handles the switching of express cars at Trenton and the transferring of one 73-ton express car from Trenton to a main line train at the junction.

This gas-electric car has replaced two class Q-1, 2-6-4 type steam locomotives and one coach. The locomotives were of special design for operation in either direction and in normal service ran around the cars, as the layover time at each terminal was inadequate for turning on a wye. For normal operation of the car no extra movement is necessary as the control is arranged for operation from the rear end and unless a trailer is

hauled the operator can run the car from the rear end.

The motive power equipment of the car consists of a gasoline-engine-driven generator, two motors and control apparatus. The engine has a 7½-in. bore and 8-in. stroke and delivers 250 hp. at 1,100 r.p.m. The generator is of a type designed especially for gas-electric cars and supplies power to two 140-hp., 600-volt d.c. motors located on the forward truck of the car. Motors are axle hung and drive through strong solid helical gears, having as 16:61 ratio, which are totally inclosed and run in grease. This large gear reduction was used to give the high tractive effort necessary with trailer operation. Speeds up to 51 m.p.h. have been attained.

## The Readers' Forum

### *The Noise Reduction Committee's Position*

DEPARTMENT OF STREET RAILWAYS

DETROIT, MICH., Jan. 27, 1926.

To the Editor:

In the Jan. 23 issue of *ELECTRIC RAILWAY JOURNAL* "Master Mechanic" criticises the work of the noise reduction committee and administers a dose of cold water to the new committee which is to study means of improving appearance and comfort of cars.

While it is true that the report of the noise committee did not stir up much discussion on the floor of the convention, yet that is not conclusive proof that the committee's work was futile. As chairman of that committee I have received several letters from railway officials making further inquiry and indicating that they are giving deep study to the subject. Several roads are experimenting along the lines suggested in the report. On one road, to my personal knowledge, something like \$15,000 has been spent during the past four months to overcome noisy conditions in car equipment. This shows conclusively that noise reduction is a very live problem.

Your correspondent speaks of "theorizing" by the committee. In defense of the committee's work I would like to call attention to the fact that its work and report had to be completed between January and June, or in a period of less than six months. Inasmuch as the committeemen must of necessity superimpose this work on their other labors, they cannot hope to prosecute the task as diligently as though they were free to confine themselves to the one subject. It was felt by the members that if they could present to the association a comprehensive study of the underlying principles of the problem and a summary of all known causes with their possible remedies a good foundation would be laid for further work. It is believed that our report did accomplish that purpose, and that while many of the remedies remain to be proved, there are others that are too obvious to require proof. It is the intent of the committee to conduct research work during the present season so that it may submit in its next report definite results free from the taint of "theorizing."

The other question raised—expense—is one that is being given considerable attention. There are several aspects to this phase. In the first place what will it cost? Unfortunately that cannot be definitely settled, as conditions vary so greatly on different properties. It is the consensus of opinion, however, that whatever

steps are necessary to reduce noise in car equipment, it will call for some initial investment, but ultimately the maintenance costs will be reduced due to the use of higher standards. Secondly, quiet cars have a better sales value, and if car riders are to be won back to the electric lines this becomes a very tangible asset.

The committee hopes to supply the Aladdin's lamp. It will be in the form of facts and figures which will give the equipment man the needed arguments to prove to his manager the results which can be obtained. On the other hand, the equipment man must do his bit. This will consist of application of the findings to his own property and keeping up a continuous barrage of reports until he sells the idea.

H. S. WILLIAMS,  
Chairman Noise Reduction Committee A.E.R.E.A.

### *Small Roads May Create a Large Market for Modern Cars*

BEAVER VALLEY TRACTION COMPANY  
NEW BRIGHTON, PA., Jan. 23, 1926.

To the Editor:

Your issue of Jan. 16 was of particular interest to me, having just returned from a meeting of the merchandising transportation committee held in New York. In this number there were five editorials dealing with car equipment. Our committee considers that the car is the show window of our industry.

It is inspiring to note in the recent issues of the JOURNAL the prominence given to the proposition of replacing obsolete electric railway cars.

Recently a small railway company held a meeting of the department heads to discuss specifications of several new cars that were to be purchased. At this conference the question was asked whether it would be possible for the car manufacturers to furnish a unit that would contain comfortable seats and the body so designed that the eye would not be offended with the awkward looks of platform and other equipment. This is just one concrete example of the appreciation of electric railway employees that there is a growing demand for a car unit which will be a better merchandising unit. Undoubtedly the manufacturers will bring out new designs to meet this demand.

A combined purchasing power, perhaps beyond present realization, may be possible among the smaller companies alone when the greater earning power of a modern ride-inviting car is thoroughly demonstrated.

Your recent articles and editorials on this subject certainly have made interesting and inspiring reading.

CLINTON D. SMITH,  
General Manager.

### *Buses Faster than Electric Cars in New York*

NEW YORK, Jan. 25, 1926.

To the Editor:

Some of your readers may get a wrong impression from the short article in your issue of Jan. 9 entitled "Cars Faster than Buses in Test" and believe that as a rule better time is made by street cars in Manhattan Borough, New York, than by the buses of the Fifth Avenue Coach Company. The period selected for the test was between 5 p.m. and 6 p.m. on a single day during December, when Fifth Avenue was crowded with shopping traffic for a large part of the section chosen for the test; i.e., that between Fourteenth Street and 57th Street. It is perhaps only to be expected that buses on Fifth Avenue, when it is crowded with

Christmas shopping traffic, will make slower time than electric cars on Third Avenue, which run on what is almost a reservation in the center of the street, because of the elevated pillars on each side of the car tracks.

That street cars on the average make better speed on Manhattan Island than buses is not correct. One has only to turn to the reports of the New York Transit Commission and determine the vehicle speeds of the different companies, including layovers and delays, by dividing the vehicle-miles by the vehicle-hours. These for the year ended June 30, 1925, show the following for the surface cars: New York Railways, 6.6 m.p.h.; New York & Harlem Railroad, 6.8 m.p.h.; Third Avenue lines below the Harlem River, 6.6 m.p.h. During this period, however, according to the same method of calculation, the buses of the Fifth Avenue Coach Company in Manhattan Borough operated at an average speed of 8.1 m.p.h., or were considerably more than 1 m.p.h. faster than the average for the cars of any of the surface systems mentioned.

TRANSPORTATION.

### **Uniform Signboard Advertising on Main Highways**

By D. H. WALKER

Assistant Engineer Terre Haute, Indianapolis &  
Eastern Traction Company

AT SEVERAL locations along main arterial highways the Terre Haute, Indianapolis & Eastern Traction Company has erected large signboards advertising its service. The majority of these signs have been placed on carhouse or power house property, but some are simply on the right of way at junction points of main highways or near towns. Signs are placed at a sufficient distance from the road to make them clearly visible to passing vehicular traffic. Since all the signs



Typical Advertising Sign of the T. H., I. & E. T. Co. Along the Jackson Highway, Which Runs from Chicago to Florida

are placed on company property they bear no rental charges. In some instances they have been so located that they may be seen from passing interurbans, but the governing factor has been to make them seen by the occupants of passing vehicles. Lighting at night has been tried on some and will soon be installed on all.

Signboards are made 12 ft. high and 30 ft. long with a large diamond emblem of the T. H., I. & E. lines painted in the center. In the four corners are hung boards 2 ft. x 10 ft., which carry the various advertising messages and slogans. The boards are changed at regular intervals and new advertising substituted. All work in connection with erection of signboards and changes of advertising is done by company forces. Messages stress the speed of freight handling and the convenience of fast limited and local passenger services. Pertinent facts concerning the electric railway industry as a whole, and the Middle Western lines particularly, are also placed on the boards.

# Association News & Discussions

## Improvements for All Departments Discussed by New York Association

Papers Were Presented on Painting, the Use of Buses by Electric Railways, Co-operation of All Departments, Safety, Training Future Executives and Economical Practices—Annual Dinner Important Feature of Program

PROVIDING attractive, up-to-date equipment and improving all departments was the keynote of the mid-winter meeting of the New York Electric Railway Association held at the Commodore Hotel, New York City, on Jan. 27. In his opening address President William J. Harvie reviewed the progress that electric railways have made from the horse car days and discussed briefly the coming of the bus into the general scheme of transportation and its rapid advance in use. Attractive, up-to-date equipment designed for comfort rather than luxury was pointed to as a desirable result to be obtained. An abstract of Mr. Harvie's address appears in other columns of this issue.

Present-day practices in car painting were given in a paper by Samuel S. Demarest, abstracted elsewhere in this issue. Following the presentation of the paper Mr. Demarest gave some detailed costs of applying the three systems of painting referred to. These costs substantiate the general statements given in the paper.

E. A. Murphy, general manager United Traction Company, Albany, read a paper entitled "Destroying a Service Which It Cannot Replace." An abstract of the paper appears elsewhere in this issue. Discussing Mr. Murphy's paper, George MacLeod, vice-president and general manager Buffalo & Erie Railway, Fredonia, described the operating and fare collection methods employed by this company. He said that experiments are being made with an auxiliary magnetic brake.

The question was asked whether any of the railway men in the audience knew of an instance where the bus had been successful in handling mass transportation. Mr. Murphy replied that experience in Albany indicated that the bus could not handle mass transportation. He mentioned the desirability of having buses of larger carrying capacity than the 29-passenger vehicle now used in that city, but stated that overhanging trees prevented the use of double-deck buses. Experiments are being made with an eight-wheel bus, he said.

Successful use of a weekly pass on the West Penn Railways as a means of solving the fare collection problem with one-man cars was described by Walter Jackson, consultant, Mount

Vernon. In regard to speed, Mr. Jackson pointed out that the double-deck bus is inherently a slow vehicle.

"Internal Co-operation" was the subject of a paper presented by C. P. Segard, assistant secretary Third Avenue Railway System, New York City. A paper, "Potential Executives in the Rank and File," by R. E. Danforth, formerly vice-president and general manager Public Service Railway, New Jersey, was read by Martin Schreiber, manager southern division Public Service Railway, in the absence of Mr. Danforth. "Points on Which City and Traction Officials Should Agree" was the subject of a paper by W. P. Capes, director New York State Bureau of Municipal Research. No discussion followed the presentation of any of these three papers. Abstracts appear elsewhere in this issue.

Barron G. Collier had been unavoidably detained out of town and was unable to write a paper.

Alfred T. Davison, general counsel Third Avenue Railway System, delivered a talk on accident prevention as practiced by his company.

Education before the accident occurs rather than discipline afterward is the plan on which the recent work of the Third Avenue Railway System has been conducted. For two years this company has filed all of its accidents on the seven-point system. The record of each accident is written with six carbon copies, which with the original make seven, and these copies are filed under the seven different classifications which might serve later to identify them. One record is under the name of the party injured, the second under the address given, third the date, fourth the line on which it occurred, fifth the car number involved in the accident, sixth the motorman involved, and seventh the conductor involved. Periodically a statement is made up showing the location of all accidents.

An analysis of the accidents shows that in 25 per cent of the accidents the company was at fault, and in 75 per cent the company was not at fault. The efforts of the company are directed toward reducing the 25 per cent of accidents at fault, and attempting to prevent recurrence of accidents falling in the 75 per cent class, and at the same time educating the operating department so that the claim department

will have sufficient witnesses and other data that will aid in preventing payment of money if the cases come to court.

The company often pays large sums of money in settlement of accident claims falling in the 75 per cent not-at-fault class, because proper witnesses were not obtained, and trainmen are impressed that they are responsible not only to reduce accidents but to protect their company in connection with all accidents whether they are in fault or not. The company is also trying to impress trainmen that often serious accidents may result from apparently trivial things. A car that is allowed to roll only a few inches after the doors are opened may cause a serious accident to a feeble person who may be boarding or alighting.

The latest effort of the company to analyze accidents was started in November. Due to this work the serious accidents have been materially reduced. For the three months August, September and October of last year the serious accidents on this system averaged 1,719, whereas for November and December they averaged 1,632.

An interesting point used to prevail upon the trainmen and operating forces is that the company is now paying out twice as much money for accidents as it did ten years ago, and that the same care applied now as ten years ago would save from two to three times the amount of money.

Following Mr. Davison's talk, the question was asked from the floor as to how the company informed the men relative to the statistics of accidents, to which Mr. Davison replied that the road instructors, road men and superintendents must attend the weekly conferences, when they and others analyze the accidents. These officials then take up the analysis with the trainmen, and in this way carry much information directly to the trainmen.

To the question asked by President Harvie as to what effect this work is having on the 75 per cent of accidents not at fault, Mr. Davison answered that this could not be determined for perhaps a year, as it took at least this amount of time finally to dispose of cases that may be brought to trial. The answer would be the amount of money the company had to pay out in the settlements as compared to years prior to this work.

Charles H. Clark, engineer in charge of maintenance of way Cleveland Railway, then presented seven reels of moving pictures which illustrated many features of interest in the operation of his company. First his audience was permitted to take a ride down Euclid Avenue on the top of one of the Cleveland Railway's six-wheel double-deck buses. Surviving this experience safely,



they then were conducted through the extensive maintenance and production shops, where many of the labor-saving devices developed by the engineers of the company were in operation.

A trip to various sections of the right-of-way was included in order to illustrate the methods employed in track and pavement construction and in general roadbed maintenance.

Several of the reels were prepared specially for showing at this meeting, while others were taken previously. Following the showing of the pictures, President Harvie declared the business session adjourned.

The dinner meeting, scheduled for 6:30 convened shortly after, and was eminently successful. Edward F.

Wickwire, vice-president of the Ohio Brass Company, Mansfield, Ohio, talked on "The Jolly Trolleying Public." The paper was filled with similes presented in the inimitable style for which Mr. Wickwire has become famous.

John A. Ritchie, president Yellow Truck & Coach Manufacturing Company, followed with a paper on "The Place of the Motor Bus in Co-ordinated Urban Transportation." Abstracts of both of these papers appear elsewhere.

The dinner was interspersed with good entertaining features and closed with a talk by Strickland Gillian, a humorist of note.

During the day the meetings were well attended and 437 members and guests attended the dinner.

We are then once more facing a new condition; not a complete transition from one form of transportation to another form, as before, but a partial transition and a revamping of our methods, so that by the addition of the bus we may furnish a more complete and more extensive transportation service than was possible before.

Our danger is that some of us may feel that we are facing a complete transition in existing transportation facilities and the consequent general disappearance of electric cars, and, indeed, some of our citizens do think so. I do not share this thought, for as long as large numbers of people desire to be transported by a public conveyance from place to place at about the same time, or continuously for a period, the electric car will be the most expeditious method by which it may be accomplished.

The fundamental need of the traveling public is the same today as it always was, although we are inclined to lose sight of that fact when we view around us the increasing tendency of our public to provide its own individual transportation service. This method we know to be the most expensive for the individual, and, from the community standpoint, most uneconomical of street space.

What is the type of equipment with which to attract patronage? It seems to me that the equipment should be what may be described as comfortable, not luxurious. So-called de luxe equipment is quite another matter, and rightfully calls for an extra charge. The question of size of units and headways should fit the needs of the public which is to be served. The equipment selected must, of course, be adaptable to highly economical operation. These considerations are of prime importance and are of equal force whether applied to electric street cars, buses or other means of public transportation.

Present-day conditions make it necessary for us to take stock of ourselves and our industry and, having in mind the fundamental needs, adapt our equipment and methods to present-day ideas of good service.

Let us not imagine that supplying plush seats with double cushions and putting tapestry curtains at the windows will suffice to increase permanently our present patronage or to win back lost customers. The average user of the electric railway does not seriously care for such refinements. If he can ride in reasonable comfort and reach his destination quickly he will be quite satisfied that he has full value for his fare. Neither do I think the average citizen cares what colors or decorations we use on our cars or buses so long as they do not offend the eye.

Consider your investments in equipment in the light of common sense and good judgment. Meet changing conditions with the right perspective. Do not permit good judgment to be warped by the present tendency to furnish de luxe service where only plebeian returns are possible, nor go to the other extreme of furnishing less than a comfortable ride to your passengers for economic reasons, and then expect your public to give you its support.

## What Type of Equipment Will Attract Patronage?\*

By W. J. HARVIE

Vice-President and General Manager Auburn & Syracuse Electric Railroad

**D**URING the time this association has been in existence we have witnessed many new developments in transportation methods. We are witnessing other developments in the methods used in public transportation, and we must not close our eyes to new requirements, both actual and fancied, as they present themselves.

Fundamental during all this time have been two thoughts, attractive, up-to-date equipment and economical operation. Great progress has been made along both of these lines in so far as those factors were concerned over which we had control. We have undertaken to meet changing conditions as they arose and as new needs and habits became apparent.

Many of you will recall a time some years ago when our sole idea seemed to be to operate electric cars which in the light of later experience were far too heavy. Within a period more recent we were installing on our lines the very lightest possible equipment, and were listening to debates regarding the cost per annum of carrying the weight of the paint which we applied to our light equipment; certainly an amazing example of going from one extreme to the other. Neither type of equipment was satisfactory; both were the result of a sincere effort on the part of railway operators and investors to furnish, in the first instance, what was then termed attractive, and even luxurious, equipment for the use of our public, and in the latter instance an effort to furnish attractive, though not luxurious, service, the main object being to reduce to the lowest figure the cost of furnishing that service. Both of these efforts were commendatory, but, in the light of experience, both went too far.

Some time just prior to 1922 a new form of transportation, the motor bus, began to make itself known. Its presence was not seriously noticed at first, but our public received it well, and it soon began to gain in popular favor.

Its influence on our industry was not great, for in 1922 the bus carried but one-tenth of 1 per cent of the number of passengers carried on the electric cars. However, this small percentage amounted to more than sixteen million persons, and, as you know, the number has been increasing since that time.

### COMING MEETINGS

OF

### *Electric Railway and Allied Associations*

*Feb. 4*—New England Street Railway Club, Copley Plaza Hotel, Boston, Mass.

*Feb. 5*—Metropolitan Section, American Electric Railway Association, Engineering Societies Building, 29 West 39th Street, New York, N. Y., 8 p.m.

*Feb. 8-11*—American Institute of Electrical Engineers, midwinter convention, 29 West 39th Street, New York, N. Y.

*Feb. 11*—Central Electric Railway Master Mechanics' Association, Portage Hotel, Akron, Ohio.

*Feb. 18*—A. S. C. E., A. S. M. E., A. I. E. E. and A. I. M. M. E., joint meeting, Engineering Societies Building, New York, N. Y., 8-15 p.m.

*Feb. 24-26*—Electric Railway Association of Equipment Men, Southern Properties, Mobile, Ala.

*March 8-11*—National Railway Appliance Association, annual exhibition, Coliseum and Annex, Chicago, Ill.

*March 9-11*—Oklahoma Utilities Association, annual convention, Mayo Hotel, Tulsa Okla.

*March 17-18*—Illinois Electric Railway Association, Illinois State Electric Association and Illinois Gas Association, annual joint convention, Springfield, Ill.

*April 13-16*—Southwestern Public Service Association, Galveston, Tex.

\*Abstract of paper delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

## Present-Day Car Painting\*

By SAMUEL S. DEMAREST  
Pratt & Lambert Company

FOR exterior car painting, be the surface wood or metal, there are three standard methods of application in vogue today. The first operation in car finishing or painting, after thoroughly cleaning the surfaces to be decorated, is priming. The priming coat may be applied by brush or spray and the material or primer used may be clear or it may contain pigment. In any event, whatever form of primer is used, on wooden surfaces it should be well worked into the surface. Many painters insist on white lead and oil for priming over wood; this practice is sound but not essential, for there are many long oil primers on the market today which insure equally efficient returns. Primers for use over metal surfaces, in the estimation of many authorities, should contain certain rust preventing or retarding properties; that is, be made up with admixtures of pigments such as red lead, blue lead or red oxide of iron; again, satisfactory results are shown where clear primers are used directly over the metal. Primers provide the base upon which the succeeding coats depend. They must of necessity be long in oil in order to give the maximum of adhesion and provide proper elasticity.

Surfacing coats follow the priming operation. They provide a workability for sanding or rubbing, which creates a smooth, flawless base, ready for the finish coats. Surfacing are supplied in knifing and brushing consistencies. Knifing coats, which fill and hide all minute indentations or abrasions of the wood or metal, are applied with a putty knife. Brush-coating surfacer may be applied by brushing or spraying. There are no fixed rules as to the number of surfacing coats required; this depends solely upon the condition of the surface being treated and the fineness of the ultimate finish desired. Surfacing in their make-up should be short enough to insure being rubbed or sanded smooth without arduous labor and yet long enough in oil to prevent absorption of color coats and to allow for the contractive and expansive action in metal car bodies without disintegrating. All large holes or depressions in wooden or steel bodies are filled with putty or some kindred product in between the surfacing coats.

When flat colors, known as colors in Japan; car body coatings or enamels are used directly over the surfacing coats in order to obtain certain color schemes and these are followed by varnish coats, the plan of finish is known as the color and varnish system. This generally consists of one or two coats of color body applied directly over the smoothly rubbed or sanded surfacer, followed by one coat of rubbing varnish and one or more coats of finishing varnish.

Where one or more coats of long oil enamel follow the surfacing operations the system is known as an enamel system. The lacquer enamel system con-

sists of the spray application of two or more coats of lacquer into which color pigments have been incorporated, over especially adapted primers and surfacers applied as above.

Due primarily to savings in labor costs, accounted for by its demands for a minimum number of coats, the enamel system represents the most economical method of exterior car finishing in use today. The color and varnish system stands second in this comparison and is about midway between the enamel and the lacquer enamel systems, the latter of which is the most expensive on original application. Many manufacturers feel the time is not far distant when increased production of lacquer enamels will bring the costs of these materials down to a level where the lacquer enamel system will prove the most economical from an original application standpoint of view.

Expressions as to time required for car shopping for painting vary slightly. The lacquer enamel system in our estimation now provides the fastest schedule of car finishing and this schedule will doubtless be reduced as new products going into the make-up of the system are developed and application methods for the materials themselves are perfected. The enamel system follows closely the lacquer enamel system in this connection, the color and varnish system standing last.

For sheer downright beauty and appearance of finish the color and varnish system, for a time, undoubtedly excels other systems in the sight of the most exacting. The high luster imparted to car bodies through the final coats of good finishing varnishes bespeaks a newness and cleanliness appealing to many operating officials. Comparative ease of cleaning and weathering, however, soon dim this first high luster and the sheen of the finish continues to go backward throughout the life of the job.

Several manufacturers of enamels have more recently incorporated into their products a luster which enables them to give a finish in their enamel systems vying closely with that obtained through the use of the color and varnish system. In the instance of the enamel system the luster of the final coatings recedes very slowly, and in a relatively short time, under identical conditions, the sheen of the finish secured through the use of the enamel system surpasses that given by the color and varnish system. The enamel system presents a surface readily cleanable if the proper cleaning compounds are used. The lacquer system now offers, in appearance, what is known as an eggshell finish. Surfaces to which lacquer enamels have been applied are, in most cases, easily cleaned with practically any form of cleaner and the finish itself picks up added luster through continued washing.

The color and varnish system lends itself readily to the various forms of striping, lettering and numbering, and especially is this so where that work is

done in gold or aluminum leaf. Gold and aluminum leaf must be varnished, if only pencil varnished, for protection against the elements, all of which means extra operations where the enamel or lacquer enamel system is used. To offset this feature imitation gold and aluminum enamels have been developed for use in striping, lettering and numbering over enamels and lacquer enamels.

Refinishing costs in connection with the various systems of car painting are the issue commonly overlooked by operating officials in selecting a desired type of finish, and yet they represent almost as important a factor to the railway company as does the original combination applied to the car. If cars painted with the color and varnish system are not left on the road too long, they can in many instances be brought back to practically their original appearance through the application of but one coat of finishing varnish; this plan would frequently necessitate taking cars out of service for painting alone instead of refinishing only at the time of general car overhaul.

Where the color and varnish system is allowed to deteriorate too far it is an expensive system to employ from a refinishing point of view. The enamel system can be brought back to its original appearance at the time of car overhaul, through the application of but one coat of enamel directly over the old finish.

On first development, lacquer products bore so much of promise toward that goal of speed and endless service that enthusiastic sales representatives oversold themselves on it and they, in turn, oversold their ideas. Multi-colored cars have in a measure been a stumbling block for lacquer application. Lacquer, thus far, has shown a tendency to serve better on exterior metal surfaces than on wood, its supposed highly inflammable composition leading it to be discarded by some without second thought. Some tried it and in certain instances it failed.

## Destroying a Service Which Cannot Be Replaced\*

By ERNEST MURPHY

General Manager United Traction Company,  
Hudson Valley Railway Company, Capitol  
District Transportation Company,  
Albany, N. Y.

**B**UILDERS of the program for this meeting were almost as generous as the grizzled veteran in the colored congregation. The new minister had asked him to select a text on which he could speak, whereupon he pointed to the sentence, "This is the beginning and the ending."

Taking for granted the bare, broad statement that the automobile and the automobile riders have cut enormously into the earnings of the street railway companies, causing in many instances lines to be operated at a constantly increasing loss, the question naturally arises: When is the automobile used for pleasure and when is it used for business? Is it used for business when

\*Abstract of paper delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

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the owner rides to work in the morning, picking up a number of friends who might be prospective street car passengers and then leaves his car parked all day to obstruct normal traffic, so that it must move in a 16-ft. lane left between parked cars? The delays caused by traffic congestion in city streets due to parking is a problem felt by every operator in cities large and small.

Our own experience has been to review completely the several lines as to earnings, expenses and reconstruction costs, and where the reconstruction costs were such that the operating revenue did not warrant a reproduction in kind of the structures, the trolley lines were abandoned and buses substituted. Since the installation of our first bus operation, experience has proved that the buses hold the passenger traffic and in some instances apparently induced additional traffic over the lines.

Use of the double-deck bus in Albany was practically prohibited by overhanging trees, so that the 29-passenger

single type was adopted. However, on certain lines it would be desirable to have a vehicle with a larger capacity for operation during the morning and evening peak loads.

The popularity of buses over the trolley cars is quite evident. The traveling public seems to be better pleased with riding on rubber wheels than on steel wheels and rails. There is no question about the fact that transportation by bus is quicker, and the people get to and from their work in less time than they did by the trolley lines which have been abandoned. It is unquestionably safer, because of the manner of boarding and alighting from buses as compared with the trolley car. The operation cannot be suspended by obstructions on the street.

The people today would not go back to the old sailing vessel for transportation; nor to the horse car. With care exercised by a railway management as to lines which could better be operated by the substitution of bus transportation, our experience tells us that such substitution is justifiable.

## Internal Co-operation\*

By CHRISTIAN P. SEGARD, M.D.

Assistant Secretary Third Avenue Railway, New York

MANY of the lessons that we wish to mark indelibly on the juvenile mind of today are learned, not in the schoolroom, but on the play field. Perhaps the most important rule of all games in which more than one individual takes part is the unwritten law of team work. And team work of whatever kind, whether in games or in industry, requires as its counterpart, knowledge. The word co-operation might be substituted for team work.

Let us examine some of the causative factors of non-co-operation.

1. A lack of knowledge of the whole and the purpose of its parts leads to non-co-operation. The man whose job is fitting a bearing or setting up some bolts can never have the same interest in the completed product as the man who in former days did almost the entire job and in addition tested the product and saw it work.

2. The highly trained specialist who has devoted all his time to the study of one particular phase of industry naturally shows less interest in industry's other phases. It seems that the specialist has broadened his basic knowledge of one particular phase at the expense of his interest in all other phases. Interest and knowledge of the component parts of industry beget co-operation.

3. Many times the common objective of the whole is replaced by a lesser objective of one of the parts. In our anxiety to excel within a department we may throw a great burden on some other department far outweighing the excellence gained.

4. An unwillingness to accept suggestions or information when offered. The least we can do when a suggestion is made or information offered is to

accept it with the same degree of interest that inspired it.

5. And last but not least we have the most interesting if not the most common cause of non-co-operation and that is the characteristics of the human being himself. Human weaknesses such as self-interest, jealousy, fear and intentional non-co-operation should probably head the long list.

### METHODS TO SECURE CO-OPERATION

We can't just talk about co-operation, we must lay down some few methods by which it can be accomplished. The following are ten factors involved in securing co-operation:

1. The common objective of the whole is the most important factor. Unified effort to attain this common objective is essential to growth. No one individual and no one department is of more importance than another. The individual and the department are each an integral part of the whole.

2. Information. How often have we heard the statement, "Why didn't I know this before?" meaning, "why didn't I get information?" Many a good piece of equipment and many a sound proposition has failed because of failure to co-operate with the forces that were directly concerned with making the proposed change an unqualified success.

3. Suggestions whether verbal or written are one of the means by which we understand that the individual is trying to co-operate. Very frequently we find that a suggestion may come from an entirely unexpected source and refer to something entirely outside of the department. Anyone offering any suggestion for the good of the company is entitled to our respect and a hearing. He is showing his willingness to co-operate.

4. To attain co-operation it is neces-

sary that there be mutual respect. Without respect for our associates, superiors and organization, we certainly cannot secure harmony, efficiency or co-operation.

5. If we cannot effect co-operation we may be able to effect compromise. Two departments were using the same expensive material, but of a different quality. The difference was small, yet it was necessary for the storeroom to stock both qualities. One size could have been completely eliminated had these two departments been willing to compromise on one quality which could easily have been used for both jobs. The purchasing agent and storekeeper could frequently show us where a saving could be made if slight differences in size and quality specifications were eliminated.

6. How very often have we found in our own experience that we are very human in our willingness to receive approbation and yet so very unwilling to give our approval to those associated with us. This is a most inconsistent form of human weakness and can only be overcome through conscious effort. Exceptional effort is entitled to commendation just as mistakes require criticism. Commendations need publicity, criticism must be private.

7. Inter-departmental co-operation. How often have any of us gone to another executive or department head and said plainly, so there could be no misunderstanding, "How can my department co-operate with yours?" Unless we ourselves invite co-operation it is unreasonable to expect to receive it.

8. Conferences (of the heads of departments). One of the most abused words in the English language is the word conference as related to a meeting of a group of executives. The reason for this is that the purpose of a conference is information and to determine policy. When we begin to hold conferences to determine method, we are belittling the conference and needlessly consuming time. This, however, does not eliminate group discussion within a department on methods of carrying out a predetermined policy of the whole.

9. Contact. If there is one thing more than another that will beget co-operation it is personal contact. This can be established not only within the department but between departments. Heads of departments see, hear and grasp many points with relation to other departments that would be invaluable if passed on.

10. Programming. The most exact method that can be used by a department head for the securing of a plan for himself that will include his own department is to program the future. By programming is meant the simple process of putting down on paper the tasks for a definite period. Every link whereby the department relates itself to every other department is included in the program. It is an advance record of future co-operation.

There is an oriental saying that "It is just as easy to walk with a man as it is to walk four paces behind him." It is easier to compromise and co-operate with a man than it is to offer obstruction and opposition.

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## Training Potential Executives in the Rank and File\*

By R. E. DANFORTH

Formerly Vice-President and General Manager Public Service Railway, New Jersey

**S**UCCESSFUL continuance of the electric railway as an effective, reliable and economical mode of public transportation depends upon training of potential executives in the rank and file. It is not a new subject. It does not concern a problem peculiar to our industry. History fails to reach far enough back in the ages to mark its origin. It is universal wherever a group of individuals work under a leader, or leaders, to a common end—the perpetuation of authority and ability to control or direct.

If the employing agency has selected for employment men and women of good health, good character, a clean record, fair education, normal intelligence and a good disposition or cheerfulness, we may say safely that given proper supervision and training, able executives may be obtained from the rank and file of the employees. The great difficulty is, however, that the terms of the qualifying clause are often, if not usually, ignored in actual practice, as found upon our electric railways—not to say upon industrial concerns generally. "Given proper supervision and training"—that is where we are weak—where we generally fall down.

Experience alone does not fully equip the individual for an executive position, nor does education, whether technical, legal, scientific or classical. No, nor do the two together, great as their combined values are. Neither does ability to plan and devise ways and means to accomplish any purpose or work. Other qualities are needed today, including the ability to express one's ideas clearly and to get them across to others successfully.

Characteristics which are inborn in the man are of equal importance with those developed through training and experience. Good old-fashioned virtues they are and, praise be, so often found in the rank and file of our own employees. Honesty, loyalty, courage or determination to see a thing through, kindness with its gift for making friends, enthusiasm for the job or the business, vision—eyes and brain that see things as they are and as they should or will be—all compounded into good old horse sense and gumption.

Given the specifications and the raw material, how are we to go about developing the executives of the future? Leave it to George, or to chance? No—of course not. The chief executive of a large system may not know personally all of the thousand or more employees under him. On such a system, however, there are other executives who can and should know the men in their own departments, and have at hand the personal records of many, if not of all of them. It is someone's business to know, and that indi-

vidual is under a heavy obligation to his company and to its employees to see to it, first, that each employee does well his particular task; second, to see that he is properly fitted for advancement when opportunity offers, and third, to see that individual records show the good points of each employee and that such record is in due time made known to the executive who selects individuals for promotion.

Managerial timber is to be found in nearly every organization of average size. The problem is to find and develop it for use. The minor supervisory positions are usually filled from the workers in the particular department involved, and the selection is often too haphazard. Knowledge of the work and practice of other departments is valuable to those who are suitable for continued advancement. Opportunity to gain such knowledge should be given to the more able and progressive of the organization.

I advocate the systematic training of promising young men for executive positions—young men selected for the purpose when hired, or soon thereafter. Where possible, high school graduates should be shifted from department to department systematically during the first year or two of employment, in order to give them a general working knowledge of and sympathy with the methods and problems of each. These young men may then be placed in the ranks of any department and be per-

mitted to grow up there until age, experience, evident ability to progress and personal records show them ready for promotion. I would call such young men "apprentices."

Others who have had a college education may be put through a "cadet engineer's course. After completing this with satisfaction they may be placed in some minor supervisory position or used as executive clerks to the general manager, superintendent or head of department, or be placed on the engineering staff, to be later transferred and used as occasion warrants. Many men now in positions of high responsibility were so trained.

We may often make mistakes in selecting these young men for apprentices or cadets. We may later find them not suited for the railway business. Therefore, the weeding out process, based upon a more intimate knowledge of the young man's ability and his probable fitness for railway executive work, is necessary. Let the weeding begin soon—but not too soon. Some develop slowly. Some have to unlearn many things before their true worth is made evident.

Look within your organization for men capable of being trained to carry on, and spare no effort to develop within the organization's ranks: Esprit de corps, knowledge of how to serve the public, the habit of courtesy, of economy and of willingness—of eagerness to learn new ways and up-to-date methods of operation and of service, and the fixed idea all up and down the line that an official's prime duty is promptly to train, develop and have ready at hand a fit man to take over his job when he himself steps up—or out.

## Points on Which Traction and City Officials Should Agree\*

By WILLIAM PAW CAPES

Director New York State Bureau of Municipal Research

**C**ITIES are in a quandary as to the correct solution of the transportation problem and proper regulations for existing services. We are in a period of evolution so far as urban and interurban transportation is concerned. Is the continuance of the street railway a public necessity in all or some communities or in none? Is the motor bus an essential utility in all or some communities? If so, should it supplant the trolley car? Should it be permitted to compete with the street railway? Should it be used as a feeder for the street railway? Will the trackless trolley help to solve the transportation problem? Will science develop some new and more economical methods of transporting people? If buses are an essential utility, who shall the city permit to operate them? What regulations should be made for bus transportation. With street railways being rapidly relieved of the essentials of monopoly which they heretofore enjoyed, should regulation of their rates and services be made less severe? These are only a few of the many questions vital to transportation of the

future to which the cities are seeking the correct answer.

Urban and interurban transportation is more flexible and less monopolistic than ever before. Even climatic conditions affect the degree of flexibility and monopoly. The private automobile has made transportation of human beings almost a seasonal occupation. The resulting complicated situation is appreciated by the public official.

Nevertheless the public wants transportation service, efficient and economical, at any time it sees fit to use it. The prosperity of the community requires such a service. The public holds its public servants responsible either for providing it or insisting that it be provided. The public officials are, therefore, thinking hard and acting cautiously. Officials of the transportation company are in about the same uncomfortable and complex situation. Therefore, the two first points on which public and company officials should agree

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are those of establishing confidence and co-operating to seek correct answers to the many questions that are vital to the interest of those they represent.

There are two other points on which public and street railway officials should agree. The first relates to the provisions of law in respect to pavements which railway companies must construct and maintain. Most of the cities and all of the traction companies agree that the present law should be modified to permit a greater flexibility in determining for how much paving area the company should be held responsible. The present provisions are too rigid. No general law, however comprehensive, may satisfactorily completely and fairly take care of paving charges either in all municipalities or even in a single municipality. Different localities present different requirements as to the paving area.

The only way to avoid litigation, misunderstanding and bickerings is by fixing a definite area for which traction companies would be held accountable. The extent of this area will vary as previously indicated. I, therefore, present for your serious, and I hope favorable, consideration the suggestion that the present law be amended so as to provide that surface railway companies shall be compelled to construct and maintain pavements contiguous to their tracks, the area to be determined by ordinance of the local legislative body upon the recommendation of the city engineer; provided that such amendment will not permit a greater area than that now prescribed by law and will in no way abrogate or change any franchise provision or contract now in force in respect to paving.

All of the proposals which representatives of the traction companies have submitted make the corporations responsible for pavements damaged by the existence of the tracks in the streets, such damages to be determined by the city and the traction company or by the Public Service Commission. The adoption of such a proposition would lead to endless litigation, misunderstanding and bickering which would cost the companies in legal services and good will a large share of the amount they hope to save through a change in the law.

My last point deals with delayed trolley service resulting from traffic congestion due to the parking of motor vehicles. Our studies show that in many cities this is a serious problem. The cities of New York State, through the State Bureau of Municipal Information, have investigated the parking problem and recommended a complete parking program for any city. Those recommendations which will be of particular interest to your association are as follows:

In view of the fact that traffic will continue to increase and that attempts to relieve congestion by parking time limits, traffic diversion and other restrictions do not and cannot satisfactorily and finally care for the interest of the public generally, the merchant or the automobile owner, it seems evident that eventually cities will be forced to prohibit street parking within and adjacent to congested districts, except in unusually wide streets. To put such a regulation into effect at one time and for the entire district, however, would be too drastic a step. It would for a time at least, seriously affect business conditions unless near-by off-street parking places were pro-

vided, and no city at the present time has adequate facilities for the parking and storage of vehicles off-street and conveniently located. For these reasons we believe that cities should undertake a gradual prohibition, as the needs require. They should apply the prohibition first to the most seriously congested thoroughfares and gradually extend the regulation as the pressing needs require and off-street parking facilities will permit.

We believe that in congested districts no parking should be allowed in a street in which street cars operate unless there is room for at least one line of travel, 10 ft. in width, between the street car area and the line of vehicles parked at the curb. This is the very minimum under which parking should be allowed. This will not, however, solve the parking problem, for traffic will be impeded and often interrupted and the fire hazard will be great. Under such conditions, and with parallel parking, the minimum width of roadway should be as follows: streets with a single trolley line, 47-ft. roadway; streets with a double trolley line, 57-ft. roadway.

Traffic will not be seriously affected and fire hazards will be practically eliminated if parking is allowed only in a congested street, the roadway of which will accommodate two lines of moving traffic and one line of parked cars between the street car area and the curb. Under such conditions, and with parallel parking, the minimum width of roadway should be as follows: streets with a single trolley line, 67-ft. roadway; streets with a double trolley line, 77-ft. roadway.

Whether or not parking should be prohibited absolutely or in part in streets

whose widths are greater than those above specified, depends upon traffic conditions. No general recommendation can be made for these.

It needs no argument by me to convince you that if these recommendations were made effective in every municipality, your troubles so far as delays resulting from congestion are concerned would be eliminated. Why are they not adopted? That question brings the discussion on this point to a head.

In approaching the street parking problem, cities must consider the needs and desires of three groups: the public generally, the business man and merchant and the motorist. It is exceedingly difficult, if not almost impossible, to provide regulations that will meet all needs and satisfy all desires.

If you expect the city to regulate parking so as to eliminate trolley car delay, you must give those officials who make and enforce regulation your unstinted moral support. They will need all the help that you and others interested in efficient transportation can give them to prevent selfish interests upsetting their plans and thwarting their efforts.

## Co-ordination of Rail and Automotive Transportation\*

BY JOHN A. RITCHIE

President Yellow Truck & Coach Manufacturing Company

TO MY mind the American Electric Railway Association convention in Atlantic City last October marked a milestone in the advance of co-ordinated electric railway and motor coach transportation. Not only the display of motor coaches at a convention of street railway operators, but more especially the thoughtful, intelligent consideration in a large number of papers on the problems of motor vehicle operation, gave overwhelming evidence of the realization of our common interest as transportation men.

With the adoption of the motor vehicle new problems have arisen, especially the best way to use the motor coach. That brings up the subject of co-ordination.

### THE PUBLIC ITSELF IS A DICTATOR OF TRANSPORTATION

But who is to permit the co-ordination? We have a national dictator of transportation. He is not, however, an individual. This dictator is the public itself. But suppose we had a national officer called the "Dictator of Transportation." What would his first job be? Co-ordination.

He'd find that we have about 300,000 miles of steam and electric railroads, about 70,000 motor coaches, 3,000,000 motor trucks and about 17,000,000 passenger automobiles running over nearly 500,000 miles of improved highways and 2,400,000 miles of highways yet to be improved.

The transportation act of 1920 specifically recognizes this in its terms, something no preceding act had ever

done. In Section 15-a, the so-called rate-making section, it provides that the commission, bearing in mind the necessity of railroad growth, shall permit rates on which the railroads may earn a fair return on their fair value. I do not feel that this has been accomplished—and that is another story—but the will of the people, as expressed by Congress, is in the act.

As to the railroads, at least, it practically repealed the Sherman anti-trust act, and the vigorous sentiment in approval of railroad mergers which are in the public interest is evidence of how far we have traveled. The value of co-ordination in railroad service is now beginning to be appreciated.

The big idea in regulation used to be restriction and preservation or incitement to competition, which often became competition of the cut-throat variety.

### COURTS AND COMMISSIONS APPROVE THE IDEA OF CO-ORDINATION

Both courts and commissions have pointed out the value of co-ordinated service to the public. The Maine Public Service Commission, in refusing a certificate for a 955-mile independent motor coach system, said:

"We believe that the objective to be sought, in our state at least, is a co-ordination of public automobile service with that of the steam railroads and with such of the electric railways and street railways as will lend themselves to such co-ordinated service."

The courts have returned to the New Haven Railroad its trolley lines which were taken away in 1914 in an action under the Sherman anti-trust law. The New Haven based its appeal to the court on the fact that the Public Util-

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ities Commission of Connecticut had recommended to the General Assembly a co-ordinated service as in the public interest.

There was a time when such a judicial expression would have been practically impossible, and Judge Winslow's opinion is one of the highest significance.

You may be interested in some actual examples of co-ordinated operation. The largest in this country is that of the Public Service Railway Company of New Jersey with over 800 motor coaches. The policy of the company has resulted in more frequent service, cut down the number of bus-miles and car-miles operated and increased revenue on both cars and buses. Thomas N. McCarter, president of the corporation, in a letter to the stockholders said that "There can be no doubt that if co-ordination were brought about throughout the entire territory a great betterment in conditions would result."

In Philadelphia the Mitten Management was early in adopting the motor coach to relieve certain trolley lines and to feed others, as well as to meet competition from independent operators. It is now undertaking the taxicab business on a similar basis. In announcing its plan the management said:

"Co-ordination of transportation in big cities has been a steady onward march. It is inevitable. You can no more stop it than you can stop the law of gravitation."

In Providence, R. I., motor coach service was co-ordinated with the trolley by allowing the trolleys to run as expresses, with motor coaches taking care of the local passengers. This has gained much public good will and has resulted in increased net income.

The Pennsylvania-Ohio Electric Company operates an interurban motor coach service at Youngstown, Ohio, paralleling its own trolley car lines, but at a higher fare. This operation has proved both popular and successful.

The Colonial Coach Lines operate nearly 1,000 miles of intercity routes, chiefly in northern and western New York State, but extending into Pennsylvania and into Canada. Their rates are higher than railroad rates, but the operation is popular, successful and growing.

The Chicago, North Shore & Milwaukee Electric Line, operating between Chicago and Milwaukee, declares that through their more frequent and better service motor coaches have been directly instrumental in developing traffic where very little existed before. Furthermore, the operators say that the coaches have served as an advertisement for the company and in reaching out into the territory have secured many new patrons for their main line.

Co-ordination is advancing with great strides.

Whereas in 1920 only sixteen electric railways were using motor coaches, 280 companies, according to the *ELECTRIC RAILWAY JOURNAL*, were using them in 1925, and 2,171 motor coaches were purchased by electric railway companies in 1925, more than twice as many as in the preceding year, which itself held the record. On Jan. 1, 1924, only 14 per cent of the electric rail-

ways operated motor coaches. In the following year this was increased to 19 per cent and last Jan. 1 the proportion was 35 per cent.

More than 13,000 miles of motor coach routes are now in operation by street railway companies, most of which is new service.

#### MASS TRANSPORTATION BY ELECTRIC CARS AND RAPID TRANSIT LINES

Electric cars or rapid transit trains probably will remain the chief vehicles in moving large crowds of people within rush-hour periods. Certainly they will so long as they can carry masses of people more cheaply, for there will always be people to whom the price of service is of more importance than the quality.

And while co-ordinated, each service should be permitted to retain its individuality. Then it will build up custom for itself.

There can be no doubt that existing companies are the ones to whom this job of co-ordination must fall. By virtue of training and experience in the art and science of transportation, electric railway managements, in most communities, are better prepared to operate motor coach lines than any organization without experience in transportation, a highly technical and difficult field. Transportation is both a science and an art and they have studied it all their lives.

Electric railways generally have important financial connections and resources which are necessary to assuring continuous motor coach service. This is a most important point—financial responsibility. Service by fly-by-night companies inexperienced in transportation, often formed only as stock selling propositions, can never render a continuous, dependable, comfortable and satisfactory service.

Nor should important rights be granted to applicants if they seek, with promises of lower rates, to get their heads under the tent and invade a field already occupied. Specific instances of this have lately arisen in Buffalo and in several applications for franchises in the city of New York.

Such reduced rate promises are specious, for they never can be more than temporary, and the ultimate cost to the public is greater.

Decisions of courts and commissions are full of recognition of these facts. For example, let us read from a decision by the Wisconsin commission in the LaCrosse Gas & Electric case:

"Rate wars usually mean for a time lower than paying rates, failure to keep plants in the best operating condition, and in the long run inadequate service.

"They often result in ruin of one or more of the plants concerned, crippling of the rest and in the ultimate consolidation of the remnants in one concern.

"In the end customers will lose more through bad service than they have enjoyed through temporary low rates."

Just a word on another phase of co-ordination. It is time to get away from the word "monopoly." Co-ordination being new to so many may give an opportunity to the demagogue to arouse suspicion in the public mind by crying "monopoly." It is time we ceased using

certain words and phrases that hurt us with the public.

For the best reasons of public policy should transportation companies be allowed ample earnings, to provide not only for present good service, but that future growth which the country will need.

In establishing a co-ordinated electric railway and motor coach service there will arise one point which may become of serious importance and which must be placed effectively before regulatory bodies. Superseded physical property has a definite value represented by your securities and the co-ordinated service must produce sufficient net earnings to amortize over a term of years the physical value of the superseded property. To follow any other course would discourage new investment.

Public utilities as a group are never done growing, except in a dead community. And this means that a constant supply of new capital is just as necessary as a constant supply of new coal.

There is only one way in the world for you to get this capital from the investor. He has thousands of other ways to invest his capital and he is, therefore, the final dictator. Earning power with safety is all that attracts him, and any rate of return that fails to attract the investor in needed public utility service is a rate that is against the public interest.

In my judgment the earning power of the steam railroads as a whole has never, since effective regulation began, been anything like adequate, and even more, of recent years, have the electric railways suffered.

In the manufacturing field we permit any rate of return that the manufacturer's sagacity, foresight, skill and judgment enable him to earn, even though it be 25, 50 or 100 per cent.

It is easy to see why the investor fails to be attracted by 6 per cent, or 7 or 8 per cent, as a maximum which may be earned by a transportation company which has no assurance even of that and must stand its own losses.

It is no crime to earn a net return. The net earnings of industry as a whole is the source from which all existing wealth, facilities and comfort of the world have come.

Had there never been any net return to industry mankind would still be running around naked, dwelling in caves, living on fish and native fruits.

Production and transportation are the nation's right and left arms. What shall it profit the nation if one be protected but the other be allowed to wither?

#### LIMITATION OF FAIR EARNINGS A FORM OF "PRICE FIXING"

In my humble opinion the limitation by law of profits honestly made has no place on statute books. I cannot see that, in principle, it differs from the policy of governmental price fixing for the products of any other industry. It is an attempt to overthrow the law of supply and demand, and history has yet to record any governmental effort in that direction which did not ultimately force somebody to pay a disastrous price.

Not only has your industry a right

to a good profit, but it is in the public interest that you should have it. No half bankrupt company can render good service. And your profits should be such as to enable you not only to serve the needs of the moment but to lead in new transportation development.

Next to providing transportation companies with adequate rates and

fares, public officials should reduce taxation on all forms of public transportation. Taxes add to the cost of service, and it is in the public interest to make the cost of transportation as low as it is reasonably possible. The one who uses a public utility service should pay for it rather than the taxpayer.

## The Jolly Trolleying Public\*•

BY EDWARD F. WICKWIRE  
Vice-President Ohio Brass Company

WHEN I was asked to give this little talk my first thought was respectfully to decline. I believe in the wisdom displayed by some of the so-called lower animals, such as the clam, for instance. The first thing the mother clam teaches her young is to keep its mouth shut.

However, having consented to violate the rules of the ancient and honorable order of clams, I was anxious to select a subject close to everybody—like underwear, for instance. But the program committee objected on the ground that in these winter days that subject is too rough, even for utility men. Finally we settled on the subject that is printed on the program, "The Jolly Trolleying Public." That was all right, because, like most people, I can discuss the other fellow's business better than I can talk about my own. Of course, anything that affects the electric railway industry has a direct influence on our ability to trot down to the corner grocery store on Saturday night and join in the groceryman's cash register chorus.

I am talking to you tonight not only from the standpoint of the 500,000 workmen who make electric railway supplies but also in behalf of the folks who are buying 43,000,000 electric railway rides in this country every day. How many of you have realized the fact that the electric railways of this country are furnishing 43,000,000 rides every day, and that the number is not decreasing, but steadily increasing.

When I speak of the jolly, trolleying public I am referring particularly to that part of the public which has for some years past, perhaps unthinkingly, been jolly trolleying out of existence in its conversation but still trolleying to the tune of something like 16,000,000,000 rides a year.

Try to imagine what would happen if we kicked the trolleys off the streets. If we substituted buses, that would mean something like two double-deck or three single-deck buses for every street car now in service.

If we think traffic is bad now, imagine what it would be if public transportation had to have double or three times the amount of street space during the rush hours. The buses would have to move so slowly that a tired snail with broken arches would outdistance them in half a block.

Replacing street cars with private cars would be worse. A friend of mine told me the other day he had driven his car 30,000 miles in one year—5,000

miles back and forth to work and 25,000 miles looking for a place to park.

As it is now, there is an automobile for every seven and a third persons in the United States. In other words, one out of every seven drives his own car. The fractions ride in ambulances. The remaining six evidently buy the 43,000,000 trolley rides every day, because very few of them feel able to walk.

I did hear of a Scotchman not long ago who walked 18 miles to see a football game, but he didn't gain anything, because when he got there he was too tired to climb the fence.

According to an accurate survey made here in New York, it takes seven times as much space to handle a passenger by taxi or private car as it does on a surface street car. If you include parked automobiles, it takes twenty times as much space per passenger. With these facts in mind, a man would have to be gifted with positively brilliant stupidity to claim that either the bus or the automobile could successfully take the place of the street car for mass transportation.

Russia has her Bolsheviks; we have our highly enthusiastic "Automotiviks," who advocate rubberizing all forms of American transportation, and who may, by some stretch of the imagination, have in mind stopping the production of pedestrians or perhaps producing a new race of tougher and more resilient pedestrians.

### CAN DESTROY BUT NOT REPLACE

The danger lies in the fact that competitive motor transportation can destroy a transit system which it cannot replace. Fortunately, however, people are beginning to realize that the "automotivik," the man who says buses can entirely take the place of street cars, has too much tortoise shell on his glasses and not enough focus in the lenses.

The bus has its place in urban transportation—but it is not in the place of the street car. Ask the people of Saginaw, of Toledo, of Des Moines and of Akron—the Rubber City—who tried to put buses in the place of street cars. They were mighty glad to get the cars back. They had to lose them to appreciate them—as the flea said when he left his comfortable old home on a tramp for a position on a wealthy old skinflint.

A study made in St. Louis showed that while street cars carry about 90 per cent of the people using the streets, yet they cause only 10 per cent of the congestion.

Since it is a well-established fact, then, that the electric railway is indis-

pensable, the natural question is "What about the bus?" And the answer is, "Yes, there is a place for the bus." The next question that perhaps comes to mind is, "What relation is the bus to the trolley car, if any?"

Many of the early buses started at a time when electric railway expenses had increased enormously, while their rates of fare were held down to the starvation point. It was the zero hour in electric traction history and "wildcat" jitneys and "blunder" buses showed up, not to fill a need, but to grab a chance.

Like the sixth-class passenger on an ocean liner who went to the captain and said, "Can I have a berth to sleep in?" The captain asked, "Where have you been sleeping the past four nights?" And the passenger answered, "I was sleeping on a sick man, but he got well and won't stand for it any longer."

And so it is with the electric railway industry, it naturally objects to the bus living on it, but is actively carrying out plans for the bus to live with it.

Although electric railway men were not the first to operate buses, they seem to be the first and the only ones to endeavor to put in a complete, coordinated system which uses the buses as an addition to the existing transportation system, instead of a drain upon it.

Electric railway men who are experienced transportation specialists should be given an opportunity to work out the problem along sound, sane, economic, unexcited lines. The shrieks and tirades of the politician with a megaphone voice are no more useful than the whistle on a peanut stand. It makes a lot of noise, but doesn't roast any peanuts.

It is up to the people, who need the best possible transportation service, to discourage the type of public official who insists that the street car company shall pay for paving it doesn't use, pay big taxes, pay exorbitant damage claims, or, in a word, pay to feed and house the transportation cow, and then donate to the wildcat bus equal milking rights.

They have seized on the traction issue as a convenient vehicle for personal publicity. In one respect these politicians are like shoes—the cheaper ones squeak the loudest.

It is up to us to see that the bus isn't made to answer when the street car is called, but we do want the bus to take its place in the branches of transportation for which it is especially adapted.

For instance, the bus can provide a luxurious mode of conveyance, at a high rate of fare, to people who are willing to pay for that kind of service. Also, the bus has a very distinct mission supplying transportation in outlying sections of cities and in suburban communities not sufficiently populated to warrant expensive track extensions. Such service is usually not profitable in itself and the independent bus could not survive. But as auxiliary feeders to the trolley line, its use is justified.

The bus is also a good means of tying together various railway lines in cross-town or short-cut service, where the amount of traffic does not justify the heavy investment required for street car service.

\*Abstract of address delivered at midwinter meeting of New York Electric Railway Association, New York, N. Y., Jan. 27, 1926.

Used in that way, the bus reduces still further the necessity for walking, and that seems to be the aim of most people nowadays.

The problem resolves itself, then, into a matter of constructive co-ordination, instead of destructive competition. This will be a distinct disappointment to people who think it is more fun to throw bricks than to lay them.

The keystone of a well-balanced transportation system, using street cars and buses—each in its proper place—is recognition of the undeniable fact that public transportation is a natural monopoly, especially since it is subject to the strictest kind of regulation—sometimes this regulation almost amounts to strangulation. Perhaps some of you have the thought in the back of your heads that competition is a good rule. Generally speaking it is. But there are exceptions to all rules, no matter how good. For instance, "start at the bottom" is a good rule to follow, but it's even advisable to make an exception to that rule when you're learning to swim.

The transportation companies which operated horse cars and cable cars in the old days discarded them when the electric car was developed. And they may discard the electric car in time, but not until the right substitute has been devised.

Meantime, the bus and the trolley car, both controlled and routed by one responsible transportation agency, are the best means yet discovered for providing quick, convenient and cheap transit for the majority of the people.

So why not let the electric railways, which are transportation specialties, work out the problem, not hampered by too many restrictions? Some legislators seem to jump out of bed every morning with an idea for a new law about traffic. For example, a bill was recently proposed in a Western state providing that night-driven herds of cattle on the highway must be equipped with tail lights.

I believe it would be better to enact a law compelling all pedestrians to be equipped with reflectors—red lights for females under 30, violet for grass widows and green for old maids. In that way a lonely motorist could tell at a glance whom to pick up and whom to run over.

As a closing thought I would like to say that while it is a good idea to give buses all the backing they deserve, it is certainly a mistake to let them run over the backbone of mass transportation—the electric street car.

I think I'd better quit right here, before you commence to think that I'm trying to imitate that famous Chinese orator "On Too Long."

for a press agent interpreter, as it was a question of what the public wants to know and what the utility must know regarding public thought.

At the afternoon session W. J. Horigan, consulting engineer, Louisville, discussed "Water Supply from the Standpoint of the Public Utility Company." Helen E. Steiner, director of public relations of the Ohio Public Service Company, made a few remarks regarding the co-operation of the women's committee in Kentucky and the excellent co-operation given by the utility executives in the state to the work of the women. She introduced Miss Isabelle Davie, secretary of the women's committee of the headquarters staff, N.E.L.A., New York City, who discussed "Women's Work in Public Utilities." N. M. Brigman, dean of the Scientific School, University of Louisville, discussed "Engineering Schools and Industry."

W. H. Hodge, manager advertising department, Byllesby Engineering & Management Corporation, Chicago, discussed "Customer Relations." He argued against suits against customers, for cutting red tape, quiet, sensible telephone operators, with pleasant voices and trained to their work, and a liberal policy, even if it meant smashing a lot of rules.

Dr. W. R. Jillson, State Geologist of Kentucky, in a talk on the "Natural Resources of Kentucky," said that state was on the threshold of a day in which public interest would turn to internal industrial development.

Officers were elected for the coming year as follows:

*President*—T. B. Wilson, vice-president and general manager Louisville Gas & Electric Company.

*First Vice-President*—H. J. Cochrane, president Maysville Public Service Company.

*Second Vice-President*—W. R. Power, general manager Ohio Valley Electric Railway.

*Treasurer*—A. A. Tuttle, treasurer Kentucky Utilities Company.

*Secretary* (re-elected)—E. P. Kelley, assistant to president Louisville Railway.

*Executive Committee*—J. P. Barnes, L. B. Herrington, W. H. Harton, J. P. Pope, P. S. Poge, H. D. Fitch.

About 150 utility men were present at the morning session and a slightly increased number at the afternoon session. On the evening of Jan. 14 there was a get-together dinner-dance in the crystal ballroom of the Brown Hotel at 7 o'clock. J. P. Barnes was toastmaster and welcomed the visitors. About three hundred attended the dinner-dance.

### New England Street Railway Club

THE February meeting of the New England Street Railway Club will be held at Copley Plaza Hotel, Boston, Mass., on Thursday, Feb. 4, 1926.

There will be two sessions. The afternoon session will be called to order at 4 p.m. and will be devoted to three short papers on the subject of "Bus Maintenance." They will be presented by C. V. Wood, Jr., superintendent of bus division, United Electric Railways, Providence, R. I.; H. L. Sullivan, automotive engineer Eastern Massachusetts

## Diversified Program at Louisville Meeting

Many Matters Discussed in Short Talks During One-Day Session of Kentucky Association of Public Utilities—Officers Were Elected and a Dinner-Dance Was Held

DISCUSSION of service matters, public relations, safety, advertising and publicity, co-operation between employer and employee and methods of improving the employee occupied an interesting one-day session of the Kentucky Association of Public Utilities, held at Louisville, Jan. 15. J. P. Barnes, president Louisville Railway, and president of the association, managed the program so that a large number of subjects were discussed and papers read during the short period of time available.

N. W. Funk, director of safety Louisville Railway, stated that in 1924 an economic loss of \$500,000,000 was caused over the United States by accidents, that 100,000 people were killed and a million others injured in avoidable accidents. He discussed the remarkable improvement in facilities for the pleasure and convenience of mankind over the last quarter of a century, which have, however, increased hazard and made safety work more important and necessary.

D. L. Gaskill, secretary-treasurer of the East Central Division, National Electric Light Association, Greenville, Ohio, discussed "Value of Associations to Utility Men," bringing out that through associations utility men have secured a much better grasp of conditions and interchanged information.

Harry Reid, president Interstate Public Service Company and president Kentucky Utilities Company, talked on the "Future of the States' Utilities." He

told of the formation of the association ten years ago with about eight present at a meeting at the office of the Louisville Railway, the small start growing into a large association and an organization for general good.

E. A. Jonas, editor-in-chief Louisville *Herald-Post*, delivered a humorous talk, on "What Is Power," referring to the power of the press, power of man, power of natural resources. George Colvin, superintendent Louisville & Jefferson County Children's Home, talked on "Public Utilities from the Citizens' Standpoint," holding that the industry was on the threshold of even bigger things than have been accomplished.

Labert St. Clair, director of publicity American Electric Railway Association, discussed "Don't Hesitate to Talk About Yourself." He argued for application of the golden rule, holding that it must be said, not sung from behind screens and frosted windows. He stated that today utilities were spending \$20,000,000 to \$25,000,000 annually on publicity and advertising and that it was doing a lot of good.

Dempster MacMurray, director of advertising and publicity Middle West Utilities Company, Chicago, discussed "Relations of Public Utilities to the Press," in which he outlined the fact that the public had learned to depend upon the press for information concerning plans and policies of utilities and wanted the real information, not propaganda. He held that it was no place



Street Railway, and D. S. Mackay, supervisor of automotive equipment Boston Elevated Railway.

The evening session will be held in the Swiss Room of the Copley Plaza Hotel and the following papers will be read:

"Relation of the Bus to the Street Railway," by W. B. Spencer, assistant to president United Electric Railways, Providence, R. I.

"Buses as Used on the Boston Elevated Railway," by Edward Dana, general manager Boston Elevated Railway.

"How to Use Buses to the Best Advantage," by C. T. Seeley, vice-president Chicago Motor Coach Company, Chicago, Ill.

This is the last meeting before the annual meeting and banquet, which will be held on March 25, 1926.

## New Officers for Engineering Council

AT THE annual meeting of the American Engineering Council, held in Washington, D. C., Jan. 13-15, Déan Dexter S. Kimball of Cornell University was elected president. The vice-presidents elected were: Gardner S. Williams, Ann Arbor, Mich.; O. H. Koch, Dallas, Tex.; I. E. Moulthrop, Boston, Mass., and A. W. Berresford, New York City.

Dr. H. E. Howe, Washington, D. C., was re-elected treasurer and Col. John H. Finney, Washington, chairman of the finance committee. L. W. Wallace was again elected executive secretary.

no definite procedure had been provided for submitting such standards to the membership for approval for inclusion in the Engineering Manual. After discussion Chairman Harte appointed the following sub-committee to study the entire matter of procedure: Charles R. Harte, chairman; R. H. Dalgleish, M. B. Rosevear and G. C. Hecker.

Chairman Harte transferred Mr. Dalgleish from the sub-committee on the program for equipment day at the convention to the sub-committee on the program for way and structures day.

The secretary read a letter from the American Society of Mechanical Engineers and the National Machine Tool Builders Association inviting the association to be represented on a sub-committee on standardization of tool holders and tool post openings. This project is a part of the work of the central committee on standardization of small tools and machine tool elements.

After discussion it was voted to inform the sponsor bodies that the association does not feel that its interests in the project are sufficient to warrant the appointment of a representative. It was decided also that the secretary should bring this project to the attention of the chairman of the equipment committee, requesting that he keep in touch with the movement as far as possible.

A letter from H. F. Brown, chairman of the committee on heavy electric traction, was read, suggesting that the publication of the Bibliography on Heavy Electric Traction might be financed by selling advertising to a selected list of manufacturers. Mr. Brown's feeling was that a number of the manufacturers were very much interested in having the Bibliography published. The executive committee felt that Mr. Brown's plan was worthy of serious consideration. It was voted to have Chairman Harte refer the matter to the committee on policy of the American Association.

A letter from James S. Mahan, Western Actuarial Bureau, was read, in which he pointed out that in the work of certain committees of the Engineering Association there would be an advantage in having someone familiar with fire insurance standards designated to work with these committees. After discussion Mr. Hecker was authorized to communicate further with Mr. Mahan and obtain any definite suggestions he had to make.

An invitation was received from the public utility group of the National Association of Purchasing Agents to send a representative to a conference which will be held in Schenectady on Jan. 28 and 29. The invitation had been referred to P. F. McCall, chairman of the committee on purchases and stores, who had arranged to send C. J. Swift, purchasing agent Chicago, North Shore & Milwaukee Railroad, to the conference.

A letter from the All-American Standards Council urging the association to support the pending metric standards bill (H. R. 10) was read and discussed. The secretary was instructed to acknowledge the letter and thank the All-American Standards Council for bringing the matter to its attention.

## American Association News

### Engineering Executive Committee Meets

Charles Rufus Harte Elected President, Succeeding Roy C. Cram, Who Tended Resignation—Considerable Routine Business Transacted

ROY C. CRAM tendered his resignation as president of the Engineering Association in a letter dated Jan. 15. A special meeting was called for Jan. 23 to consider it. At this meeting, which was held at association headquarters, with First Vice-president Charles Rufus Harte in the chair, President Cram's letter of resignation was presented by Secretary Welsh. It is as follows:

January 15, 1926.

TO THE EXECUTIVE COMMITTEE,  
AMERICAN ELECTRIC RAILWAY  
ENGINEERING ASSOCIATION,  
GENTLEMEN:

I have recently made a change in my company connections and find my duties there, combined with some matters of a personal interest, will require a great deal of my time.

I have found so far that the work involved in the office of president of the Engineering Association consumes a great deal of time and for the best interests of the association, as well as myself, I very reluctantly tender herewith my resignation as president of the American Electric Railway Engineering Association, which I hope will be accepted at your earliest convenience.

Thanking you for the splendid co-operation which I have had, I beg to remain,

Yours very truly,  
(Signed) ROY C. CRAM.

The executive committee, on motion by Mr. Dalgleish, seconded by Mr. Graves, voted to accept with regret the resignation of Mr. Cram.

Acting Chairman Harte, asking Mr. Dalgleish to take the chair, offered the following resolution, to be spread upon the minutes and a copy transmitted to Mr. Cram:

Inasmuch as Mr. Roy C. Cram has changed his business connections, and having found his new duties require so much of his time that he feels he cannot properly attend both to this and to his duties as president of the American Electric Railway Engineering Association, he has accordingly tendered his resignation as president, to take effect at once; the executive committee of the Engineering Association, while greatly regretting the necessity for this action, can only accede to Mr. Cram's request.

From his first connection with the organization Mr. Cram has been an indefatigable worker, as an individual member of committees, as committee chairman, and in recent years as a member of the executive committee culminating in his election to the presidency of the Engineering Association.

Bringing to his work a never-failing enthusiasm and an untiring energy, Mr. Cram has materially advanced the work and the interests of the Engineering Association, and in accepting his resignation the executive committee hereby formally records its recognition and appreciation of Mr. Cram's services to the Engineering Association.

On motion by Mr. Harte, seconded by Mr. Durie, the resolution was unanimously adopted.

Mr. Harte then resumed the chair. On motion by Mr. Dalgleish, seconded by Mr. Miller, Mr. Harte was unanimously elected president to fill the unexpired portion of Mr. Cram's term. No action was taken to fill the vacancy existing on the executive committee.

### ROUTINE BUSINESS TRANSACTED

Immediately following the adjournment of the special meeting a regular business meeting of the committee was called by the newly elected president, Mr. Harte.

The executive committee was advised of the approval by the way and structures committee of the simplified practice recommendation on shovels, scoops and spades. The executive committee voted unanimously in favor of indorsement by the association of this project.

Several matters in connection with the work of the American Engineering Standards Committee were considered. The question of the appointment of an alternate to Mr. Dalgleish on the main committee was discussed. The committee voted to authorize the president to appoint an alternate at the earliest possible moment.

The secretary announced that a final report on the design of plain girder rails for use in paved streets had been received from the sectional committee on special trackwork materials and plain girder rails. The committee on way and structures unanimously approved the report. The executive committee then approved the report and authorized its submission to the A.E.S.C. for approval as tentative American standard.

In referring to the procedure set up for handling the reports of sectional committees under the sponsorship of the association, it was pointed out that

# Maintenance of Equipment

## Spray Painting Used in Chicago

BY W. C. WHEELER  
Equipment Engineer  
Chicago Surface Lines

CARS are separated into three general classes for painting in the shops of the Chicago Surface Lines. In the first class are included new cars constructed and cars to be rebuilt. These naturally require the greatest amount of painting work. The second class includes cars in for overhauling and the third class cars which are to be repainted.

The preparation of the new car for painting begins very early in the

On the eighth day the paint is allowed to dry, followed by a coat of red color varnish and a second coat of cream color varnish on the ninth day. Lettering, numbering and decorating are done on the tenth day. On the eleventh, thirteenth and fifteenth days the first, second and third coats of body finishing varnish are applied. This allows the varnish to dry on the twelfth and fourteenth days.

Construction of the woodwork portion of the car body is carried on simultaneously with this painting program, so that the painting of the interior can be done at the same time as that of the exterior. Special pre-

torch and scraped. The steel panel cars are sandblasted clean. After this the treatment is practically the same as for a new car. This class also includes cars on which a great deal of new work is necessary during a general overhauling.

The third group of cars includes those which are still in good physical shape but which can be helped greatly in appearance by a coat of paint and varnish. These cars are washed thoroughly and any small scratches or breaks in the wood are primed, filled with putty and then the entire surface is given a coat of color varnish. After the lettering, striping and decorations are retouched the car is given one or two coats of finishing varnish as conditions require.

In order to reduce the time necessary for the car to be held out of service during the painting process, time-saving methods have been introduced from time to time. One of these is the use of the spray gun to paint the roofs, trucks and under parts of car bodies. The lettering, numbering and decorating of the car, with the exception of the striping, are done with decalomania transfers, which permit a great saving of time over the old method of hand work.



Applying a Coat of Paint to the Roof



Spraying the Car Body

assembly of the body, for all metal parts are given a coat of red lead wherever they come in contact with other metal. After assembling the frame and before any woodwork is placed thereon the entire surface for exterior painting is sandblasted so that it is clean and in proper condition to receive the coat of priming paint. After this is applied, the car is allowed to stand for at least one day before a coat of process No. 2 is applied.

On the fourth day a coat of thin putty, or what is known as knifing compound, is applied to give a smooth surface. The fifth day the surface is sanded with linseed oil and benzine, and a second coat of process No. 2 is applied on the sixth day. The seventh day the surface is smoothed with dry sandpaper and one coat of red ground color is applied to those parts of the body that are painted red and a coat of cream ground color is applied to the rest.

cautions are taken to see that the interior receives a very fine finish, as well as one that prevents deterioration due to improper protection. The floor is painted underneath as it is being laid and then it receives three coats of paint after it is in place, the last coat being a varnish color. Forty-eight hours are allowed to elapse between coats, so that the paint may dry thoroughly. All interior woodwork is oiled with boiled linseed oil and stained to a uniform color, after which it receives two coats of varnish and is rubbed down to a dull, smooth finish. The roof boards are painted with one coat of paint and the canvass is applied while the paint is wet. The roof is then given two coats of paint.

The second class of cars includes those whose condition is such that the old paint must be entirely removed and a new surface prepared. Cars with wooden panels have the old paint burned off with a gasoline

## Steel I-Beam Under Joints in Concrete Paved Track

SPECIAL concrete construction has been adopted for car tracks in Augusta, Ga., regardless of the type of street pavement. The construction used at joints to prevent depressing of the tracks under passing cars and so produce strains in the paving, which might result in cracks, is told in the *Concrete Highway Magazine* for November, 1925. A steel I-beam is welded under each rail joint and a 3-ft. x 3-ft. concrete block, 19 in. thick, is cast under the beam for a foundation. This construction provides a rigid track which is not depressed by passing cars and in which the rails, ties and adjacent pavement all work together to support the load.

Concrete paved streets vary in

width from 24 ft. to 50 ft., exclusive of the car tracks. Transverse expansion joints are installed at intervals of from 40 to 75 ft., depending upon the distance between street intersections. A 2-in. board is used as the expansion material. This board is cut to the exact cross-section of the street and, until the concrete is

filled with 1:1½:3 concrete. This makes a rigid concrete construction and the steel beam to support the joint has proved of particular benefit. The electric railway company prepares the track and the city pays for the paving.

### Calorizer Equipment for Shop Furnaces

**E**FFICIENCY in the Cold Spring forge shop of the Milwaukee Electric Railway & Light Company has been improved considerably by equipping the fuel-oil-fired heating and annealing furnaces with calorizers. The accompanying illustration shows one of the furnaces in operation with the calorizer equipment.

The calorizer is shown at the right-hand side of the furnace and consists of a box-shaped attachment with an atomizer and gasification and combustion chambers. The small pipe from below leading to the calorizer feeds the fuel oil from the large storage tanks, while the large pipe over the furnace to the calorizer delivers the low-pressure air required. This air is supplied from a direct-connected motor-driven blower mounted to the left of the furnace.

In the calorizer the fuel oil is atomized and intimately mixed with air and so serves the furnace in a similar manner as the carburetor serves a gasoline engine. Provision

is made for quick gasification, followed by the addition of the exact amount of air to insure the most perfect combustion possible. Low-pressure air at from 8 to 12 oz. per square inch is used for both atomization and combustion.

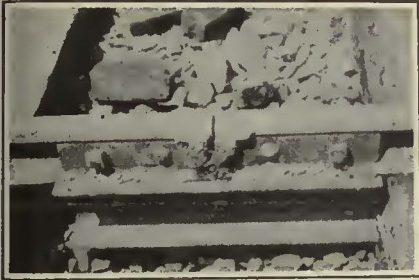
The temperature and composition of the gases in the calorizer-equipped furnace are under the control of the operator and any conditions desired can readily and easily be secured and maintained. There is also a more even distribution of heat throughout the furnace and very little if any gases or smoke are emitted. This gives more satisfactory working conditions. Increased production results from the time saved from bringing the furnace up to proper heating temperature by properly controlling the temperature and by improved distribution. These economies have more than justified the change from the old style oil burner to the calorizer for the oil-fired furnaces.

### Redwood Blocks Make Durable Shop Flooring

**F**OUR-INCH blocks cut from new redwood ties were used recently for a wood-block flooring for the machine shops of the Los Angeles (Cal.) Railway. This made a cheap, durable flooring, easily constructed by unskilled labor, which is giving satisfactory service.

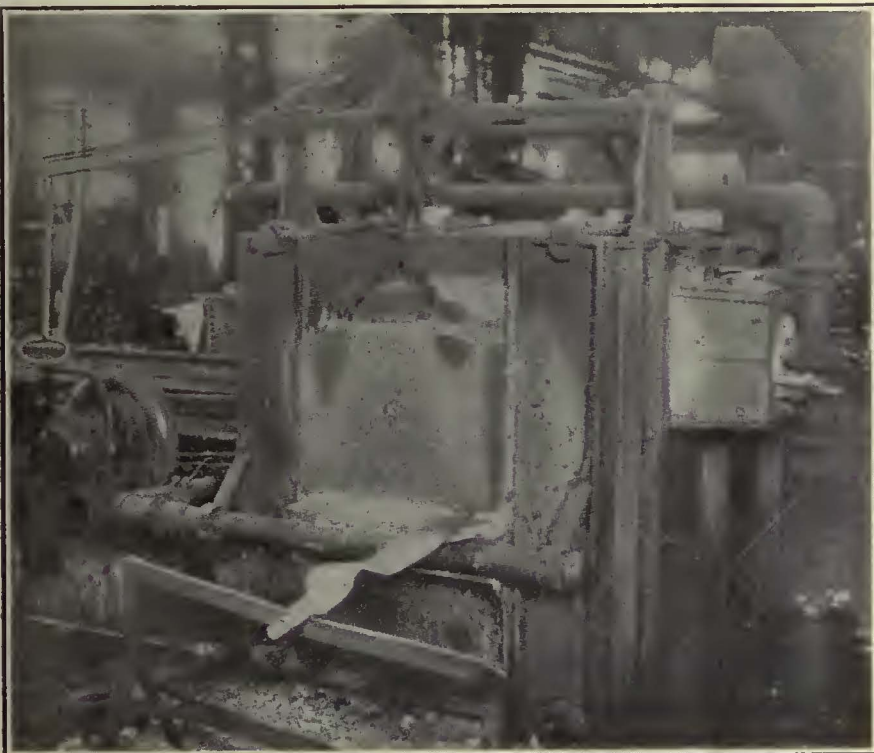
The ties, each 6 in. x 8 in. x 6 ft., were first surfaced on four sides to insure uniformity. After the blocks were cut they were creosoted and placed on end, ¼ in. apart. The sub-base was then graded and rolled and any depressions were filled with dirt and rerolled to insure a firm foundation. Grade stakes were set about 10 ft. apart and a base of 5-in. concrete was poured, care being taken to surface this as level and smooth as possible. This was necessitated by the fact that no sand cushion was used. The blocks were placed directly on the concrete base, which was first thinly surfaced with hot asphalt, and they were set into the asphalt while it was still liquid. By hitting the block with a wooden mallet, it was found to stick to the asphalt and was thus held in position until the entire floor was laid.

A ⅝-in. x 1-in. x 1-in. angle iron 6 ft. long, on which two small handles had been welded, was placed over the first row of blocks along the wall at one edge of the area to be

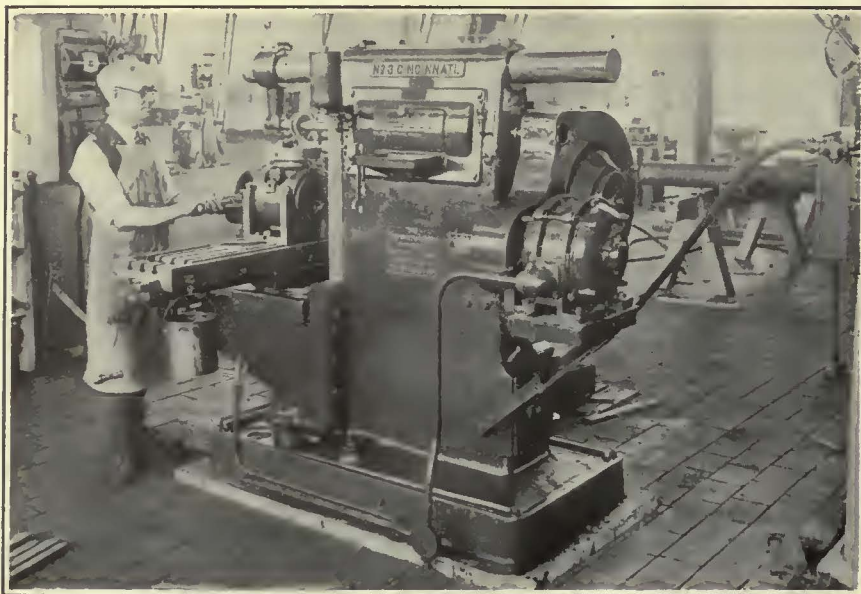


A Steel I-Beam Supported on a Concrete Pier Is Welded Under Each Rail Joint in Concrete Paved Track in Augusta

placed above it, is held accurately at right angles to the pavement surface by stakes. When the top of the board has been worn off by traffic, the joint is filled in with bituminous material. The street railway company's charter provides that the city must maintain all paved car-track areas. Driveways on either side of the track are paved to within 18 in. of the rail. After this pavement has hardened sufficiently to permit working on it the car-track area is paved. The space between the bottom of the ties and the top of the rail is



Calorizer-Equipped Furnace in the Cold Spring Forge Shop of the Milwaukee Electric Railway & Light Company



Wood-Block Flooring In the Shops of the Los Angeles Railway

laid. The next row was then placed snugly against it, securing alignment of each succeeding row. Several piles of loose sand were dumped on the surface after all blocks had been

placed and this fine sand was swept into the cracks between blocks. Oil from various machines eventually saturated this sand, holding the blocks firmly in place.

## New Equipment Available

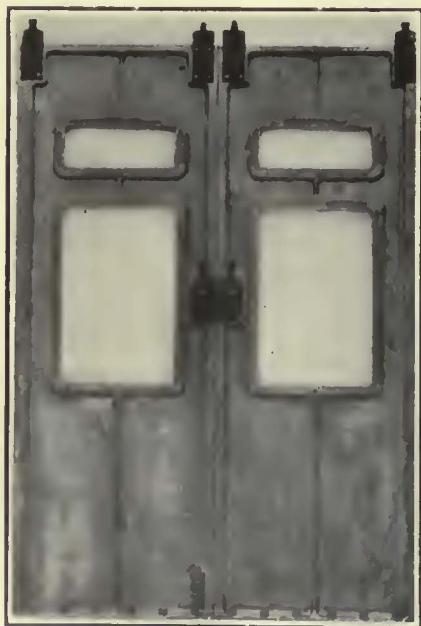
### All-Metal Car Doors

**M**ANUFACTURED from a new aluminum casting alloy, a new design of door for electric cars has been patented and put on the market by Lightalloys, Ltd., London, England. The alloy used for the construction of these doors is a binary

one, containing 86.5 per cent of aluminum and 13.5 per cent of silicon. These materials are subjected to a special refining and modifying process in the foundry. The treatment changes the original properties of the alloys and produces a fine grain material having great strength, ductility and toughness. The tensile strength under test amounts to approximately 13 tons per square inch with an elongation in 2 in. of 7 per cent.

Advantages of this type of door over built-up wooden construction are that the metal door is more rigid and there is no tendency to warp when exposed to bad weather conditions. The design of the metal door provides a wide extension at the lower end, and when mounted as a sliding door in electric car service danger from jamming or tilting is reduced.

The mounting for sliding consists of two ball bearing wheels, the inner race being stationary and held in position by three rivets which pass through two steel plates into recesses in the main casting. The outer race, which is free to rotate, is formed with a groove and runs on a rail fixed to the floor of the car. The

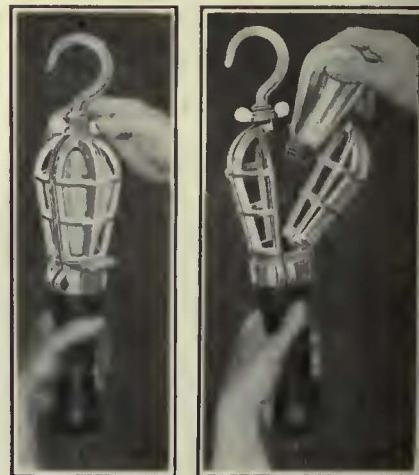


Aluminum Sliding Doors for Electric Car Service

top guide is of extruded manganese bronze. A flexible edging is provided which consists of rubber, vulcanized onto patent leather. This is fixed firmly to the front edge of the door by means of aluminum binding strips. A long strip of rubber fastened on the back of the door acts as a dust excluder when the door is closed. The slot for housing the roller guide used in mechanical opening and closing of the door is lined and faced with bronze. A small plough is fastened to the bottom front end of the door to keep the sliding rail slots clean.

### Safety Guard on Lamp

**C**ONSTRUCTED to withstand the severe service encountered in electric railway shops, a hand lamp with strong safety guard has been brought out by the Crouse-Hinds Company, Syracuse, N. Y. The guard and half shade are made of special aluminum alloy, which is light in weight but very strong and tough. The hook at the end of the guard is large and strong and is swiveled so that when half a shade is used the light can be directed as



Construction of Safety Hand Lamp. At Left, Guard Closed; at Right, Guard Open

desired. A compression washer prevents a twisted lamp cord.

The handle is of seasoned maple, black enameled, and contains the lamp socket and a strain release cord clamp. The socket is of weather-proof type and is made of heat-resisting, molded, insulating material. The guard may be opened by a few turns of a wing nut which holds the parts together at the top. The hinged side of the guard swings back and gives free access to the lamp. There are no detachable parts which might be lost easily.

# The News of the Industry

## Franchise Committee Appointed in St. Louis

Mayor Victor J. Miller of St. Louis, Mo., has appointed a special committee to draft an ordinance embodying a franchise for the St. Louis Public Service Company, which has been organized to take over the properties of the United Railways. When the ordinance draft is completed Mayor Miller will invoke the initiative provisions of the city charter to submit it to a vote of the people for ratification. The committee will be composed of the Board of Public Service, the Comptroller, the President of the Board of Aldermen, the City Counselor, the committee on public utilities of the Board of Aldermen and the Mayor.

The action of Mayor Miller assumes that the receivership of the United Railways will be lifted at an early date. It is probable that on Feb. 15 Federal Judge Faris will conclude the litigation involving the affairs of the company, join all the issues and order a sale of the properties of the company under foreclosure.

An amendment to the public service commission act passed by the Missouri Legislature of 1925 provides the manner in which a service-at-cost system may be put into effect. The amendment was passed at the instance of the reorganization committee of the United Railways. It defines and provides the service-at-cost arrangement.

It is believed that the basis for the new franchise will be the finding of a transit survey by the St. Louis City Plan Commission made in 1920. This will be revised and brought up to date. It is also believed that the new measure will provide specifically for co-ordination of street car and bus. Mayor Miller favors that plan.

The 1920 survey report provided for eight main arteries of traffic from the down-town district, all other streets being left clear for vehicular travel. It also provided for the rerouting of various lines. It covered 370 miles of track and 70 per cent of the city's area. It was based on the assumption that a quarter mile walk to a street car is "easy walking distance," and on that theory recommended the elimination of 65 miles of street car tracks by shortening and straightening existing car lines.

The City Plan Commission recommended against the establishment of a rapid transit system. It contended that the volume of traffic in any one direction was not sufficient to warrant the outlay.

In recent months the city, through a special committee of the Board of Aldermen, has made a special rapid transit survey. This report is now in preparation. C. E. Smith, consulting

engineer for the Department of Public Utilities, who is in charge of the details of this survey, favors the creation of a rapid transit system, including subways in the down-town district.

## Fare Question Up at Louisville

The question of whether the Louisville Railway, Louisville, Ky., will get an increase in fare from 7 cents cash, with a 6-cent ticket fare, to a straight 7-cent fare was expected to come close to settlement at a meeting scheduled

for Jan. 26, at which officials of the railway were to meet members of the Board of Works. The railway's statement for the twelve months ended Dec. 31, 1925, shows that the barometer fund is under the \$200,000 limit, at which, under existing agreement with the city, the fare would increase automatically on Feb. 1.

It is understood that members of the Board of Works conferred a few days ago with the City Attorney and officials of the Public Utilities Bureau about the railway's statement.

## Railway and Bus on Super-Highway

Elaborate Program of Detroit United Contemplates Use of New Lightweight Cars and Double-Deck Buses—\$1,000,000 Program for Detroit-Pontiac Line

A. L. DRUM, executive manager for the receivers of the Detroit United Railway, has outlined contemplated improvements in the D. U. R. service between Detroit and Pontiac and cited reasons for the company's contention that it should have control of the transportation on Woodward Avenue, where the Detroit Motor Bus Company has also petitioned the Public Utilities Commission of Michigan for permission to operate. It was intended to hold the hearing in Lansing on Jan. 26.

It is pointed out by Mr. Drum that in the development of the super-highway between Detroit and Pontiac the Detroit United Railway has co-operated to the utmost with state authorities during the past construction season and it is the earnest desire of the receivers to continue that co-operation. The state's plan for this wider Woodward Avenue involved relocating the railway's tracks in the center of the highway. The company owned certain tracts of land and private rights-of-way, but it joined in the Governor's program. The work done so far, together with that to be accomplished this year, involves the company in an expenditure of more than \$300,000 for track and overhead.

Fully appreciating the rapid development of this section of the territory served by the company, a construction program has been started as part of which the company is now receiving ten of the most modern light-weight cars particularly adapted for this service.

The D. U. R. will shortly start a limited service every hour on the hour between Detroit and Pontiac. Stops will be made only at the principal cities and important intermediate points. When the line is functioning as anticipated, new and additional outlay on this division for cars, tracks, terminal stations and buses will be more than \$1,000,000.

As soon as the double tracking is complete and the road brought to grade

throughout, waiting rooms and shelter stations will be provided and well-lighted passenger platforms for the rail passengers will be placed within the curb line out of the way of general vehicular traffic.

Mr. Drum expects that the new electric car and bus passenger terminal station at Highland Park, opposite the Ford plant, will become one of the busiest passenger stations of its kind in the United States. It is expected that very heavy short line electric rail and bus service will be operated from this Highland Park terminal station northerly over Woodward Avenue to the several cities and communities along the route, so as properly to fit the carrying capacity and routes of electric car and bus service to the volume of the traffic between Highland Park and Pontiac and the intermediate cities and communities.

It is pointed out that to supplement the rail service the receivers recently purchased the Star Motor Coach line, operating in this territory, to the end that rail and coach service may be properly co-ordinated and properly administered.

The management of the D. U. R. is rapidly organizing and improving bus operation between Detroit and Pontiac. It proposes to add new and improved motor coaches to this service as rapidly as possible. The existing equipment is being overhauled and newly painted. Application has recently been made to the Michigan Public Utilities Commission for authority to try out a special short line service from the Highland Park terminal to Ferndale, Pleasant Ridge and Royal Oak. Double-deck motor coaches seating 60 passengers will be run. It is the expectation to operate many double-deck coaches on the Woodward Avenue super-highway from Highland Park to Royal Oak, Birmingham and Pontiac to serve the peak loads of traffic to and from the industrial plants. These vehicles will be

especially advantageous in serving the large volume of excursion and sight-seeing traffic that will be attracted to the Woodward Avenue super-highway during the spring, summer and fall.

Mr. Drum further points out that unified operation will unquestionably produce greater benefits to the people than can any competitive operation, particularly where there is such absolute control by the authorities as in Michigan. According to Mr. Drum anything less than unified operation will have an ill effect upon the people through eventual poorer service or higher fares, or both.

### Seek Better Service in Nashville

Conferences between engineers of the Nashville Railway & Light Company, Nashville, Tenn., and the Railroad and Public Utilities Commission will be held in an effort to work out some plan to relieve traffic conditions in the downtown section of the city. This decision was the result of a hearing before the commission. The company announced it welcomed suggestions about its service.

### Interstate Sunday Passes Added at Wheeling

Following expiration of the formal 30-day notice required by the Interstate Commerce Commission, the Wheeling Traction Company, Wheeling, W. Va., added a series of interstate Sunday-holiday passes as of Jan. 24. The new passes are: "Ohio," from Wheeling to Martin's Ferry, Lansing and Bellaire, 25 cents; "Ohio-Greater Wheeling," from the continuous community Warwood-Wheeling-Benwood to Martin's Ferry, Lansing and Shadyside, 50 cents; "Ohio Terminals," from Wheeling to ends of lines at Rayland, Barton and Shadyside, and "Windsor," from Windsor to Steubenville, 50 cents. The Wellsburg-Weirton 50-cent pass and the "Universal" \$1 pass were liberalized to take in Steubenville and all Ohio routes respectively. The Steubenville-Brilliant (Ohio only) 25-cent pass was added Jan. 1, following the West Virginia passes inaugurated Dec. 25. A novel feature in the sale of this pass is that tickets are accepted in payment, owing to the fact that most regular riders are supplied with strip tickets and are therefore less inclined to lay out additional cash.

### Messrs. Stotesbury and Mitten Settle Differences

The following announcement was issued on Jan. 27 by the Philadelphia Rapid Transit Company:

Through the good offices of General Atterbury, the unfortunate misunderstanding which has existed between Messrs. Drexel & Company and the P. R. T. management has been completely removed.

Mr. Stotesbury and Mr. Mitten met in General Atterbury's office just before Mr. Stotesbury left for the South and agreed to work together in harmony for the advancement of the city.

E. T. Stotesbury is head of the banking house of Drexel & Company. Thomas E. Mitten is chairman of the executive committee of the P. R. T. and president of Mitten Management, Inc. General W. W. Atterbury is president of the Pennsylvania Railroad.

### Christmas "Lucky Bags" Sold at Baltimore

Street car fare tokens as appropriate Christmas presents attracted considerable attention in Baltimore when the United Railways offered them as a solution to the "what to give" problem. Shortly before Christmas the company publicly announced "Lucky Bags" of car checks as useful and economical Christmas gifts.

The "Lucky Bags" consisted of a small green bag tied with red ribbon and sealed with red wax. Each bore a gift card with the following:

In wishing you the best of luck  
Upon this Christmas Day  
I'm sending you these tokens,  
Which will help you on your way.


Each "Lucky Bag" contained thirteen tokens, each good for one fare on the cars of the United. The bags were sold at 98 cents each. The fare is 7½ cents, when tokens are used, and the United pointed out that the additional half cent helped to defray the cost of the bag, ribbon, seal, card, etc. The company stressed the fact that the "Lucky Bags" made acceptable gifts for "friends, relatives, the office boy, the stenographer, the cook, the maid, the elevator boy, the ice man, the coal man, the janitor, your Uncle Bim—in fact, everybody."

The "Lucky Bags" were sold at the offices of the United and at a large number of stores, banks and other places in all parts of the city.

### "Use the Car" Campaign in Birmingham

The Birmingham Electric Company, Birmingham, Ala., owner of the electric railway system at Birmingham, is conducting a campaign to induce the public to use the street cars more and

**You Are Wasting**



**Time  
and  
Money**

*If You Don't  
Use the Street Cars*

**In going to and from the  
congested business area**

*"Save the Difference"*



The Message of the Birmingham Company

the automobile less for business purposes. Attractive display advertisements are appearing in the Birmingham newspapers.

The parking problem in the downtown section is a matter that is giving the city officials serious concern. The Birmingham Electric Company is taking advantage of the situation and is advising the public to ride the street cars as a means of solving the parking question.

### New York-New Jersey Loop Line Suggested for Commuters

Speedy construction of an interstate rapid transit loop, 17 miles in length with tunnels under the Hudson River at the Battery and West 57th Street, New York, has been recommended by the North Jersey Transit Commission in its report submitted to the Legislature by Gov. A. Harry Moore. The cost of constructing the loop, which would consist of a subway in Manhattan and elevated or depressed tracks on the New Jersey side, was estimated at \$154,000,000, with \$40,000,000 additional for equipment.

Governor Moore said:

Having in mind that it will take probably from eight to ten years after actual construction has been commenced to complete an adequate transportation system, and that suburban terminals are now practically at the saturation point, it is obvious that the solution of this problem may not longer be delayed.

Governor Moore recommended that the commission not only be continued with a proper appropriation but that it receive broader powers of negotiation, such as would be necessary with the authorities of New York State and New York City, if the plan was to be carried out.

A bill designed to establish the commission as a statutory body, instead of one depending upon each Legislature for continuance, has been introduced by Senator Mackay of Bergen County. This bill authorizes the appointment by the Governor of a commission of seven members.

The recommendation for the construction of an interstate loop was only one of many by the commission for the relief of congestion in the so-called "inner ring" of New Jersey, consisting of Hudson, Essex, Bergen and Passaic Counties, within a radius of 20 miles from the City Hall in New York. This territory, the report said, has an area of 706 square miles, a population of 1,951,000 and tax ratables of \$3,122,000,000.

### Limited Cars for Rush-Hour Service

The New York State Railways notified the Public Service Commission on Jan. 20 that it would put into effect the commission's suggestions for limited cars for through service from Utica to Clinton between 4.30 and 5.30 each afternoon. The limited cars will leave Utica at 4.30, 5 and 5.30 p.m. The purpose of the through cars is to meet the objections of patrons of the Clinton-Waterville bus line that Clinton cars were crowded each night during the rush hour with Utica city passengers. The company also notified the commission that it had instructed its operators to delay the departure of cars from Clinton when buses of the Barber company are in sight in order to accommodate passengers going to Utica.

## Contract Signed in Chautauqua —Students Will Have Service

The Board of Education of Chautauqua, N. Y., has signed the guarantee agreement with the Chautauqua Traction Company which provides for the operation of one passenger car for the purpose of transporting school children and for such additional cars as may seem wise. This is the result of negotiations between representatives of the Chautauqua Board of Education and officials of the traction company, following the petition of the company for permission to abandon service between Ashville and Mayville. It was said at the time the proposed agreement was under consideration that it would not involve a withdrawal of the petition pending before the Public Service Commission for consent to abandon the line between Ashville and Mayville.

It is the intention of the agreement which the parties that are concerned now proposed entering into to maintain the most economical schedule possible. The agreement also provides that the school district will pay all deficit in actual operating expenses to the end that the Chautauqua Traction will not suffer any direct loss from such operation. This payment does not include any salaries for general offices, charges for depreciation, interest on investments or the funded or unfunded debts of the company, or any allowance or sums for accidents. The agreement will continue in force from month to month until canceled by one or the other party by ten days written notice. The present agreement is effective for 30 days from Jan. 11.

Reference to the proposed abandonment of the Mayville line was made in the *ELECTRIC RAILWAY JOURNAL*, issue of Dec. 19, 1925, p. 1094. At the hearing in Buffalo on Jan. 4 before the Public Service Commission George R. Raynor, principal of the Chautauqua High School, testified that there was 10.8 miles of the 13.4 that was proposed to be abandoned in the school district. He pleaded for a continuation of a service upon which 144 students were solely dependent. Later negotiations looking toward limited service were started.

## Fare Agreement in Spokane

New fares of 10 cents cash with five tickets for 35 cents were granted to the Spokane United Railways, Spokane, Wash., by the Department of Public Works of Washington at Olympia on Jan. 23, two days after a formal hearing at Olympia, where officials of the city of Spokane protested the increase. School tickets will remain at 50 for \$2. Transfers will remain free, but the age limit of children carried free is raised from four to five years. The new fare schedule will become effective on Feb. 1. It will replace a 7-cent cash fare with five tickets for 30 cents.

Fare discussion has been going on in Spokane since last October, when the company filed notice of increased rates. The company first sought a 10-cent cash rate with a ticket fare of thirteen for \$1. An agreement between the management of the railways

and the city resulted in a modification of this petition with the filing of a 10-cent cash fare and a 7-cent ticket rate.

## Zone Changes in Columbia

Consolidation of Nos. 1 and 3 fare zones of the Columbia Railway, Gas & Electric Company, Columbia, S. C., into a single zone is provided in an order recently issued by the South Carolina Railroad Commission. The order also extends the northern limits of Zone 1 by approximately eight blocks. The change was effective Jan. 10.

The fare zone system, designed by the Railroad Commission to increase if possible the company's revenues, was started on Dec. 16, but, according to reports recently made public, failed to produce the results desired. As was told in the *ELECTRIC RAILWAY JOURNAL*, issue of Dec. 26, 1925, page 1125, the commission divided the system into five zones with a 5-cent fare in each zone. The old fare had been 7 cents with 3 cents additional for transfers.

## Fewer Accidents in Los Angeles

On the lines of the Los Angeles Railway, Los Angeles, Cal., there were 3,050 fewer accidents in 1925 than in 1924 although more miles of street car service were operated. In 1925 there were 20,244 accidents, against 23,294 the previous year. According to *Two Bells*, the official paper of the Los Angeles Railway, the improvement was consistent throughout the year. Most of the accidents were caused by collisions of automobiles and street cars. There were 15,118 such accidents in 1925, compared with 16,799 in 1924. A reduction in collisions with pedestrians from 514 in 1924 to 325 in 1925 is attributed to the restriction of jay-walking in the downtown district.



## News Notes

**New Paper to Tell of Memphis Doings.**—Tri-Service News is the name of a new paper that has just been issued by the Memphis Power & Light Company and the Memphis Street Railway of Memphis, Tenn. It is a monthly and will deal primarily with the problems of the employees. The first issue carries a review of the development by the two companies during the past year and a statement of the program for 1926. Paul Renshaw, advertising manager of the companies, is editor.

**Pass System Continued.**—The Tacoma Railway & Power Company, Tacoma, Wash., has again been given an extension of its permit to continue the weekly pass system at \$1.25 a week, the permit covering the quarter ended April 25. Although the company has had the pass system in use for nearly four years, a portion of which time the passes sold for \$1 each, it has operated the system as a temporary proposition on quarterly permits from the State Department.

**Philadelphia Will Not Appeal Decision.**—The decision of the Public Service Commission in upholding the Philadelphia Rapid Transit Company's

petition for maintenance of the 7½-cent fare rate will not be appealed by the city. Mayor Kendrick of Philadelphia, Pa., made this fact known on Jan. 20. The Mayor defined the city's attitude shortly before he left City Hall with Charles B. Hall, president of the Council, and City Solicitor Gaffney to attend a Sesqui-Centennial meeting. Mr. Gaffney would not express any opinion until he had looked over the ruling.

**Election on Public Utility Control.**—The East St. Louis, Ill., City Council on Jan. 18 passed a resolution instructing the city counselor to circulate petitions for an election to determine whether the public utilities within the municipality should be placed under control of the city. A state statute provides for the assumption of such control by referendum vote. The action is being taken, the resolution states, as the result of numerous complaints made to the City Commission of unfavorable decisions by the State Commerce Commission.

**Referendum on Purchase Legal.**—A referendum on the proposal of the City Council of Seattle, Wash., to purchase the Seattle & Rainier Valley Railway is legal, according to a ruling of Corporation Counsel T. J. L. Kennedy. The question had been raised as to whether the residents of the entire city could sign petitions for a referendum vote on the purchase of the valley line. Mr. Kennedy said there was no such thing as a "regional referendum," claimed by some in favor of the purchase, who held that only the people of the valley were entitled to participate in a referendum. The railway purchase is being held up by a referendum petition being checked by Harry W. Carroll, City Comptroller.

**Railway Needs Help.**—At a meeting of the directors of the Chamber of Commerce at Owensboro, Ky., a committee was named to take steps to aid the Owensboro City Railroad. G. M. Millican, general manager, in a communication, reported that despite rigid economy, the company continued to lose money. The system has been in the hands of W. A. Carson, Evansville, as receiver since 1923. A saving has resulted, Mr. Millican reported, as a result of the city municipal plant supplying current for the operation of the cars. A 7-cent fare is charged.

**May Operate Mozart Line.**—The Wheeling Traction Company, Wheeling, W. Va., has been asked to take over the City Railway line in Wheeling to Mozart Hill, an agreement to that effect having been discussed at a meeting of the joint Council, a citizens' committee and officials of the traction company on Jan. 20. The Wheeling Traction Company stated it would consider the offer recently made by the committee provided the latter reconsiders the present traction franchises. Under the terms of the offer made by the city, the Wheeling Traction Company could operate the line for a period of three months and if during that time the service proves unprofitable the line could be returned to the city. If possible an appointed committee will effect a plan whereby all lines of the Wheeling Traction Company in the city of Wheeling can be operated under one franchise.

## Recent Bus Developments

### Discussion of Bus Renewed in Buffalo

H. H. Melville, president of the American National Omnibus Corporation, New York City, has assured Mayor Schwab and the City Council at Buffalo, N. Y., that the company will appear before the Public Service Commission at an early date to urge its case for the right to operate 5-cent bus lines in Buffalo. The company already has its franchise from the city for operating thirteen routes over 71.5 miles of streets.

He explained in a letter to municipal authorities that it was found that the manufacturing and financial capacity of the Gray Manufacturing Company, Detroit, was not equal to the requirements of the large amount of business under negotiation and accordingly new arrangements were made which has resulted in the organization of the American Bus & Truck Company, Inc. The assets of this company are more than \$3,500,000, of which \$900,000 is cash working capital, and which has no liabilities of any kind except its capital stock. This company is now completely organized and the plant at Springfield, Ohio, formerly owned by the Kelly-Springfield Truck Company, has been purchased and is in possession of the new company. In this connection it was necessary for the American National Omnibus Corporation to transfer its American rights in the Tilling-Stevens United States patents. This transfer was made in London last month and Ernest M. Howe, Detroit, who secured the Buffalo bus franchise, will return from England within a very short time with all details completed.

Associates in the new bus enterprise in Buffalo are William Schall of Schall & Company, New York; Gerard P. Tameling, Tameling, Keen & Company; Frank Hagemeyer and Charles P. Norcross, vice-president of O. J. Gude, outdoor advertisers.

There is much opposition to the institution of a 5-cent bus service in Buffalo by outside capitalists. The Buffalo Chamber of Commerce believes the move is made to discredit the International Railway Company and its subsidiary, the International Bus Corporation, which now operates three lines in the city. N. Loring Danforth, president of the Buffalo Chamber of Commerce, has sent a letter to the municipal authorities saying the new bus interests should show their good faith by filing their financing plan at once with the commission and take steps to bring about an early hearing on their application for a certificate of convenience and necessity from the state utilities board.

**Withdraws Request for Bus Extension.**—Withdrawal of its request for permission to operate buses as an extension of its car service along Summit View Road, between Walker Avenue inside the city limits of Yakima, Wash.,

to Englewood Avenue outside the city, has been filed by the Yakima Valley Transportation Company with the Department of Public Works. The withdrawal has been allowed.

### El Paso Supplies Rail-Bus Service to Lower Rio Grande Valley

An extensive rail-bus service to Clint, Ysleta, Fabens, Tornillo and other points in the Lower Rio Grande Valley, south and east from El Paso, Tex., is being supplied by the El Paso Electric Company. The combined service extends 45 miles east of El Paso. The interurban cars of the company run as far as Ascarate, which is 6 miles out of El Paso. At this point the transfer is made by passengers under a covered depot to the valley buses, incoming passengers to change at this station from the buses to the interurban cars and continue on into El Paso. The present interurban tracks from Ascarate to Ysleta, a distance of 7 miles, will be abandoned. It is said this will not occasion any inconvenience to former interurban passengers between these points as the bus service from Ascarate eastward is along a concrete highway which parallels the interurban.

The interurban cars in this service are painted a bright green with red roof and sash. The buses in this service are Reo, 20-passenger intercity type, with front entrance and exit door. They are painted gray with blue stripings and on the side of the buses are the words "Lower Valley King Cotton Express." The combined interurban and bus service started on Nov. 19, 1925, and it is believed will solve successfully the problem of adequate transportation service in the lower Rio Grande Valley.

In addition to its interurban service the company in December, 1925, passed an ordinance to supplement its railway service within the city of El Paso with buses.

### South Bend Company Seeks Three-Cents-a-Mile Bus Fare

The Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., has petitioned the Public Service Commission of Indiana for an increase of  $\frac{1}{2}$  cent a mile in the basic rate of fares on the intercity buses. Fares on bus lines within the city of South Bend would not be affected. The intercity buses operate between South Bend and the Indiana Michigan state line and from South Bend to Goshen, through Mishawaka, Elkhart and to Laporte. The company cites figures showing that between Oct. 10 and Dec. 31, 1925, a loss of \$7,228 was incurred as a result of the present rate of 2 $\frac{1}{2}$  cents.

Since October, 1925, the basic rate per mile as approved by the Public Service Commission has been 2 $\frac{1}{2}$  cents, with a 25 per cent reduction for commutation tickets. All passengers paid

per mile. The present petition would establish 5-cent zones for short hauls, with a minimum fare of 10 cents. Under the proposed plan twelve commutation tickets would be sold for \$1 and a \$5 coupon book for \$3.75.

The petition states that if a safe, efficient and dependable service is to be given and taxes paid an increase in the basic rate of fare, must be allowed. Officials of the company claim that the  $\frac{1}{2}$ -cent per mile increase sought would be sufficient to care for both operating expenses and returns on the investment. The rate war which was conducted between competing companies is generally blamed for the fact that revenues failed to meet expenses. This dissension some months ago caused several smaller bus companies to go out of business, but the Jahns bus lines and the interurban company made an agreement whereby part of the service offered by each was rearranged.

**New Line Lowers School Fare.**—The Public Service Commission has approved as of Jan. 18 the establishment of a new bus line by the Utica Railway Co-ordinated Bus Line, Inc., beginning at Genesee Street and Main Street, in Utica, and extending to Clark Mills. Fares for pupils attending day schools are 10 cents where regular fare is 15 cents or 20 cents; 15 cents where regular fare is 25 cents or 30 cents; 20 cents where regular fare is 35 cents. Minimum fare between any two stops is 10 cents.

**Permission to Run Buses.**—The Council of Salamanca, N. Y., has granted the Olean, Bradford & Salamanca Bus Lines, a subsidiary of the Olean, Bradford & Salamanca Railway, a franchise to run between Salamanca and Little Valley and the Allegany State Park.

**Buses May Supplant Four-Mile Line.**—The Denver & South Platte Railway, operating between Englewood and Littleton, Col., a distance of about 4 miles, has organized the Denver & South Platte Transportation Company as its subsidiary. The subsidiary specifies buses, and if it can get a permit for the buses and permission to substitute them for the tramway operation of the railway will be abandoned. Travel over the line is light. Connection is made by the Denver Tramway at Englewood.

**Service in Portland Extended.**—The Portland Electric Power Company has added another bus line to its supplementary service in Portland, Ore. This is to be known as the Powell Valley Road line and will operate in the vicinity of Powell Valley Road over East 82d Street to Kendall station.

**Will Supplement Rail Service with Bus.**—The Asheville Power & Light Company, Asheville, N. C., will supplement its railway service between West Asheville and the main business district of the city with two eighteen-passenger buses on a fifteen-minute schedule. The fare will be 10 cents with no transfer privileges. The company for some time past has been maintaining a bus service to the end of the street car line in West Asheville, carrying passengers as far as the entrance to Sulphur Springs on a half-hour schedule. The new service is expected to be of benefit to the West Asheville residents.



# Financial and Corporate

## Radial Troubles Explained

Toronto Paper Resents Statements Made in Recent Issue of "Tulley Talks"

As the Toronto *Daily Star* sees it, the two greatest problems which Toronto faces to-day are the deficits on its harbor and the deficits on its radial railways. That authority says the annual deficit on the radials is due chiefly to an obvious and curable cause—their operation as isolated units by a commission which has nothing whatever to do with the city system in which they would naturally center. The *Star* says that if the radials had been operated in 1924 at T. T. C. costs there would have been a saving of \$255,000 to offset the reported deficit of \$248,000. It was on the basis of such facts that Mr. Cameron sought election to the mayoralty on a straight platform of T. T. C. operation. The *Star* said that a vote for Cameron as Mayor and for Gibbons, McBride, Whetter and Robbins as controllers was a vote to stop the radial deficits by giving the radials to the T. T. C. to operate.

Incidentally, that paper was led into a general discussion of the whole matter as a result of a quotation in the *ELECTRIC RAILWAY JOURNAL* from a recent issue of "Tulley Talks," published by Mitten Management, Inc., at Buffalo. The statement by Mr. Tulley said:

Toronto, under municipal operation, concerning which much has been said as to the kind of service and the cheapness of the fare, is also proving a disappointment in that the taxpayers are already being called upon to pay large sums of money to make up for the losses sustained in carrying the people at less than actual cost.

The fact is that outside the city Toronto owns the York radials. These lines are operated for Toronto by the provincial Hydro commission at an annual loss to the taxpayers of nearly \$250,000. Inside the city Toronto owns the whole street railway system. It is operated for Toronto by the Toronto Transportation Commission without the loss of a dollar to the taxpayers. The *Star* says that in efficiency of service and in financial soundness it is a splendid advertisement for public ownership, but that the advertisement is marred by the failure of the radials. Here's how the *Star* explains the matter:

The losses made by the radials under provincial Hydro management are attributed to the city system under T.T.C. management. It is an unwarranted reflection on the T.T.C., which has never yet operated at a loss. But if the garbled statement is a reflection on the T.T.C., the truth is a reflection on the Hydro, and public ownership again suffers. It suffers unnecessarily. For the deficits arise from an unnecessary condition. No management could make the three radials pay when they are separated from the city system and from each other, with consequent quadruplication of equipment, barns, yards and shops, and absence of a "through" service to the center of the city. But by giving the radials to the T.T.C. to operate, all these disadvantages disappear, and the deficits disappear with them.

Operation of the Toronto-owned radials by the Toronto Transportation Commission will therefore have the following beneficial effects:

1. It will take a burden of \$250,000 a year off the shoulders of the Toronto taxpayers.
2. It will relieve the Hydro of the discredit of operating radials at a loss.
3. It will relieve public ownership of this reproach. In fact, it will strengthen public ownership. For the T.T.C. will wipe out the deficits.
4. It will give radial users and radial express a "through" service to and from the center of Toronto, and Toronto and the surrounding country will profit by the trade thus developed.
5. The T.T.C. will profit by the rentals charged the radials for use of tracks, barns, etc., within the city, while the radials will profit by paying only once for these, instead of paying for duplicated and triplicated facilities.

## San Francisco Municipal Loss \$305,162

For Year Ended June 30, 1925, the Excess of Income Over Operating Expenses, Interest, Depreciation and Accident Reserves Was \$6,385, but Taxes and Similar Charges Amounted to \$311,548

**T**OTAL revenue of the Municipal Railway, San Francisco, Cal., for the year ended June 30, 1925, was \$3,281,498. Interest on securities owned increased this by \$44,595, to \$3,326,093. Deducting operating expenses of \$2,544,720 left net of \$781,372. Against this \$186,678 was charged for interest on funded debt and \$588,308 for reserve for depreciation and for accidents, leaving a balance of \$6,385, compared with \$8,374 for the previous year.

For the purpose of securing a comparison between the results of operation of the municipally owned utility and similar utilities operated by pri-

## Sale of Ohio Properties Approved

Sale of the properties of the Cincinnati & Dayton Traction Company, including the main line from Cincinnati to Dayton and the Hamilton city lines, now in the hands of George P. Sohngen, receiver, has been approved by the Court of Appeals at Hamilton, Ohio. The receiver has been ordered by the court to pay all claims against the company so as to facilitate the sale. The receiver holds cash and securities amounting to \$777,067.

A reorganization plan has been approved and adopted by the protective committee representing the holders of the first and consolidated mortgage 5 per cent bonds of the Southern Ohio Traction Company and the holders of the first 6's of the Cincinnati & Hamilton Street Railway, included in the Cincinnati & Dayton system.

vate capital, the charter of the city and county of San Francisco provides that the operating reports shall include certain comparison charges consisting of items which constitute part of the actual cost of operating privately owned companies, but which the municipally owned utility is not required to pay. For the year these charges amount to \$311,548, leaving a net loss of \$305,162. This compares with a similar deficit of \$295,230 for the previous year.

There has been a continuing deficit, as shown by the cumulative income account for the period from Dec. 28, 1912, to June 30, 1925, amounting to

COMPARATIVE INCOME ACCOUNT, SAN FRANCISCO MUNICIPAL RAILWAY

	—Year Ended June 30—		Dec. 28, 1912
	1924	1925	to June 30, 1925
Passenger revenue.....	\$3,173,181	\$3,268,383	\$28,683,573
Miscellaneous revenue.....	16,352	13,115	123,470
<b>Total revenue.....</b>	<b>\$3,189,533</b>	<b>\$3,281,498</b>	<b>\$28,807,043</b>
Interest on securities owned.....	46,519	44,595	361,269
<b>Total income.....</b>	<b>\$3,236,052</b>	<b>\$3,326,093</b>	<b>\$29,168,313</b>
<b>Operating expenses:</b>			
Way and structures.....	\$115,467	\$115,073	\$914,993
Equipment.....	187,635	197,619	1,693,105
Power.....	465,889	464,990	3,834,695
Conducting transportation.....	1,523,269	1,600,499	12,600,619
Traffic.....	109	.....	3,836
General and miscellaneous.....	167,910	166,333	1,130,702
Loss on road retired.....	.....	.....	8,184
<b>Total operating expenses.....</b>	<b>\$2,460,282</b>	<b>\$2,544,515</b>	<b>\$20,186,138</b>
<b>Other deductions:</b>			
Taxes—Motor bus.....	.....	205	205
<b>Total operating expenses.....</b>	<b>\$2,460,282</b>	<b>\$2,544,720</b>	<b>\$20,186,343</b>
<b>Excess of income over operating expense.....</b>	<b>\$775,770</b>	<b>\$781,372</b>	<b>\$8,981,969</b>
Less: Interest on funded debt.....	196,223	186,678	2,561,640
<b>Excess of income over operating expenses and interest.....</b>	<b>\$579,546</b>	<b>\$594,694</b>	<b>\$6,420,328</b>
Less: Reserve for depreciation and accidents (18 per cent of gross earnings).....	571,172	588,308	5,162,145
<b>Excess of income over operating expenses, interest, depreciation and accident reserves.....</b>	<b>\$8,374</b>	<b>\$6,385</b>	<b>\$1,258,183</b>
Less: Charter comparison charges.....	303,604	311,548	2,587,732
<b>Net loss.....</b>	<b>\$295,230</b>	<b>\$305,162</b>	<b>\$1,329,548</b>
<b>Analysis of Comparison Charges:</b>			
*State franchise tax—4 1/2 per cent of gross earnings.....	\$167,442	\$172,279	\$1,510,832
†Municipal franchise tax—3 per cent of gross earnings.....	126,927	130,735	954,893
Municipal car license.....	3,135	3,135	33,393
Federal income tax.....	.....	.....	13,270
Salary of clerks.....	.....	.....	4,872
Law expenses.....	.....	.....	13,500
Insurance.....	6,099	5,398	56,969
<b>Total.....</b>	<b>\$303,604</b>	<b>\$311,548</b>	<b>\$2,587,732</b>

\*State franchise tax percentage has varied in different years. †Municipal franchise tax now increased to 4 per cent. *Italics* indicate loss or deficiency.

STATISTICAL DATA, SAN FRANCISCO MUNICIPAL RAILWAY, FISCAL YEAR ENDED JUNE 30, 1925

	Total Amount	Per Car-Mile	Per Car-Hour
Total passenger revenue.....	\$3,268,383.23	\$0.3673	\$3.5477
Total operating expense (taxes and depreciation not included)...	2,544,515.59	0.2860	2.7619
Total operating earnings (taxes and depreciation not included)	723,867.64	0.0813	0.7858
Ratio of earnings to passenger revenue.....	0.2215		
Total taxes and charter charges.....	311,753.11	0.0350	0.3384
Ratio to passenger revenue.....	0.0954		
* Depreciation.....	588,308.97	0.0661	0.6386
Ratio to passenger revenue.....	0.1800		
Operating expenses, depreciation and taxes.....	3,444,577.67	0.3871	3.7389
Ratio to passenger revenue.....	1.0539		
Net deficit from operation.....	176,194.44	0.0193	0.1912
Ratio to passenger revenue.....	0.0539		
§ Passenger car mileage.....	8,897,271		
† Passenger car-hours.....	921,280		
Platform expense (6½ cents per hour; time and one-half for over-time after eight hours, and after ten hours range; time and one-half for seventh day work; twelve days vacation per year with pay). Bus operators, 7½ cents per hour; same conditions as platform men.....	1,332,652.65		

Number of passenger cars owned.....	209	Free passengers (employees, etc.).....	618,830
Number of work cars owned.....	6	Total passengers carried.....	79,900,645
Total number of cars owned.....	215	Number of passengers carried per car-mile	8.98
Total number of buses owned.....	10		
Total number of cars and buses owned.....	225		
Passengers carried—5-cent fares.....	64,783,403		
5-cent fares—Government tickets.....	43,952		
2½-cent fares—School tickets.....	1,009,735		
½-cent revenue transfers.....	302,016		
Free transfers.....	13,142,709		

\* The sum of \$201,000 expended from depreciation reserve funds for bond retirement.  
 † Includes mileage of buses.  
 ‡ Includes car-hours of buses.  
 § Transfers lifted at Filmore and Union Streets, treated as revenue transfers pending result of present crossing litigation.  
 †† Indicates loss or deficiency.

\$1,329,548 when the comparison charges are included. Omitting these from consideration, there has been an excess of income over operating expenses, interest, depreciation and accident reserves of \$1,258,183.

As in previous reports, particular attention is given to the explanation of the items in the balance sheet, which is reproduced in condensed form herewith. Capital assets consist of road and equipment, \$7,992,410, and general expenditures, \$324,872. Thus the total cost of road and equipment was placed at \$8,317,283. Current assets consist of \$943,517 of securities bought for the depreciation fund, \$15,185 in accounts receivable and \$153,523 for materials and supplies. The item of deferred assets, some \$132,123, did not change during the year. Thus the total of assets was \$10,595,543. On the liability side the funded debt item represents the par value of bonds outstanding in the hands of the public on June 30, 1925. Current liabilities include accounts and vouchers payable, \$339,763, and interest due on funded debt, \$44,231. The reserves include a reserve for depreciation of \$1,373,288 and a reserve for compensation insurance of \$102,855.

The Municipal Railway has no capital stock and the excess of its assets over its liabilities represent surplus. In a

preparation of a balance sheet this surplus has been divided into two classes: First, that which was created by donations or contributions, and, second, that which has accumulated from the earnings resulting from the operation of the road. The contributed surplus includes premiums from the sale of bonds, \$26,000, and contributions from general taxes, \$306,552. In surplus from income is included \$1,791,000, representing the income which has actually been set aside for the redemption of bonds. Of this amount the item of \$1,690,000 rep-

COMPARATIVE CONDENSED GENERAL BALANCE SHEET, SAN FRANCISCO MUNICIPAL RAILWAY, AS OF JUNE 30, 1925

Assets	1925	1924	Increase or Decrease
Capital assets.....	\$8,317,283	\$7,912,526	\$404,756
Current assets.....	2,146,137	2,174,925	28,788
Deferred assets.....	132,124	132,124	.....
Total assets.....	\$10,595,544	\$10,219,576	\$375,968
Liabilities, Reserves and Surplus:			
Funded debt.....	\$3,791,000	\$3,992,000	\$201,000
Current liabilities.....	383,996	269,720	114,275
Reserves.....	1,476,144	1,568,470	92,326
Contributed surplus.....	332,553	332,553	.....
Surplus from income.....	4,611,852	4,056,833	555,019
Total surplus.....	\$4,944,405	\$4,389,386	\$555,019
Total liabilities, reserves and surplus.....	\$10,595,544	\$10,219,576	\$375,968

Italics indicate loss or deficiency.

STATEMENT OF BUS LINE OPERATIONS, SAN FRANCISCO MUNICIPAL RAILWAY, YEAR ENDED JUNE 30, 1925

Revenues:	
Passenger earnings.....	\$40,765
Q. M. tickets.....	6
School tickets.....	771
Local transfers.....	13,628
Total revenues.....	\$55,172
Operating expenses:	
Repairs to buses.....	\$9,385
Tire expense.....	8,236
Garage expense.....	18,155
Conductors and chauffeurs.....	27,742
Depreciation (18 per cent of receipts).....	7,337
Compensation insurance.....	1,097
Motor bus tax.....	205
Total operating expenses.....	72,160
Net loss for year.....	\$16,987
Average net loss per day.....	46.54

resents bonds redeemed and canceled and the item of \$101,000 was cash.

An item of considerable interest to railway operators is the charter reserve of \$1,119,471 for insurance and taxes. As explained previously, there are set aside certain sums for comparison with private operation, of which this item is a part. The municipal system not having to pay any of these charges, the receipts from operations were deposited in the operating cash fund without any restrictions as to how they were to be used. As a matter of fact, most of the cash in the operating fund, represented by such comparison charges, was actually expended in new construction and

addition and betterment work, so that these reserves representing obligatory comparison charges have in reality been used as reserves for betterments. For the purpose of making the balance sheet reflect the actual results of operations, the amount expended in addition and betterment work has been reflected in an account entitled "Additions and Betterments from Income," and the charter reserves for insurance and taxes carry a balance equal only to the unused portion of the original reserves.

The amount included in the additions and betterment account is \$2,651,573. This account represents the value of construction and addition and betterment work performed out of the funds derived from the operation of the road.

Operating surplus of the San Francisco Municipal Railway is made up as:

Operating surplus.....	\$1,052,316
The following is an analysis of the above figure:	
Surplus June 30, 1924.....	\$768,481
Add: Transfers from depreciation fund to operating fund to cover deficits in the latter.....	74,093
	\$842,574
Deduct: Amount transferred from income account.....	\$694,398
Interest on securities credited to income but deposited in depreciation fund.....	44,595
Internal revenue tax on motor buses for hire for years 1920 to 1924.....	820
Adjustment—Replacing cable in Twin Peaks Tunnel.....	7,351
	357,929
Total.....	\$1,052,316
Total surplus from income.....	\$4,611,851
The total surplus derived from the operations of the road is as follows:	
Bonds retired through income.....	\$1,690,000
Reserve for bond redemption.....	101,000
Advance general fund—Twin Peaks Tunnel.....	82,152
Advance general fund—Stockton Street Tunnel.....	48,971
Advance general fund—Ocean Shore Railroad switching.....	1,000
Charter reserves.....	1,119,471
Additions and betterments from income.....	2,621,573
Operating surplus.....	1,052,316
Total.....	\$4,611,851

The net loss on bus operation was \$16,987, compared with \$19,861 for the previous year. These figures, however, do not include any supervision or other overhead or comparison charges.

The total single track mileage as of June 30, 1925, was 69.40. The total bus route mileage as of that date was 5.42.

Indianapolis Property Reported in New Insull Deal

Announcement was made at Chicago on Jan. 27 of an impending deal which will bring under Insull control the Terre Haute, Indianapolis & Eastern Traction Company, including the Indianapolis Street Railway. These properties will be merged with the Central Indiana Power Company. Mr. Insull was reported to have said that the interests he represented were not going into the consolidation primarily from the traction point of view, but that with their traction lines in northern Indiana and the Interstate Public Service Company's line from Indianapolis to Louisville closer traction relations were certain, with through interurban service possible from Chicago to Louisville.

## Atlanta Company in Southeastern System

Individual shareholders owning substantially more than a majority of the total outstanding common capital stock of the Georgia Railway & Power Company, Atlanta, Ga., have agreed to accept in exchange therefor 1,633 shares of cumulative participating preferred stock and one share of non-par value common stock of the Southeastern Power & Light Company for each share of Georgia Railway & Power Company common stock owned by them. When completed this exchange will bring under centralized, unified and co-ordinated ownership and management the Alabama Power Company (a subsidiary of Southeastern Power & Light Company) and the Georgia Railway & Power Company.

The Alabama Power Company and Georgia Railway & Power Company will continue as individual operating companies, with their own organizations and management, under the local state laws, maintaining their own financial structures and subject to public regulations as to rates and security issues within the respective states served. The present policies and management of the Georgia Railway & Power Company will continue. No change in the organization personnel is contemplated.

The agreement reached will make possible more effective and continuous use of present operating water power and steam plants, and will result in future co-operative development of water power in the various water sheds of Georgia and Alabama.

In addition auxiliary steam power generated to the extent necessary at the mouth of the Alabama coal mines will be connected by wire with and made available throughout the territory served, a condition of great economic and industrial advantage.

## Milwaukee Company Calls 8 per Cent Issue

The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., has called for payment on March 1 the \$3,000,000 of 8 per cent preferred stock sold by it locally to its customers in 1921. Holders have the option of turning in the stock on March 1, on which date the dividend is payable, and receiving their principal and a bonus of \$3 a share or of receiving in lieu of the 8 per cent stock a similar amount of the company's 7 per cent issue. It would appear from the terms of the offer of exchange that an additional amount of the 7 per cent stock is shortly to be issued.

The company will reduce its funded debt by \$6,500,000 on Feb. 1 by the payment of its consolidated first mortgage bonds due on that date. This maturity will be met without the issuance of any new bonds. The cash required will be provided by the issuance and sale of \$3,750,000 additional common stock and by local sales of preferred stock, and, to such extent as may be necessary, by cash advances by the parent North American Company. Upon the retirement of this issue, only

about 57 per cent of the company's total capitalization will be represented by mortgage bonds and the value of the company's property will be more than double the amount of all mortgage bonds outstanding.

## Interurban Offers a \$5,000,000 Issue

Changes in the financial structure of the Chicago, Aurora & Elgin Railroad, Aurora, Ill., were made public on Jan. 27 with the announcement of an offering by Halsey, Stuart & Company, Inc., of an issue of \$5,000,000 first and re-funding mortgage 6 per cent bonds, at 96 and interest, yielding more than 6.30 per cent. Part of the proceeds will be used to refund the \$750,000 of 6½ per cent notes due next December, the \$1,050,000 bonds due in 1947, and also for the purchase of approximately \$2,000,000 of first mortgage 5 per cent bonds due in 1941. This will place the company in an unusually strong position.

As part of the plan the Chicago, Aurora & Elgin Railroad will be incorporated in Illinois as successor by consolidation to the present company of the same name. The company will own 103 miles of line, measured as single track. For the twelve months period ended Nov. 30, 1925, gross revenue of the company was \$2,699,900. Net earnings during the same period before depreciation were \$665,734, as compared with the annual interest of \$310,150 on the company's funded debt to be outstanding in the hands of the public upon completion of this financing.

## Protective Committees for Chicago Street Railways

Plans are fast being perfected to protect the holders of securities of companies embraced in the system of the Chicago Surface Lines. Early in February Leonard A. Busby, president of the Chicago City Railway, stated before the City Council transportation committee that protective committees of security holders were being formed. Now Frank O. Wetmore, chairman of the board of the First National Bank, bankers for the South Side lines, says that the personnel of the committees will be made known soon. It is known that four committees are being organized, of which the two principal committees will be these:

First—For the protection of \$60,000,000 underlying bonds of the Chicago Railways Company; chairman, A. W. Harris, Harris Trust Company.

Second—For the protection of the \$40,000,000 underlying bonds of the Chicago City Railway and the Calumet & Southern; chairman, Frank O. Wetmore, First National Bank.

A third committee will protect the junior securities of the Chicago City & Connecting Railways; chairman B. E. Sunny.

That leaves one committee to be formed—the committee to protect the securities of the West Side properties.

Prior to the consolidation of the properties in 1907 the Chicago City Railway had no bonded indebtedness, and the only securities outstanding were \$18,000,000 in stock. Of this amount the Morgan house bought shares having a par value of \$17,000,000.

## \$457,109 Surplus for Interborough for Six Months

For the six months ended Dec. 31, 1925, the total revenue of the Interborough Rapid Transit Company, New York, N. Y., from all sources was \$30,167,690, an increase of \$1,614,977 over the corresponding period of 1924. This increase is largely accounted for by the receipt in July, 1925, of a cash payment of \$770,000 as part consideration for the new advertising contract, which became effective Nov. 1, 1925. There was no similar payment in the previous year. Operating expenses, taxes and rentals paid to the city for the old subway increased \$766,855. Income deductions increased \$142,496. The net result for the six months was a surplus of \$457,109. This represented an improvement of \$705,625 compared with the corresponding period of 1924, due chiefly to the new advertising contract.

## Conestoga Traction Properties in Deal

Purchase of control of the Lancaster County Railway & Light Company, Lancaster, Pa., and of the Harrisburg Electric Light Company, Harrisburg, Pa., is announced by the Lehigh Power Securities Company. Included in the deal are 162 miles of electric railway operated by the Conestoga Traction Company, the common stock of which is owned by the Lancaster County Railway & Light Company.

The Lehigh Power Securities Corporation has sold to bankers an issue of \$25,000,000 of 6 per cent gold debentures, series A, due Feb. 1, 1926, the proceeds to be used to retire \$7,566,000 outstanding Lehigh Power ten-year 6 per cent secured gold notes, to finance the purchase of the new properties and other purposes. The United Gas & Electric Corporation is to receive for the Lancaster and Harrisburg properties Lehigh Power's present outstanding issue of \$13,000,000 of \$6 cumulative preferred \$100 par stock and about \$10,000,000 in cash.

After disposal of the properties the United Gas & Electric Corporation is to be absorbed by the Empire Power Corporation.

## Preliminary Figures at Grand Rapids

E. J. Bechtel, New York, was elected a director and a vice-president of the Grand Rapids Railway, Grand Rapids, Mich., at the annual meeting on Jan. 26. Other directors and officers were re-elected. The annual report, as furnished the city, showed total earnings for 1925, including miscellaneous items, of \$1,738,779 a decrease of \$32,553 compared with total receipts for 1924. Operating expenses were \$1,172,157, an increase of \$72,982 compared with 1924 and largely due to rental of cars by the company because of stock destroyed in the fire at the Hall Street carhouse and to high maintenance charges.

Arrival of 27 new cars about April 1 is expected to improve the situation. The number of revenue passengers carried during 1925 was 23,947,305 or a decrease of 877,713 compared with 1924.

## Personal Items

### F. J. Linforth Promoted

Superintendent of Employment at San Francisco Made Assistant to General Manager

Frank J. Linforth, superintendent of employment and training of the Market Street Railway, San Francisco, Cal., has been appointed assistant to M. McCants, general manager of that company.

Much of the success of the company's personnel policy is attributed to Mr. Linforth's close application to the solution of this problem. Each section of the country has problems that are largely its own in this matter, but so far as the Market Street Railway is concerned it has succeeded in cutting down labor turnover materially. The complete picture in figures cannot be



F. J. Linforth

given here, but since Mr. Linforth became inspector of applicants in 1910 more than 18,000 men have passed through his hands, so to speak. For the last three years all the men hired have taken a training course. Perhaps still more to the point in some respects is the fact that at the start of the new system of training in 1923 the probationer's examination was taken voluntarily by all motormen and conductors.

But there is another angle to the matter. Mr. Linforth has edited the company's magazine, the *Inside Track*, since its inception in March, 1922. He will continue in his capacity of editor. This is good news for the men and women of the company, for he has made the *Inside Track* one of the very best of its kind. That publication is edited in a way that indicates keen insight on the part of the editor into the needs of the men and women of the system, shows rare good taste and reflects a humanitarianism based on wide contact with men and events over a long period of years.

Mr. Linforth entered the employ of the Market Street Railway as a conductor in September, 1908. In June, 1910, he was detailed to the Turk and Fillmore office as night clerk and was in succession day clerk, investigator and

inspector of applicants in the employment department. In July, 1923, he was appointed superintendent of employment and training.

Before going to the Market Street Railway he had been a captain of constabulary in the Philippine Islands. He went to the Philippines as a volunteer during the Spanish-American War. He was educated at Notre Dame University.

### J. P. Dick and C. E. Bennett Promoted in Atlanta

Jackson P. Dick, formerly assistant to the vice-president and general manager of the Georgia Railway & Power Company, Atlanta, Ga., has been promoted to assistant general manager.

Mr. Dick has been with the Georgia Railway & Power Company since 1919 as purchasing agent for the department of development and shortly thereafter was made purchasing agent for the entire company. In July, 1924, he was promoted to assistant to the vice-president and general manager. This position he has held up to Jan. 1, 1926, when he was made assistant general manager. Mr. Dick was graduated from the University of Georgia in 1908. At one time he was connected with the Texas Company.

C. E. Bennett, electrical engineer, has been appointed manager of the company's electrical department.

### G. S. Davison New President of A.S.C.E.

George S. Davison has been elected president of the American Society of Civil Engineers for the year 1926. He is well known in electric railway and in rapid transit circles. Back in 1897 Mr. Davison became chief engineer of the Monongahela Street Railway System, which operated 70 miles of track in Pittsburgh and neighboring communities. He built the Pittsburgh & Charleroi Street Railway. In 1901 he became the general manager and director of the Pittsburgh & Birmingham Traction Company, serving the section of Pittsburgh south of the Monongahela River. In 1905 and 1906 he directed the construction of the Allegheny Valley Street Railway from Aspinwall along the Allegheny River to Natrona. In a consulting capacity he investigated and reported upon many interurban street railways for financial purposes.

Mr. Davison was born in the Lawrenceville section of the city of Pittsburgh in 1856. He was graduated from the Rensselaer Polytechnic Institute at Troy, N. Y., in 1878, with the degree of civil engineer. At the present time he is a member of the Planning Commission of the city of Pittsburgh and chairman of the Transit Commission of the city of Pittsburgh. He has been a member of the American Society of Civil Engineers since 1890. He served it as a director and vice-president previous to his election as president.

### W. C. Campbell in New Post

Duties of Tennessee Official Widened and More Closely Defined—Man of Wide Experience

W. C. Campbell, formerly assistant to B. C. Edgar, new president of the Tennessee Electric Power Company and the Nashville Railway & Light Company, was placed in charge of all operations in the communities outside of Chattanooga and Nashville, effective Jan. 1. The position is a new one and comes as a result of the continual expansion of the company's business throughout middle and eastern Tennessee.

The new executive has been associated with various branches of the public utility business for the past 25 years. Early in his career he served a year and a half in the test department of the General Electric Company at Schenectady, and was sent by this concern to New York City to supervise the installation of car equipment for the New York subways. With the ex-



W. C. Campbell

ception of one year spent as general carhouse foreman of the New York Railways, he remained in New York City with the General Electric Company until 1909, going from there to the Pacific Coast for construction, engineering and sales work.

In 1914 he left the General Electric Company and returned East to become assistant general superintendent of the Columbus Railway, Power & Light Company, Columbus, Ohio. He became general superintendent in 1918. It is at this point that Mr. Campbell recalls to mind the Campbell-Clapp combination. H. W. Clapp, another engineer executive, was promoted to the general management of the Columbus property at the time that Mr. Campbell succeeded to the post of general superintendent, previously occupied by Mr. Clapp. The careers of both men were reviewed in the *ELECTRIC RAILWAY JOURNAL* of Dec. 28, 1918. It was said at that time that both Mr. Campbell and Mr. Clapp would retain their interest in electrical engineering matters. It was also said that their experience demonstrated that engineering training need not prove a bar to general administrative work if a man has a talent for such.

One year later Mr. Campbell went to Chattanooga, Tenn., as assistant to B. C.

Edgar, then vice-president and general manager. He has had charge of all rate matters for the company, insurance and other duties, which he will continue to supervise.

Mr. Campbell is a native of Kentucky. He was graduated from Union College, Schenectady, N. Y., in 1900 and took an additional year of engineering at Purdue University.

### P. R. T. Real Estate Manager to Retire

J. A. Patterson, for many years real estate representative of Mitten Management and of the Philadelphia Rapid Transit Company, Philadelphia, Pa., will retire from active service July 1, 1926.

Mr. Patterson, with long experience and observation in the earlier days of transportation development in Philadelphia, has been one of the warmest advocates of co-operation as typified by Mitten Management. His participation with the P. R. T. and Mitten Management will be less active, but they will still have the benefit of his counsel and encouragement.

Albert M. Greenfield & Company, which negotiated the purchase of the Frankford, Tacony & Holmesburg Street Railway by the Philadelphia Rapid Transit will succeed Mr. Patterson.

### Ernest Stenger Heads Denver Water Board

Ernest Stenger, who piloted the Denver Tramway, Denver, Col., through receivership and was elected president of the Tramway when it was reorganized, has been selected by Mayor Stapleton to head the Denver Water Board. The position will in no way interfere with his duties as president of the tramway, but is in itself a great honor. The newspapers and citizens were insistent that the Mayor get a man to head the water board who would improve conditions. Mr. Stenger is a degree man in civil engineering from the University of Michigan, has served the Denver & Rio Grande Railroad as a general superintendent, the Union Pacific Railroad as superintendent and is known as a builder.

### R. W. Lamar Chief Engineer at Birmingham

Robert W. Lamar has recently been appointed chief engineer of the Birmingham Electric Company, Birmingham, Ala. In this capacity he fills the vacancy caused by the appointment of H. E. Cox to the position of assistant general manager. This appointment was referred to in the *ELECTRIC RAILWAY JOURNAL*, issue of Nov. 14, 1925, page 887. Mr. Lamar has had broad experience in engineering and utility business in the western and central states. He has been connected with the J. G. White Management Corporation and for several years with the Electric Bond & Share Company of New York, and affiliated companies. During the World War he was captain of engineers in the United States Army. Mr. Lamar was born in Indiana. He was graduated from Washington University, St. Louis.

## Washington Bus Personnel

Messrs. Merrill and Shapiro Will Operate New North American Subsidiary in Nation's Capital

New officials in the persons of E. D. Merrill and Alexander Shapiro have been named to fill the posts of president and general manager and of assistant general manager respectively of the Washington Rapid Transit Company, a bus company of Washington, D. C. An announcement to this effect was recently made by F. W. Doolittle, vice-president of the North American Company, for whose interest the properties of the former company were recently acquired.

Both appointees are well known in the railway field. For the past two years Mr. Merrill has been traffic engineer for the Chicago Motor Coach Company and the Yellow Coach Manufacturing Company. Back in 1909 he joined the Union Pacific Railroad as assistant engineer, remaining with that road until 1913. A year later he joined the Puget Sound Traction Light & Power Company, Seattle. When he resigned from that organization in 1919 he was traffic engineer. Later he was identified with the Milwaukee Electric Railway & Light Company, a subsidiary of the North American Company, and became assistant superintendent of transportation. From 1920 to 1922 he was with the Philadelphia Rapid Transit Company as traffic engineer and assistant superintendent of transportation. During 1923 he was assigned to special study work for the Boston Elevated Railway, following which he joined the Cincinnati Traction Company as superintendent of schedules. In 1924 he lined up with the Chicago organization.

Mr. Merrill was graduated from the Massachusetts Institute of Technology in 1909.

Mr. Shapiro, who will assist Mr. Merrill in conducting the operation of the Washington Rapid Transit Company, recently went to Washington to make a survey of the lines of that company. At that time he held the position of commercial manager of the Wisconsin Motor Bus Lines, affiliated with the Milwaukee Electric Railway & Light Company, Milwaukee, Wis. Mr. Shapiro has long been identified with the North American Company. Back in 1922, when the bus operations of the Milwaukee Electric Railway & Light Company, expanded so rapidly that a reliable man was needed to supervise their operations, he was chosen, along with Sylvester Henningfeld. At that time he was statistician and assistant in the executive department of the Milwaukee company. In 1914 Mr. Shapiro joined the staff of the American Electric Railway Association as assistant in the bureau of fare research. He was later retained by the association as assistant statistician and for more than a year was in charge of the association's bureau of statistics and information. In 1919 he was retained by the Committee of One Hundred of the association on work in connection with the Federal Electric Railways Commission investigation. He went to Milwaukee in the spring of 1920 as statistician in the executive department. Later he became interested in operating work

and for nearly a year acted as secretary of the company's transportation committee, which passes on all problems arising out of the operation of the company's railway and bus utilities.

Mr. Shapiro was graduated from the College of the City of New York, where he received his preliminary engineering training and where he specialized in statistics, economics and accounting.

### Appointment of R. V. Taylor to I.C.C. Reported Favorably

The Senate interstate commerce committee has decided to report favorably the nomination of R. V. Taylor of Alabama to the Interstate Commerce Commission.

An official poll of the interstate commerce committee was declared on Jan. 26 to show nine votes to eight of the Senate for a favorable report on the nomination of Thomas F. Woodlock, New York, who now holds a recess appointment on the Interstate Commerce Commission. After the committee has reported, leaders said, a poll of the Senate would be made, and should it show a majority against the nomination the wishes of President Coolidge would be consulted.

### Roy C. Cram Resigns from Brooklyn Company

Roy C. Cram has resigned from the Brooklyn-Manhattan Transit Corporation, with which he has been connected since 1912. At present he is engaged on a special assignment connected with one of the railways in the metropolitan district, but he has not yet fully matured his plans for the future. The new work and some personal matters on which he is engaged, by their very nature, have made it impossible for Mr. Cram to devote to the work of the office of president of the A. E. R. E. A. the time and attention that he had hoped to give to it and so he has resigned his official association affiliation.

Roy Cram has been engaged in electric railway work since 1898. During a considerable part of that time he has been active in state and national railway association affairs. He has also been a frequent contributor to the engineering and technical press. His long career in the industry was reviewed in the *ELECTRIC RAILWAY JOURNAL* for Oct. 10, 1924, page 634. It is understood that one of the proposals which he has under consideration contemplates his withdrawal to a line of endeavor not connected with railway work on its operating side.

John G. Baukat has returned to the electric railway field in the capacity of consulting engineer for the New York Railways, New York City, N. Y., where he will devote his attention to general designing and development work. For the past few years Mr. Baukat has been occupied in general consulting engineering work, principally designing and superintending the building of trolley car equipment and electric locomotives. Prior to that, from 1921 to 1923, he was president and general manager of the Batavia Car Works, Batavia, N. Y., which he organized and operated until

other interests bought the company. Mr. Baukat also served as mechanical engineer of the Hydro-Electric Power Commission of Toronto, Canada, in charge of electrifying the London & Port Stanley Railway. This job included the design and construction of all rolling stock and shops. He was also in charge of the equipment and shops of all railway properties controlled and operated by the Hydro-Electric Power Commission in Ontario.

George W. Struble has resigned as claim agent of the Oklahoma Railway, Oklahoma City, Okla., after twenty years in the service of the company. Mr. Struble began as a motorman and earned successive promotions until he reached the position of claim agent of the company. He expects to devote his time to his farm.

R. B. White, general manager of the local division of the Baltimore & Ohio Railroad at New York, included in which is the Staten Island Rapid Transit Railway, recently electrified, has been elected vice-president of the Central Railroad of New Jersey. He is well known among electric railway men and is at present a member of the committee on rapid transit of the American Electric Railway Association.

Charles A. Halbert, in the service of the Wisconsin Railroad Commission since 1913, and now chief engineer of that body, has been appointed State Chief Engineer to succeed Arthur Peabody, resigned.

David A. Ellis, since 1919 a member of the Massachusetts Department of Public Utilities, has resigned and at the close of a Mediterranean trip will devote himself to the practice of law at Boston.

Fred P. Snyder, who has been connected with the Oakwood Street Railway, Dayton, Ohio, since 1922, has been appointed general manager of the company.

R. J. Higgins, attorney for the bondholders of the Kansas City Railways, Kansas City, Mo., has become a law partner of Senator James A. Reed. The firm name will be Reed, Holmes, Higgins & Taylor. Mr. Higgins formerly was counsel for the railways at Kansas City and is a former city attorney of Kansas City, Kan.

W. W. Box, Birmingham, Ala., has been appointed chief clerk in the passenger and freight office of the Oklahoma Railway, Oklahoma City, Okla., succeeding Carl E. Knoepfel, who has accepted a position as rate clerk in the freight office of the Rock Island Railroad.

R. L. Loy, Jr., became claim agent of the Oklahoma Railway, Oklahoma City, Okla., on Jan. 1, succeeding in this capacity George W. Struble, resigned. Mr. Loy went to the Oklahoma Railway from the Rock Island Company, having been with that railroad since 1910 and having served in the claim department since 1913. After finishing school Mr. Loy was employed in a bank for a year. He then began his service with the Rock Island. Here he attracted the attention of the receivers of the Oklahoma Railway. He was born in Effingham, Ill., and went to Shawnee with his parents in 1906.

## Obituary

### W. H. Maltbie

William H. Maltbie, counsel for the United Railways & Electric Company, Baltimore, and one of the most prominent lawyers of that city, died on Jan. 23 at St. Agnes' Hospital, Baltimore, after an illness of about a week. His death was due to pneumonia. The last important case for the railway in which Mr. Maltbie participated was the valuation hearing held last year by the Maryland Public Service Commission. The decision in this case has not been rendered.

Mr. Maltbie had earned for himself a national reputation as an authority on the question of public utility valuations and as a publicist on this and other questions. He was the author of "The Theory and Practice of Public Utility Valuations," but this work represented only a small part of his contribution to the constructive thinking



W. H. Maltbie

on this subject. One of the last pieces of writing that he did was the preparation of the article "Valuation Principles in Baltimore Case," contributed by him to the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 9.

Men marveled at the clearness, force and elegance of the Maltbie contributions to the literature on utility subjects and the oral discussion of such subjects by him, but the answer was not far to seek. It was to be found in the early scholastic training of the man and in his insistence, without being pedantic, that things should be right. Indefatigable industry was at the bottom of it all. As the *Baltimore Sun* so aptly said, vague thinking, loose verbiage, obscure objectives, all were hateful to him. That paper said editorially:

His sudden, tragic passing causes, therefore, a gap in the life of the city that will not be filled. The ranks appear to close up when such a man crosses the river, but the appearance is deceptive. His peculiar combination of brains, character and diverse, yet deep, training cannot be duplicated. There is no one just like him in our community.

It is impossible to do more than to set down a part of his contribution to the work of the American Electric Railway Association. He was counsel for the association in the railway mail pay case and special counsel for the asso-

ciation in connection with the study of the subject of depreciation of electric railway properties made by the Interstate Commerce Commission with the idea of establishing definite rates to be applied to the various classes of electric railway property. He was also chairman of the committee on special taxes and a member of the committee on traffic congestion.

Seldom is it that a man develops the well-rounded ability that was possessed by W. H. Maltbie. For less than ten years he had focussed his attention on public utilities, yet engineering, operation and finance were so blended with his more intimate knowledge of law that his solution of problems showed a well-balanced appreciation of all the major factors that made his practice marked in its thoroughness.

Mr. Maltbie received his early education in Toledo and in Iowa and was graduated from the Ohio Wesleyan University. Upon his graduation he went to Baltimore, where he took a course in economics, mathematics and physics at Johns Hopkins University. Later he became professor of mathematics at Goucher College, Baltimore, and studied law. He was graduated from the University of Maryland Law School and was admitted to the bar. He remained at Goucher College until 1910. The following year he became president of the Merchants & Manufacturers Association. He was elected to the Maryland General Assembly in 1912 and while a member of that body was responsible for much constructive legislation. Mr. Maltbie was the first head of the Bureau of Municipal and State Research and following this served as a member of the City Charter Commission. During the war he was appointed assistant food administrator for the state and took full charge of this work when the administrator resigned.

Mr. Maltbie's intimate knowledge of law and mathematics and his untiring efforts to bring about improvement in every possible way were largely responsible for his appointment a few years ago as a member of Mayor Howard W. Jackson's Commission on Economy and Efficiency. He played an important part in the work of this body, which has brought about a real business administration in the city government. The work of this commission has attracted attention all over the country.

At the time of his death Mr. Maltbie was a director of the Baltimore Association of Commerce. He also had an important part in establishing the Sherwood Forest community, near Baltimore. Mr. Maltbie was born at Toledo, Ohio, in 1867.

### Frederick M. Staunton

Frederick Marshall Staunton, president of the Charleston Interurban Railway, Charleston, W. Va., and one of the most prominent business men of that city and the Kanawha Valley, died on Jan. 20 at his home in Charleston. His activities in the traction line began with his reorganization of the original company into the Interurban company. It was during his administration that the Interurban company branched out and added the traction lines to Cabin Creek Junction and

St. Albans, later acquiring the Dunbar line. He was also president of the Kanawha Banking & Trust Company and until about four years ago was president of the Diamond Ice & Coal Company. He organized these companies and developed their affairs. Mr. Staunton was 60 years old.

### Frederick A. Huntress

Frederick A. Huntress, for many years an official of the Brazilian Traction, Light & Power Company, Ltd., operating in the cities of Rio Janeiro and São Paulo, Brazil, died at Boston on Jan. 27. He had been connected with electric railways in Boston, Montreal, Halifax, N. S., and Worcester before he was chosen in 1905 as the first manager of the Rio Janeiro property. Later he was made first vice-president and general manager of the company, becoming one of the best known North Americans in Brazil. He returned from South America in 1922, and had resided since in Lenox and Boston.

Mr. Huntress was a brother of F. E. Huntress, president of the Neal Electric Headlight Company, who died Dec. 19.

Frederick N. Parsons, superintendent of the department of electrical repairs for the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., died on Jan. 11. Mr. Parsons had been connected with the Brooklyn railways almost continuously for the past twenty-eight years. He went with the old Nassau Railroad, a surface line, in 1898, served as foreman of the electrical department of the Brooklyn Rapid Transit Company from 1902 to 1907 and as superintendent of that department from that time until his death. His quiet, unassuming manner made many friends for him in the railway industry and his close attention to the details of electric railway equipment made his department the barometer of the system. Previous to his work in Brooklyn Mr. Parsons was connected with the Steel Motor Company and the Lorain Steel Company. He was 57 years old.

Judge Bernard F. Brough, who retired as Mayor of Toledo, Ohio, on Jan. 1, died on Jan. 14 after a brief illness. He served as Mayor four years. He took a keen interest in traction matters, so much so that he addressed one of the annual meetings of the American Electric Railway Association. Judge Brough was a close friend of Frank R. Coates, president of the Community Traction Company and president of the American Electric Railway Association. He was 54 years old.

Ernest Benedict, one of the oldest railway engineers in England, died on Dec. 1 at the age of 87. He was one of the last if not the last of the engineering pupils of Isambard Kingdom Brunel and was associated with the construction of the long-time famous steamship the *Great Eastern*. For many years he held important railway posts in India. On returning near the end of last century he became engaged in engineering journalism and for some years was secretary of the Tramways and Light Railways Association. For 53 years he was a member of the Institution of Civil Engineers.

## 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

### Rubber Monopoly Hit

Two Large American Concerns Formed to Stimulate the Independent Production of Rubber

Air continues to leak out of the crude rubber balloon as American consumers maintain their policy of watchful waiting. Prices in England have been steadily falling since the peak of the boom was reached several weeks ago and some speculators in rubber stocks have become rather panicky, making frenzied efforts to unload their holdings on a sluggish market. Some observers have declared this to be a result of the political turmoil engendered in United States government circles over this commodity. Whether this is actually the case or not does not seem to be the principal consideration. The main fact is that prices of the British monopoly continue to fall, while concerted efforts are being made by American interests to cope with the rubber situation without federal treasury aid.

This point was made by Secretary Hoover in a report to the House interstate commerce committee on Jan. 18. No slackening in American ventures in this field has occurred as a result of the policy of the administration to advise against government loans to those interested in plans for breaking the back of the British monopoly.

Two very positive steps have been taken in this program. One of these is the formation of a \$10,000,000 organization—the American Motor Rubber Company—whose function will be to stimulate independent production of rubber, and the other is the formulation of plans for a \$50,000,000 organization to invest in rubber plantations, now being worked out by the Rubber Association of America. Details of these two proposals are not yet available. Co-operative buying by American consumers has also been mentioned as a valuable aid in meeting the situation.

### Promotions in Timken Executive Personnel

Ernest Wooler has been appointed chief engineer of the Timken Roller Bearing Company, Canton, Ohio. This office will entail his taking full charge of all automotive, industrial, experimental and service engineering. For the past year he has held the position of automotive engineer. He is an Englishman by birth and has had experience in both American and European engineering and manufacturing practices. His qualifications for the responsible position which he now assumes are therefore unquestioned.

For the past twelve years Mr. Wooler has been an active member of the Society of Automotive Engineers and the Institution of Automobile Engineers, which is the recognized Brit-

ish society. He has held important positions with many automotive manufacturing companies, both in this country and abroad, and has designed and supervised the building of many motors and other types of automotive equipment.

Other changes in the executive personnel of the Timken company include the promotion of J. W. Spray to the position of manager of sales, automotive division; those of E. W. Austin and R. W. Ballentine to be assistant managers of sales, automotive division, and that of Peter C. Poss to be assistant advertising manager. Mr. Poss has been in the advertising department of the Timken company at Canton since joining that organization. He was formerly with the Penton Publishing Company, Cleveland.

### Gas-Electrics May Be Purchased Soon

Rumor has it that the Missouri-Pacific may shortly purchase a large number of gas-electric rail cars for use on its short lines. W. H. Fetner, chief mechanical engineer of the Missouri-Pacific Lines, was one of the officials aboard the St. Louis-built gas-electric car which was recently delivered to the Seaboard Air Line after a trial run from St. Louis to Memphis. While he refused to divulge the purpose of his trip, it has been noised abroad that the Missouri-Pacific is investigating the various types of rail cars now on the market with a view to finding the one best adapted to its own requirements.

### Convention Interprets Coast Tendencies in Bus Design

Pacific Coast problems in the design of buses were discussed on Bus Day at a convention of Mack salesmen and representatives in Seattle, Wash. The principal speakers were D. Lloyd Smith and George H. Scragg. As interpreted by these speakers and in the discussion a demand is felt in the Northwest for lighter weight buses, more powerful brakes, higher speed and better body construction. All steel bodies are growing in favor and operators desire larger seating capacity. The place of the 14 to 21-passenger stage is slowly being superseded by the 25 to 29-passenger parlor car.

These tendencies are the result of growing attention to safety and comfort, according to the opinions expressed. Blinding fogs, winding roads and quick changes from high altitudes to sea level encountered in bus operation in the Northwest are the primary causes of the new designs.

Extensive promotions of personnel will be effective on Feb. 1, it was announced. H. H. Harwood, manager of the Portland branch, will become as-

assistant to J. A. Stoner, vice-president and general manager of the Pacific Coast organization. C. C. Eickelberger, Seattle branch manager, will be special representative and territorial supervisor of the Pacific Northwest.

## St. Louis Builds Large Gas-Electric Cars

Two New Units Designed for Seaboard Air Line—Comparative Tests of Bearing Equipment to Be Made—Torsional Strains in Body Are Largely Eliminated

DELIVERY of the first of two gas-electric passenger rail cars ordered by the Seaboard Air Line Railroad has been made by the St. Louis Car Company. The second car is ready for delivery. A trial run was made by the first car from St. Louis to Indianapolis over the line of the Big Four Railroad on Jan. 14. The 267 miles were covered in six hours 48 minutes, which is considered to be an excellent record, in view of the fact that the average running time for Big Four passenger trains on the same run is six hours. No especial attempt was made to attain a high running speed.

The two cars were built by the St. Louis Car Company and the Electro-Motive Company. They are among the largest cars yet erected in this country, their length over bumpers being 71 ft. 3 3/8 in. A passenger compartment with a capacity of 34 persons and a capacious baggage compartment are provided. From the standpoint of flexibility of service, the value of the cars is greatly enhanced by the fact that they are capable of hauling three standard passenger coaches as trailers.

In designing the engine room and operator's compartment every effort was made to keep space requirements to a minimum. All of the various operating units are inclosed, thus eliminating all danger from exposed moving machinery. In the usual course of operation the engineer need only think of his throttle, controller and the air brake. There is no need for mechanical adjustments on a run made under ordinary conditions.

The prime mover of the power plant consists of two 200-hp., six-cylinder moderate speed gasoline engines, specially designed for railroad service by the Winton Engine Company of Cleveland, Ohio. Unlike other railroad gasoline engine equipment, it is not an adoption of a marine or automotive type of engine, but conforms to standard railroad practice in the use of standard United States threads and other construction features. Simplicity, rigidity and accessibility are outstanding characteristics of this design of engine.

All electrical equipment was designed

and built by the General Electric Company. The generators are mounted on the same bases as the engines and are 700-volt direct-current machines especially designed for these cars. They are excited separately. The voltage of the generators is regulated by the current demands of the motors and the en-

been delivered. The other unit will be provided with standard A.R.A. journal boxes and brasses throughout. After the two cars have been in service for a certain period, in which the power consumption on each will have been accurately measured, the bearing equipment will be interchanged and the observations continued. In this way it is hoped to determine the operating characteristics of the two types on a competitive basis. The periods of observation will of course be equal.

In designing the car the manufacturers gave especial thought to the elimination of torsional strains and the shocks usually caused by crossings, switches, curves and back tracks. Another decided advantage is the accessibility of all parts of the engine.



Completed Car Delivered to Seaboard Air Line

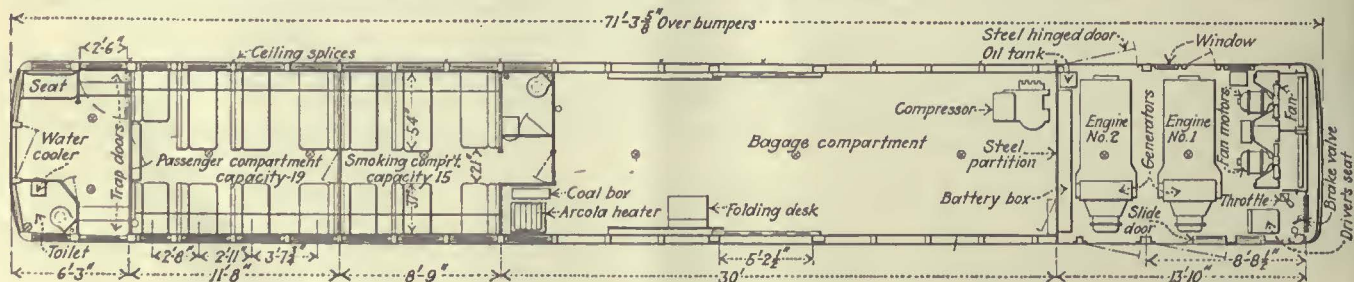
gines are designed to operate at their most efficient speed regardless of the load applied. Twin motors are provided on both the front and rear trucks of the car.

The auxiliary equipment consists of an electrically driven air compressor, which furnishes air for standard Westinghouse combined straight and automatic air brake equipment and for starting the engine. Motor-driven fans cool the engine jacket water in honeycomb radiators. Current for the lighting system is furnished by storage batteries which are charged by the exciters of the generators. A 12-in. x 12-in. compressor cylinder and a type J slack adjuster are embodied with the Westinghouse air brake equipment. The signal system is Westinghouse type M, with standard couplings and hose.

Hyatt roller bearing equipment is provided on the car which has already

The steel partition between the engine room and the baggage compartment is bolted to special steel frames so that it may be easily removed when necessary. In addition, the whole side of the engine room may be removed if it is desired to remove the engine or other parts of the power plant for repairs or replacement.

All-steel construction is used in the car body, while the inside finish is of wood. Every effort is made to insure a maximum of strength while at the same time eliminating all unnecessary weight. Without load the weight of the car is 110,000 lb. The general design of this type of car is such that modifications in the superstructure may be made to meet specific requirements. The exterior finish of the car is olive green. A capacity run of about 450 miles without refueling is claimed for these units.



Floor Plan of Car. Note Compactness of Engine Room and Effective Arrangement of Passenger Compartments



A list of the principal dimensions of the car is given here:

Length of car over bumpers.....	71 ft.	3 7/8 in.
Width of car over all.....	9 ft.	10 1/2 in.
Height of car, rail to top of roof.....	12 ft.	6 7/8 in.
Length of baggage compartment.....	30 ft.	
Length of passenger compartment (capacity 34).....	11 ft.	8 in.
Length of engine room and operator's compartment.....	13 ft.	10 in.
Truck centers.....	50 ft.	10 1/2 in.
Wheel centers.....	6 ft.	6 in.
Post centers and seat centers.....	35 in.	
Diameter of wheels.....	33 in.	

### Need for Quasi-Judicial Body Not Met by Trade Commission

Failure of the Federal Trade Commission to develop along judicial lines, as have other similar bodies of specialists, such as the Interstate Commerce Commission and the admiralty courts, is regarded as mainly responsible for the demand for its abolition. That there is a great need for a quasi-judicial body to deal with matters of unfair practice is admitted, but it will have to establish its principles out of precedent and experience.

The instinct of the people is against an institution in which the judges do the charging. The examiners and attorneys of the Interstate Commerce Commission, for instance, come before the commission in much the same way as the representatives of the Attorney-General go before the Supreme Court. They are in the same category as the representatives of the other party to the case and decisions frequently go against them.

There is evidence that the attempt of the Federal Trade Commission to fly in the face of the experience of a thousand years is unsuccessful, as its record shows that it has been wrong about 75 per cent of the time and has set up no fundamental principles which can be followed.

### Vote on Pressed Steel Merger Feb. 17

Stockholders of the Pressed Steel Car Company will meet on Feb. 17 to act on the proposed merger into the company of the Western Steel Car & Foundry Company, one of its subsidiaries. Changes in the capital structure, through an exchange of stocks, is provided.

The agreement provides that upon the merger becoming effective, the corporate existence and name of the Pressed Steel Car Company shall continue with a total authorized capital consisting of \$16,200,000 par value of preferred stock and \$46,300,000 par value of common stock, of which there will be outstanding upon the completion of the merger \$15,000,000 of preferred stock and \$12,500,000 of common stock, against \$12,500,000 of preferred stock and \$12,500,000 of common stock now outstanding.

### Mack Bus Shipments

Shipments of buses by Mack Trucks, Inc., during 1925 were 159 per cent larger than in 1924 and during the last six months of the year exceeded by 100 units shipments for the entire year 1924.

### New Equipment Will Supply Traction Power in Philadelphia

One of the largest pieces of electrical machinery of its kind ever designed, representing an investment of close to \$500,000, has been ordered by the Philadelphia Electric Company from the Westinghouse Electric & Manufacturing Company. The contract also calls for delivery of eight huge oil breakers having a voltage of 73,000 and a rupturing capacity of 1,500,000 kva. The machine, known as a frequency changer, upon completion next fall, will be installed in the Schuylkill River station of the Philadelphia Electric Company, which furnishes energy to both the Philadelphia Rapid Transit Company and the Pennsylvania Railroad. Another engineering feat of record-breaking proportion for the Richmond station of the Philadelphia Electric Company is the installation this month of six giant Westinghouse tap-changing transformers, each of 20,000 kva. capacity. Including the frequency changer, the total amount of the contracts awarded in this group aggregates nearly \$750,000.

### Problems of Roller Bearing Adaptation Are Interesting

Adapting roller bearings to the demands of modern car practice gives rise to many interesting problems. Each type of car has certain factors of weight, operating conditions, rated speed, etc., which require peculiar modifications. How these conditions are being met by SKF Industries is explained very clearly in a little booklet entitled "The Spherical Roller Bearing and Railway Journal Boxes." Four representative types of cars are considered, the single-truck safety car, the storage battery car, gasoline and Diesel electric cars.

Heavy duty spherical roller bearings have proved their worth on these and many other types of units. An important fact to consider in the modernization of used rolling stock is the facility with which existing plain bearing equipment can be changed over to roller bearings. That it is desirable to make this change is shown from the records of 500,000 car-miles operation in high-speed passenger service which spherical roller bearings have established.

### American Brown Boveri Acquires Two New Companies

American Brown Boveri Electric Corporation has recently acquired two additional properties, namely, the Railway & Industrial Engineering Company, Greensburg, Pa., and the Electric Development & Machine Company, Holmesburg, Pa., near Philadelphia. These latest acquisitions will considerably amplify the present line of American Brown Boveri electric products. In addition to these properties, the corporation has in operation its plants at Camden, as well as those of the Condit Electric Manufacturing Company, Boston; the Scintilla Magneto Company, Sidney, N. Y., and the Maloney Electric Company, St. Louis.

The newly acquired companies specialize in high-tension switching and protective equipment for power companies.

### Brill Merger Is Culminated— Election of Officers Soon

Plans for the formation of the new Brill Corporation, which controls the J. G. Brill Company and the American Car & Foundry Motors Company, have been declared operative. A meeting of stockholders for the election of officers is expected shortly and at the same time announcement will be made of final details concerning the operation of the merger. It is expected that this organization of the new Brill Corporation will play an important rôle in the fortunes of the American Car & Foundry Company, which controls a majority interest in the new company. Strong hopes are held that the earnings of the Brill Corporation will be more than sufficient to yield Car & Foundry on its controlling shares returns in excess of the preferred dividends on the parent company's \$30,000,000 of preferred stock, requiring \$2,100,000 a year.

While the Brill Corporation will undoubtedly contribute very materially to the financial well-being of Car & Foundry, it should itself shine somewhat in the reflected prestige of its controlling mentor. In other words, both parties to the agreement should profit materially. If the results hoped for from the Brill Corporation are attained, they will add largely to the balance available for Car & Foundry common stock, leaving all earnings from the car business for that issue. Complete information concerning the various ramifications of the merger is given in the issue of the ELECTRIC RAILWAY JOURNAL for Jan. 16.

### Metal, Coal and Material Prices

Metals—New York	Jan. 26, 1926
Copper, electrolytic, cents per lb.....	14.00
Copper, wire base, cents per lb.....	16.00
Lead, cents per lb.....	9.25
Zinc, cents per lb.....	8.35
Tin, Straits, cents per lb.....	61.625

#### Bituminous Coal, f.o.b. Mines

Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....	\$4.875
Somerset mine run, Boston, net tons.....	2.175
Pittsburgh mine run, Pittsburgh, net tons.....	2.05
Franklin, Ill., screenings, Chicago, net tons.....	1.875
Central, Ill., screenings, Chicago, net tons.....	1.425
Kansas screenings, Kansas City, net tons.....	2.30

#### Materials

Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....	\$7.00
Weatherproof wire base, N. Y., cents per lb.....	17.75
Cement, Chicago, net prices, without bags.....	2.10
Linseed oil (5-bbl. lots), N. Y., cents per lb.....	11.20
White lead in oil (100-lb. keg), N. Y., cents per lb.....	15.50
Turpentine (bbl. lots), N. Y., per gal.....	\$1.01

### Track and Line

Memphis Street Railway, Memphis, Tenn., has announced that it will spend about \$213,000 on tracks.

Los Angeles Railway, Los Angeles, Cal., is now at work on the second section of a track improvement job extending from 63d Street to Manchester Avenue on Vermont. The track is laid in private right-of-way in this section and is being lowered to con-

form to the adjacent street grade. Cement curbs and landings are being built and the entire surface will be graveled and oiled. The first section, extending from 63d Street to Florence Avenue, cost \$20,000, and the second section, from Florence to Manchester Avenue, will cost \$50,200.

New York, N. Y.—The Board of Transportation will be ready to let contracts aggregating between \$100,000,000 and \$150,000,000 for new subway construction this year. The board during the last year recommended contracts totaling about \$90,000,000, which have been approved by the Board of Estimate. Approval has been given to a contract with George H. Flinn, the lowest of seven bidders, for the construction of a section of subway in Eleventh Avenue between Eighteenth and 28th Street's and an appropriation of \$5,258,000 for the work.

Boston Elevated Railway, Boston, Mass., will improve its trackage in accordance with an order issued by the Massachusetts Public Utilities Commission, which in a single day gave certificates of approval of repairs, relocations and extensions in Boston, Belmont, Brookline, Cambridge, Chelsea, Everett, Medford and Somerville. In Boston the projects are:

Tremont Street, crossover 133 ft. long; Broadway, crossover 133 ft. long; Charles Street, 2,254 ft. of track; Dorchester Avenue, crossover 133 ft. long; Dover Street, 204 ft. of track and 1,171 ft. of track; Blue Hill Avenue, Roxbury, 367 ft. of track, including two crossovers; Blue Hill Avenue, at Franklin Park, Dorchester, 898 ft. of track, including crossover; East Eighth Street, from H Street to K Street, outbound track, 1,020 ft. in length; Charles Street, from Cambridge Street to Eruil Street, 599 ft. of track; Lotus place terminal, Forest Hills, special work; Dorchester and East Eighth Streets, South Boston, curved track, 725 ft. in length; Elliot Square, Roxbury, 873 ft. of track; Washington Street, crossover 133 ft. long; Park Street, Dorchester, 4,071 ft. of track; Harrison Avenue and Beach Street, 112 ft. of track; Neponset terminal, Neponset, 2,331 ft. of track; Talbot Avenue, 9,061 ft. of track, including 133 ft. of special work; Dorchester Avenue, South Boston, crossover 133 ft. long; Chelsea Street, Charlestown, 1,351 ft. of track; Norraet Avenue, Dorchester, 3,777 ft. of track; Beacon Street bridge over Boston & Albany Railroad, 1,107 ft. of track.

Belmont—Belmont Street, 2,458 ft. of track; Leonard Street, 1,004 ft. of track; Trapelo road, 3,311 ft. of track, including crossover 133 ft. long.

Brookline—Boylston Street, at Lee Street, crossover installed, 362 ft. of track.

Cambridge—Western Avenue, at Blackstone Street, crossover 133 ft. long; Cambridge bridge, at First Street, 602 ft. of track, including two crossovers; Somerville Avenue, 398 ft. of track.

Chelsea—Central Avenue, 2,253 ft. of track.

Everett—Ferry Street, 2,677 ft. of track, including crossover; Elm Street, 4152 ft. of track; Broadway and Chemical Lane, 502 ft. of track; Broadway, at Thorndike Street, 144 ft. of track in branch-off to power station.

Medford—Main Street, north of Buzzell's lane, crossover 133 ft. long; Boston Avenue, inbound track, 5,241 ft.; Curved track at Salem Street and Fellsway, 253 ft.

Somerville—Summer Street, 261 ft. of track; Cross Street, 1,889 ft. of track; Somerville Avenue, 2,877 ft. of track; Boston Avenue, 1,300 ft. of track.

Boston and Cambridge—Harvard bridge, 4,403 ft. of track, in connection with reconstruction of bridge.

Somerville and Boston—Washington Street, Somerville, and Cambridge Street, Charlestown, from near Tufts Street to 233 ft. east of Somerville line, 4,057 ft. of track.

Somerville and Medford—College Avenue, 4,063 ft. of track.

Philadelphia, Pa.—Payments aggregating \$2,723,952 have been made by the City Treasurer on warrants issued by

Director Ehlers of the Department of Transit on account of work on the construction of the various units of the subway on Broad Street. The amount paid to each contractor follows: Keystone State Construction Company, contractor for the section between Filbert and Stiles Streets, 1,335,804. Patrick McGovern, Inc., section between Clearfield and Courtland Streets, \$372,441. Patrick McGovern, Inc., section between Courtland and Chew Streets, \$540,347. Patrick McGovern, Inc., section between Chew and Grange Streets, \$475,359.

### Power Houses, Shops and Buildings

Nashville Railway & Light Company, Nashville, Tenn., has completed its \$35,000 railway substation at Colorado Avenue and 41st Street.

Pacific Electric Railway, Los Angeles, Cal., is erecting a new station in Alhambra at West Main Street and Raymond Avenue to cost approximately \$4,500. The new structure will house the ticket, freight and express offices and will contain waiting rooms.

\$500,000 Terminal Opened in Montreal.—Montreal's new \$500,000 street railway passenger terminal station has been opened for public service by the Montreal Tramways. The new terminal is situated on Craig Street West, corner of Cote Street, opposite the Street Railway Building, and next to the Power Building.

Williamsport Railways, Williamsport, Pa., plans to construct a carhouse on West Third Street. The present carhouse on West Fourth Street will be abandoned.

### Trade Notes

Fageol Company, Canton, Ohio, delivered to the Miami Beach Railway, Miami, Fla., ten gas-electric buses, type ADS-GE, during the period extending from Jan. 1 to Jan. 15. These buses were equipped with Westinghouse air brakes and the electrical equipment was supplied by the General Electric Company.

Charles J. Brickley has become connected with the Electric Service Supplies Company, Chicago. He has been connected with the Benson Electric Company, Central Electric Company and for a time operated an electrical construction company of his own. Recently Mr. Brickley has been with the Electric Steel & Sales Company, Milwaukee. He will cover Wisconsin and upper Michigan.

William K. Vanderpoel has been made vice-president and executive engineer of the Okonite Company and the Okonite-Callender Company, Inc., manufacturers of wire and cables for electric purposes, with factories at Paterson and Passaic and general offices in New York City. Prior to assuming his new duties, Mr. Vanderpoel was general superintendent of distribution of what is now the electric department of the Public Service Electric & Gas Company, Newark, N. J. He affiliated himself with Public Service in 1907 as superin-

tendent of distribution for the Essex district. He has also had considerable mining experience.

Graham Brothers, now a unit of Dodge Brothers, Inc., Detroit, Mich., is greatly increasing its output of buses. One of its new models which is gaining considerable popularity is a street car bus type, with a capacity for twenty passengers. It embodies many features suggested by experts at the American Electric Railway Association convention held last fall in Atlantic City. This company is also showing a new 32-passenger bus and a 60-passenger double-deck bus which will be in production within three months.

The Eisemann Magneto Corporation, New York, has announced important changes in its field staff. Irving W. Edwards, for the past year Pacific Coast representative, is transferred to Detroit, succeeding E. H. Hohenthal, resigned, as district manager. O. L. Bachman, who has acted as traveling service representative in the Detroit territory since 1919, becomes district manager on the Pacific Coast with headquarters at San Francisco. R. E. Dinnsen has been appointed assistant manager of the Chicago branch, succeeding C. M. Montz, resigned.

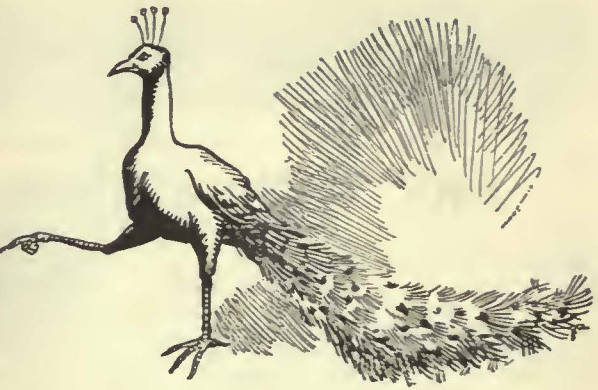
Mack Motor Truck Company, New York, announces through its office in Boston, Mass., that electric traction interests there purchased ten Mack buses during the last half of December. The Boston Elevated Railway bought five 29-passenger city type buses for operation between Union Square, Allston and Cambridge, a distance of 4 miles, for which a fare of 6 cents, 10 cents with transfer, will be charged. The schedule calls for 30 trips a day. Balloon tire equipment is used on these buses. Stone & Webster purchased for the Virginia Railway & Power Company five 230-in. bus chassis. The American Car Company will build the bodies and the buses will be put in service in Richmond, Va. The Boston & Worcester Street Railway purchased through F. T. Miller two 29-passenger Macks for operation between Saxonville and Framingham, a 4-mile route at a 10-cent fare.

### Advertising Literature

Graybar Electric Company, New York, successor to the supply department of the Western Electric Company, has issued its annual electrical supply year book for 1926-27. More than 60,000 items are listed. All are shipped under the Graybar tag guaranteeing quality and service. There is a handy index at the back of the book, together with other useful features. Copies may be obtained from the Graybar company.

Linde Air Products, New York, N. Y., announce the combination of their two monthly publications into one magazine to cover a field formerly divided between the two. The new publication is known as the "Oxy-Acetylene Tip for the Linde Oxwelder" and starts with the acquired prestige of each of its predecessors. Articles of value to all interested in welding, from the seasoned executive to the studious welder, will be carried every month.

That extra ounce  
of prevention—



Though almost any hand brake may provide a certain degree of braking power—it's the application in the emergency that prevents the accident.

To meet such emergencies as may occur, despite the best of air brakes, the Peacock Staffless Brake provides three times the power of the ordinary one and with a chain winding capacity of 144 in. it will hold brakes no matter what the brake rigging conditions may be.

Because they are dependable under all conditions—even with the heaviest passenger load on the steepest grade—Peacock Staffless Brakes are a guarantee of safety in every emergency.

Because they require minimum platform space, are light in weight and have high braking power, Peacock Staffless Brakes are especially adapted for the modern, light-weight safety car, both single and double-truck.

Installation costs are small and maintenance costs are practically negligible.

*Let us send you further facts and figures.*

**NATIONAL BRAKE CO., Inc.**

890 Ellicott Sq., BUFFALO, N. Y.

*Canadian Representatives:*

Lyman, Tube & Supply Company, Limited, Montreal, Canada

The  
Peacock  
Staffless



# PEACOCK

## Staffless Brakes

# Bankers and Engineers

## Ford, Bacon & Davis Incorporated Engineers

115 Broadway, New York  
PHILADELPHIA CHICAGO SAN FRANCISCO

## The J. G. White Engineering Corporation

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Oil Refineries and Pipe Lines, Steam and Water Power Plants, Transmission Systems, Hotels, Apartments, Office and Industrial Buildings, Railroads.

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Ride Selling

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

## Transmission Line and Special Crossing Structures, Catenary Bridges

WRITE FOR OUR NEW DESCRIPTIVE CATALOG

## ARCHBOLD-BRADY CO.

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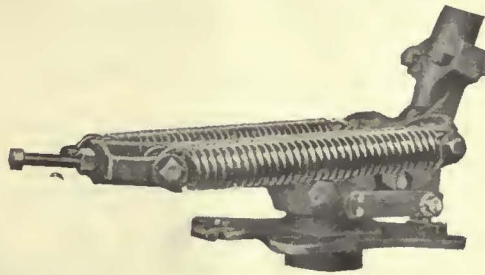
68 Trinity Place, New York

CHICAGO

ST. LOUIS

WASHINGTON

## Lest You Forget



The Famous Fourteen Points have passed into history and almost into oblivion, while the Nuttall Thirteen Points and the Famous Nuttall 13-E Trolley Base are daily making enviable service history

1. Oil Reservoir. Positively retains oil or grease and is exclusively a 13-E feature. To fill, remove the flathead screw shown in top of swivel cap.
2. Rollers and Cage. Rollers are hardened and assembled in a cage, which maintains alignment and permits assembly as a unit.
3. Races—Inner and Outer. The races are made of "SHELBY" tubing, machined, hardened and ground.
4. Trigger Lock. Locks Pole Socket in horizontal position, enabling one man to change poles in the barn under low headroom.
5. Buffer Spring. Cushions the pole socket in case the wheel leaves wire.
6. Terminal Connector. Cast Bronze Connector for sweating to Motor Lead insuring good contact. Clamp type furnished if preferred.

7. Pole Socket Bearing. Hardened Steel Bushing maintaining indefinitely a good close fit with axle pin No. 11.
8. 2-Bolt Pole Socket. Two bolts insure firmer grip and require less time for applying pole.
9. Adjusting Screw. One adjustment for all four springs.
10. Shunts. Heavy phosphor bronze straps for shunting the current from Pole Socket and Swivel to Base.
11. Axle Pin. Pole Socket Axle Pin made of hardened steel.
12. Dust Guard. Protects Roller Bearing from dust and water.
13. Accessibility. By removing these heavy locking screws and unhooking springs, the bearing cap can be removed, exposing swivel portion of base.



**R.D. NUTTALL COMPANY**  
PITTSBURGH PENNSYLVANIA

*All Westinghouse Electric and Mfg. Co. District Offices are Sales Representatives in the United States for Nuttall Electric Railway and Mine Haulage Products.*

*In Canada: Lyman Tube & Supply Co., Ltd., Montreal and Toronto*

# Nuttall

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Organized Traffic Relief and Transit Development  
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### Big Results from Little Ads

The advertisements in the Searchlight Section are constantly bringing together those who buy, sell, rent or exchange.

They convert idle commodities into useful cash, idle cash into useful commodities, and that which you have but don't want into that which you want but don't have.

The cost is a trifle, the results considerable. 0059

*Get Your Wants into the Searchlight.*

## HUMAN ENGINEERING

Railway Audit and Inspection Company, Inc.

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Boston New York } BRANCHES } Baltimore Atlanta  
New Orleans Pittsburgh } } Chicago St. Louis

### A Single Segment or a Complete Commutator

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

Cameron Electrical Mfg. Co., Ansonia, Connecticut

### THE P. EDWARD WISH SERVICE

57 Church St. Street Railway Inspection 131 State St.  
NEW YORK DETECTIVES BOSTON

## ROOT Life Guards Snow Scrapers

Remove Snow as it falls—with Root Scrapers.

Root Spring Scraper Co.

Kalamazoo, Mich.

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

## WHY DO YOU BELIEVE?

The unknown attorney tells his client  
he has no case.



The client refuses to believe and goes  
to a lawyer with a world-wide repu-  
tation



He gets the same answer and drops  
the matter for all time.



The utility of an appraisal is largely  
dependent on universal belief in its  
stated values.



Public Belief or Confidence is founded  
on *reputation* resulting from experi-  
ence and achievement.



### The American Appraisal Co.

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PUBLIC UTILITIES

INDUSTRIALS

REAL ESTATE PROPERTIES

NATURAL RESOURCES

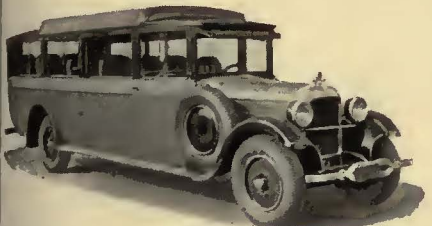
A NATIONAL ORGANIZATION

# In 5 Distinct Ways

the New Studebaker Bus Chassis is increasing  
Profits for Operators



Studebaker 18-Passenger Cross-Seat Sedan-Type Bus. The Fitzsimmons Denver Bus Line operates this Studebaker between the Aurora Government Soldiers' Hospital and Denver, Colorado. Four other busses of this type are carrying passengers between Denver and Kansas City—a distance of 678 miles. This is claimed to be the longest bus route in the country.



Studebaker 15-Passenger Chair Car De Luxe. Three Studebaker Buses of this type are being operated by the Inter-State Transit Company, between San Francisco, California, and Portland, Oregon. This Chair Car De Luxe is ideal for inter-city and suburban service.



Studebaker 15-Passenger Chair Car De Luxe. Making daily trips between Muskogee and Eufaula Okla., this Studebaker Bus is the latest addition to the Ward-Way fleet of nine busses. "It is the prettiest and slickest job of the lot, and passengers like to ride in it," writes Ward Faulkner, President, The Ward-Way, Incorporated.

**H**UNDREDS of bus operators, the country over, have proved the greater money-making possibilities of the new Studebaker Bus Chassis. Actual road experience, confirmed by cost records, has demonstrated that it positively insures more profit per passenger mile by cutting costs and attracting patronage in these five distinct ways:

**1 Lower Initial Cost.** Due to standardization of design and large-scale production, the first cost of the medium-capacity Studebaker Bus, complete with body, is about one-half the cost of the large-capacity bus.

**2 Lower Operating Cost.** Approximately 50% lower in weight than the average large-size bus. Records show it is actually 40% lower in upkeep and operation costs. Studebaker dependability cuts upkeep costs to the minimum, keeps busses on the road without interrupting earning power.

**3 More Power.** According to the rating of the Society of Automotive Engineers, the Studebaker Bus Chassis is the most powerful of its size in the world. There are 50 bus chassis with less rated horsepower and more weight. With its surplus power, the Big Six Studebaker engine can handle its load with greater ease. The chassis thus stands up better, insuring longer life and lower depreciation.

**4 Greater Strength and Safety.** Extra safety factors, including large rear axle shaft; oversize propeller shaft; deep frame, braced by eight stout cross-members; 4-wheel hydraulic brakes, etc., assure thousands of miles of safe, dependable, low-cost transportation.

**5 Greater Comfort.** The new Studebaker Bus Chassis provides passenger-car riding comfort. It has the low-hung frame and buoyant spring suspension of a passenger car. Springs are long and sturdy. Meeting the public's demand for utmost comfort plus safety, Studebaker Buses thus attract patronage.

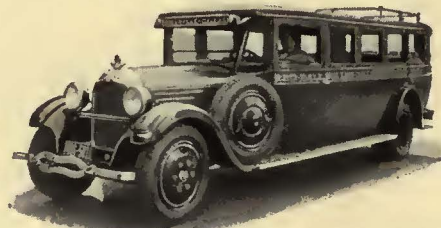
Because of these definite advantages, hundreds of operators are purchasing the new Studebaker Bus Chassis. The two sizes—158-inch wheelbase and 184-inch wheelbase—offer 6 different body types as below:

12-Pass. (including driver) cross-seat Sedan-Type	\$3785.00
15-Pass. (including driver) cross-seat Sedan-Type	\$4035.00
15-Pass. Parlor Car, Front Entrance Type	\$4800.00
19-Pass. (including driver) cross-seat Sedan-Type	\$4900.00
21-Pass. Pay-As-You-Enter Street-Car Type	\$5025.00
20-Pass. (including driver) Parlor-Car De Luxe	\$5575.00

Prices are f. o. b. factory and include full equipment



Studebaker 21-Passenger Pay-Enter Street-Car Type Buses. The West Flagler Terminal Lines, Inc., Miami, Florida, recently ordered 10 Studebaker Buses of this type—the first unit of thirty busses which the company will purchase for operation in city and suburbs.



Studebaker 18-Passenger Cross-Seat Sedan-Type Bus. Fine appearance, dependability and low operating cost were principal reasons for selecting this Studebaker Bus which is operated by the Red Ball Bus Line between Dallas and Greenville, Texas.



Studebaker 15-Passenger Cross-Seat Sedan-Type Bus. The J. A. Snyder Transportation Company, Joplin, Mo., owns and operates three Studebaker Buses. The Studebaker Bus shown above makes daily trips between Neosho and Joplin, Mo., and Pittsburg, Kansas. "Ride like a fine private car," "The last word in comfort," are comments from passengers.



Studebaker 18-Passenger Cross-Seat Sedan-Type Buses. The Chicago, North Shore & Milwaukee Electric Railroad is operating these Studebaker Buses between points on the company's rail lines and Kenosha, McHenry and Libertyville. Performance has been so satisfactory that a fourth bus of the 21-passenger street-car type was recently ordered

# Rivaling the highest-priced busses in every feature—except price!

Unexcelled luxury and comfort in this new Studebaker 20-Passenger Chair Car De Luxe, mounted on the most powerful bus chassis of its size in the world—price, \$5575



This New Studebaker 20-Passenger Chair Car De Luxe is being operated by the Balcer Brothers' Motor Coach Company between Tawas, Standish and Bay City, Michigan.

**T**HIS new Chair Car De Luxe on the specially designed Studebaker bus chassis has taken the bus industry by storm. It has won instant and overwhelming approval due to its beautiful design and luxurious riding comfort. It combines remarkably low first cost—\$5575—with low operating cost.

In appearance and refinement of finish, this bus can be compared only with the large parlor-car busses selling for from \$10,000 to \$12,000.

Note the low-hung body with its graceful, tapering roof. Body framework is of selected hardwood. Finish is rich, durable lacquer.

### Luxurious, Roomy Interior

Entrance door is on the forward right-hand side. Door control mechanism is concealed, being operated by a small hand lever at the left of the driver's seat.

Individual arm chairs, with backs and cushions of genuine leather. Liberal leg and head room.

Among the interior features are mohair head and side lining, boquet window draperies, dome lights, six ventilators, etc. There is a railed-in baggage compartment at the driver's

right, and additional accommodation for luggage on roof.

Mounted on specially designed Studebaker bus chassis, this bus is ideal for intercity and suburban service. It has the speed, stamina and dependability to answer the most rigorous demands.

According to the rating of the Society of Automotive Engineers, the new Studebaker bus chassis is the most powerful chassis of its size in the world. There are 36 bus chassis on the market with less power and more weight.

### Unusually Complete Equipment

Equipment includes stop-signal system; illuminated destination sign box (above windshield); automatic windshield cleaner; rear-view mirror; front and rear bumpers; motometer; extra tire and tube with spare wheel, mounted on left front fender; 8-day clock and gasoline gauge, plus the usual instruments.

Due to standardized design and large-scale production the new Studebaker Chair Car De Luxe is offered at a remarkably low price. Write for further description. Use the coupon below.

Price **\$5575**

F. O. B. FACTORY

Including dual rear wheels. Purchase can be arranged on a liberal Budget Payment Plan—a conservative down payment and balance in convenient monthly installments.

**NOW FREE:**

Mail coupon at right and obtain free a copy of our unique booklet, "Profitable Bus Operation." It contains facts and figures of vital interest to every bus owner.

THE STUDEBAKER CORPORATION OF AMERICA,  
Dept. 15 South Bend, Ind.  
Send me free "Profitable Bus Operation" without obligation.

Name.....  
Address.....  
City..... State.....  
How many busses have you at present?.....  
If you desire special information on any particular Studebaker Bus, indicate the type and size in which you are interested.  
Type: Sedan..... Parlor Car..... Street-Car Type.....  
Capacity:..... Passengers.

- first cost
- depreciation cost
- maintenance cost
- operating cost

**Lower**



# No Adjustments 'til Linings Wear Out

Net  
profits  
reflect  
this  
saving  
in  
time  
and  
money



**B**USSES equipped with Christensen Automotive Air Brakes are not "out" for brake adjustments until brake linings require renewal.

Absence of adjustment is due to the absolute simplicity of the Christensen brake; without exposed levers, pull rods, cables, knuckles, universal connections, or cams.

A cylinder mounted inside the brake drum; two opposing pistons whose stems transmit a direct thrust against opposite ends of the brake shoe; nothing else. The only connection required between wheels and frame is the flexible reinforced hose that carries the air to the cylinder.

It will pay every one in any way responsible for bus operation or who is contemplating the operating of busses to read the descriptive booklet, "Christensen Automotive Air Brakes." Write for your copy.

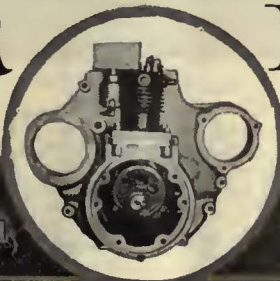
*Christensen Air Brakes can be secured as original equipment upon all the leading busses when specified.*

# Christensen

## AIR BRAKES

CHRISTENSEN  
6513 Cedar Ave.

AIR BRAKE CO.,  
Cleveland, Ohio





Goodyear Balloon Tire Equipped Coach No. 214 of the Colonial Coach Lines, Watertown, N. Y.

**GOODYEAR**

Copyright 1928, by The Goodyear Tire & Rubber Co., Inc.

# "They have given us Double the Mileage"

Mr. H. B. Weaver, Chairman of the Colonial Coach Lines Company, Watertown, N. Y., writes us, describing the ideals of his Lines' service and the experience they are having with Goodyear Pneumatic Bus Tires:

"We are trying to give our patrons not only a very convenient and very economical service, over our 900 miles of road between the Pennsylvania border and the Canadian line, but also a very comfortable and dependable one.

"Ours is by no means a difficult route. Practically every mile of it is improved. Yet it has its rough spots, and in season we have ice, snow and mud to battle.

"In this duty the performance of the Goodyear Tires with which

several of our buses are equipped has been most satisfactory.

"We have Goodyear Cord Bus Tires in service today that have given us *double* the mileage we have received from other pneumatic bus tires.

"They also double their advantage by giving us *trouble-free* mileage. They fit in exactly with our Lines' policy of providing the public with every essential and luxury of motorized highway transportation."

\* \* \*

Goodyear Bus Tires make records for long, economical, trouble-free mileage wherever they are used. The Goodyear Bus Tire line offers you the particular tire that is suited to your operating conditions.

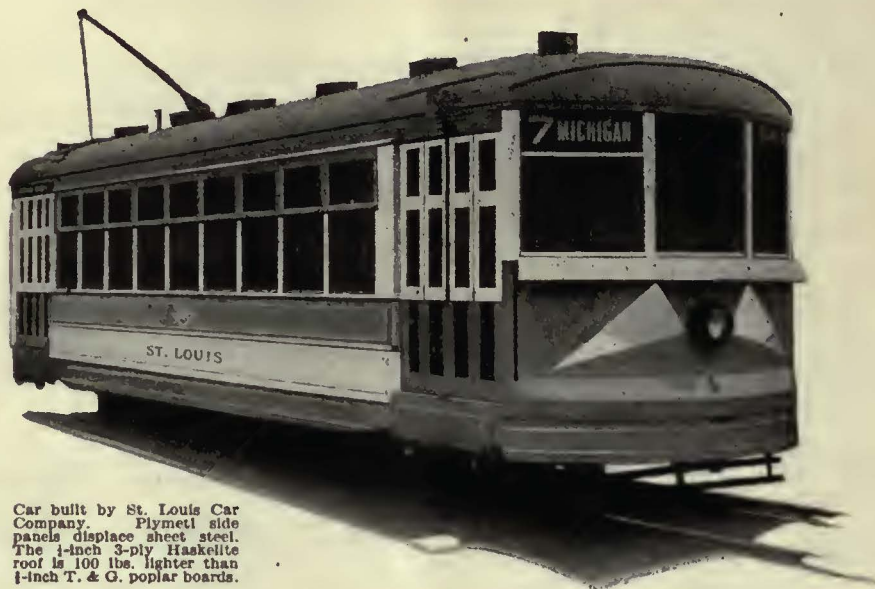
*For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service*

# BUS TIRES

*Made with SUPERTWIST*

# HASKELITE *and* PLYMETL

## *on the Grand Rapids Cars*



Car built by St. Louis Car Company. Plymetl side panels displace sheet steel. The 1-inch 3-ply Haskelite roof is 100 lbs. lighter than 1-inch T. & G. poplar boards.

**T**HE Grand Rapids experiment is noteworthy as the first attempt on a large scale to see how far it is possible to go in cutting down weight through the selection of materials and careful design. The 27 cars recently ordered from the St. Louis Car Co., as the first result of this experiment, embody Plymetl side panels and Haskelite Roofs.

In the attempt to produce the lighter, faster, more attractive and more economical cars demanded by modern conditions, Haskelite and Plymetl possess unique advantages. They supplant heavier materials for roofs, head linings, interior and exterior panels, linings, trim and sub-floors. Joints are minimized. A stiffer, lighter, quieter, and more com-

fortable car results from the use of these materials. Haskelite and Plymetl are the logical materials for modern cars and are accepted as standard by prominent builders and operators today.

Our engineers will be glad to discuss the applications and advantages of these materials for your new or repair work.

# HASKELITE MFG. CORPORATION

133 W. Washington St., Chicago, Ill.

# TIMKEN



## 333 Timken-equipped busses for Newark, N. J.

*The largest single bus order ever placed*

The Public Service Railway Company of Newark, N. J., has placed with the Yellow Truck & Coach Manufacturing Company, of Chicago, an order for 333 single-deck, dual-drive gas-electric busses. This represents an expenditure of over \$3,000,000 and, so far as can be determined, is the largest individual order ever placed for motor busses.

Each of the vehicles will be equipped front and rear with Timken Axles, specially designed and built for Yellow Coaches.

The selection of axles was based on the simplicity and dependability of the worm drive principle, plus Timken painstaking workmanship.



THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.

# AXLES

# American BROWN BOVERI Power Rectifiers

Efficient in Sub-Station Service  
under extreme load variation

Widely used in Europe for a number of years, Mercury-Arc Power Rectifiers have found their most popular application in the electric railway field. Their ability to effectively handle the fluctuations in load on railway lines without material loss in efficiency, from no-load, to high overload, is proved. There is no inertia of heavy rotating parts to be overcome.

On the accompanying chart are curves showing the comparative efficiencies of the three classes of conversion equipment—Rectifiers, Rotaries and Motor-Generators; This data was developed from actual tests. Note the great advantage of the mercury-arc rectifier at one-quarter load, an ordi-

nary condition on traction lines in non-rush hours.

Other advantages of the Mercury-Arc Power Rectifier are:—absolutely quiet operation, no moving parts except small auxiliaries, adaptable to full automatic operation, minimum maintenance required.

Further details of the principles, construction and operating features of this equipment will be given in subsequent advertisements.

Brown Boveri engineers have developed the Mercury-Arc Power Rectifier to a high degree of perfection in Europe. We are now prepared to build and install this type of equipment in America.

---

## Products of American Brown Boveri Electric Corporation

*Electric Locomotives  
for any system of current, high or low  
tensions  
Complete Equipment  
for railway electrification  
Mercury-Arc Power Rectifiers  
(steel enclosed)  
Diesel-Electric Locomotives  
Mining Locomotives*

*Motors (all sizes and types)  
Rotary Converters  
Motor Generators  
Transformers (power or current)  
Switches, Controllers  
and all Auxiliary Equipment  
Oil Switches  
Condensers and Auxiliaries*

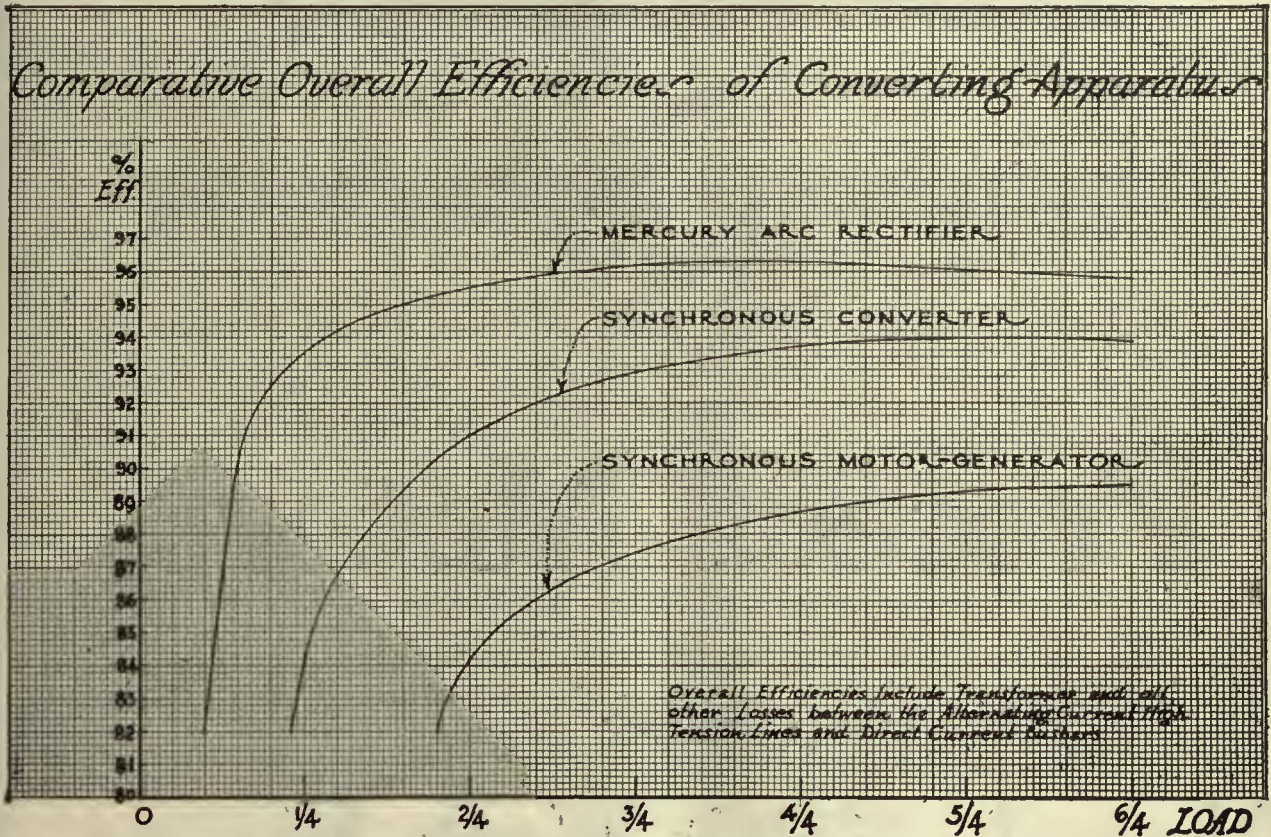
*Steam Turbo Generators  
for normal or high pressures and  
superheats  
Automatic Regulators  
Relays  
Turbo Compressors and Blowers  
Electric Furnaces  
Induction Regulators*

---

*Recommends*

# Mercury Arc—Steel Enclosed Power Rectifiers for Sub Station Service

*Comparative Overall Efficiencies of Converting Apparatus*



*Graphic Comparative Efficiency with Rotative Equipment*

Mercury-Arc Power Rectifiers pay for themselves quickly where D.C. load factor is variable or low.

In addition to their recognized position in the railway field, they can advantageously replace rotating equipment in Cen-

tral Station distribution and industrial application, not only because of their great efficiency, but because they are noiseless in operation, cause no vibration, do not require special foundation and occupy a minimum of space.

# American Brown Boveri Electric Corporation

Plants at Camden, New Jersey

Main Office: 165 Broadway, New York



# Maintain Schedules

*(Noark 600 Volt Fuses Carry FULL Rated Load)*

# Protect Motors

Use

# Noark 600 Volt Fuses

they

*“Blow on the Dot”*

Not too soon ● Not too late

# The Johns-Pratt Company

Division of Colt's Patent Fire Arms Mfg. Co.

New York  
Boston

Hartford, Conn.

Chicago  
San Francisco



Noark Fuses  
"Blow on the Dot"



Noark Fuse  
Clips and Bases



Noark  
Service Boxes



Noark Under-  
ground Boxes



Noark Meter  
Service System



Noark Railway  
and Mine Material



J.P. Welding Service  
on Contract Basis



Vulcanized Packing  
and Pump Valves



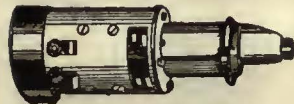
J.P. Molded Auto  
and Radio Parts







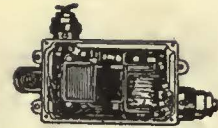
Generator



Starting Motor



Magnetic Switch



Voltage Regulator

Specifications —  
 ELECTRICAL EQUIPMENT *Leece-Neville Voltage Regulation*  
 MECHANICAL " *John Jan*

## Specify LEECE-NEVILLE Voltage Regulation Easily fitted to practically all chassis without change

Very probably the buses you order will have Leece-Neville Voltage Regulation as standard equipment. Such famous chassis manufacturers as White, Brockway, Rehbunger, Schacht, Guilder, Commerce, Autocar, Larrabee-Deyo, Wilcox, Edwards, Brill and Oneida have already included it in their specifications. Otherwise,

make sure of Leece-Neville advantages by specifying it on your order. Our service stations are stocked for immediate delivery of equipments for Continental, Wisconsin, Buda and Waukesha Motored Buses. No changes are necessary. Installations can be made quickly and easily without interfering with your delivery dates.

*Write now for our Booklet.*

### These are the demonstrated advantages of Voltage Regulation

The battery cannot be over-charged.

The battery is charged only at the correct rate for its condition.

The battery will go longer without refilling with water.

The life of the battery is greatly prolonged.

The lights can be operated direct from the generator when the engine is running.

Loose or corroded battery connections will not cause the lamp bulbs to burn out due to a rise in voltage.

It is the most economically operated generating system for motor bus use.

THE LEECE-NEVILLE COMPANY  
 CLEVELAND, OHIO



# Eight Years Ago



Photo when Dayton Ties were being installed in 1917.

The cost  
of the  
little in  
of its

The eight years of traffic—much of it interurban—have failed to leave their mark upon this track.

Dayton Tie construction has again proven its worth. The wood block and resilient asphalt cushion have absorbed and deadened the vibration and blows of traffic that would have caused disintegration of the foundation.

The excellent condition of the track, even at the joints, where wear usually starts, is the result.



# and Today

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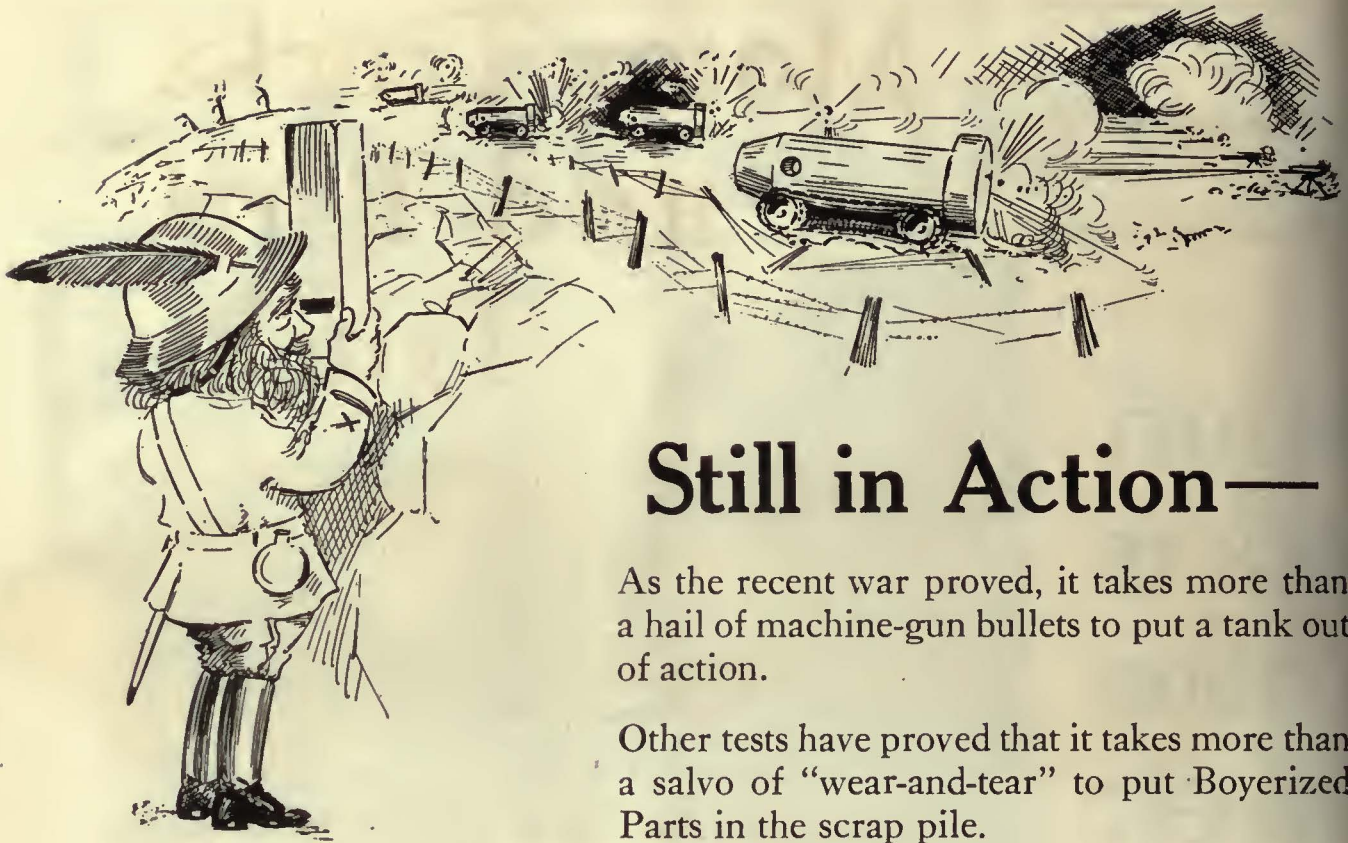
Details of design and construction and cost data will be furnished upon request.

Dayton Resilient Ties were installed upon this section of the Dayton, Springfield & Xenia Southern Railway in 1917. The above photograph was taken in 1925.

Besides showing the excellent preservation of the track and paving, it shows clearly how this section has built up recently.



Tie Company ~ ~ ~  
OHIO



## Still in Action—

As the recent war proved, it takes more than a hail of machine-gun bullets to put a tank out of action.

Other tests have proved that it takes more than a salvo of "wear-and-tear" to put Boyerized Parts in the scrap pile.

Made of tough steel to begin with, Boyerized Parts are put through a process that gives them a glossy, glass-hard, armor-plate coating that defies the destructive elements. They last three to four times as long as the same quality of untreated steel.

Brake Pins  
Brake Hangers  
Brake Levers  
Pedestal Gibs  
Brake Fulcrums  
Center Bearings  
Side Bearings  
Spring Post Bushings

Spring Posts  
Bolster and Transom Chafing Plates  
Manganese Brake Heads  
Manganese Truck Parts  
Bushings  
Bronze Bearings  
McArthur Turnbuckles

### Bemis Car Truck Company

*Electric Railway Supplies*  
Springfield, Mass.

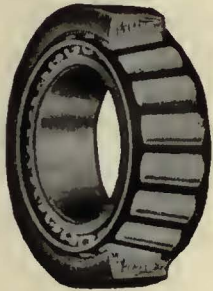
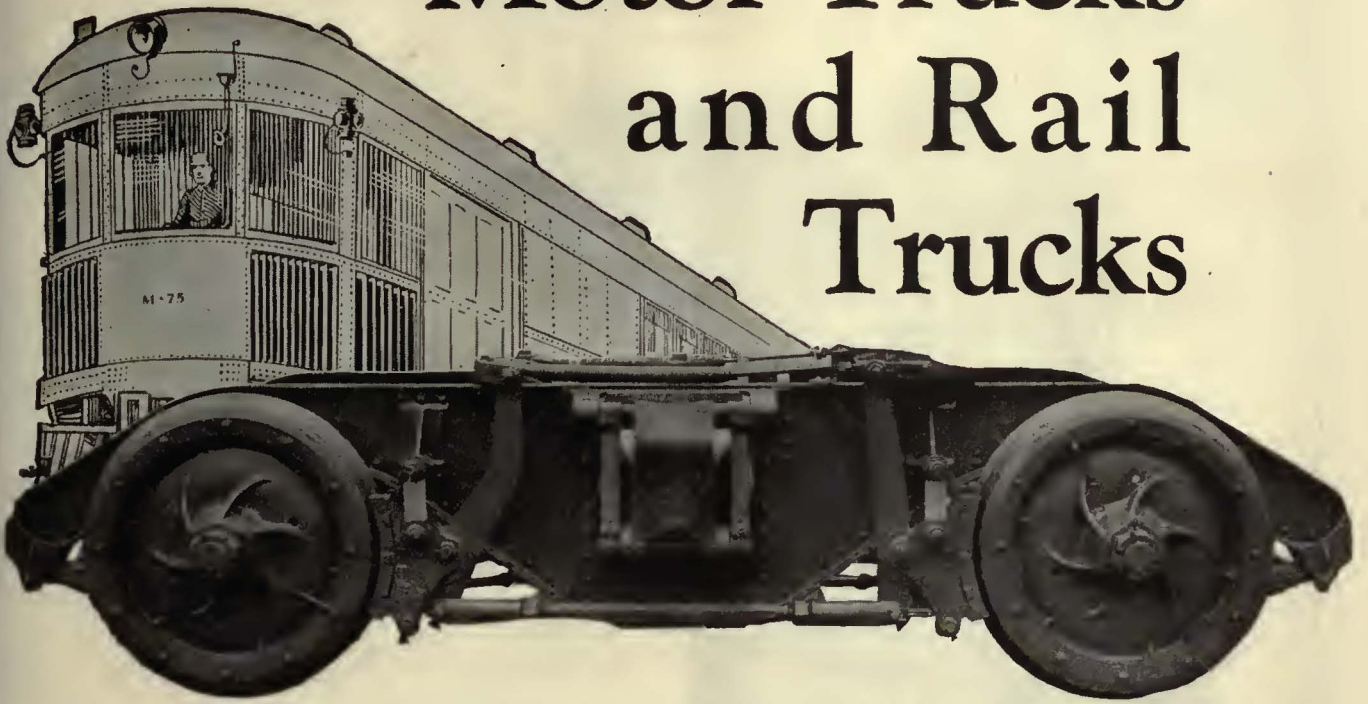
#### REPRESENTATIVES:

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, Oregon.  
J. H. Denton, 1328 Broadway, New York City, N. Y.  
A. W. Arlln, 772 Pacific Electric Bldg., Los Angeles, Cal.

It's  
Boyerized



# Motor Trucks and Rail Trucks

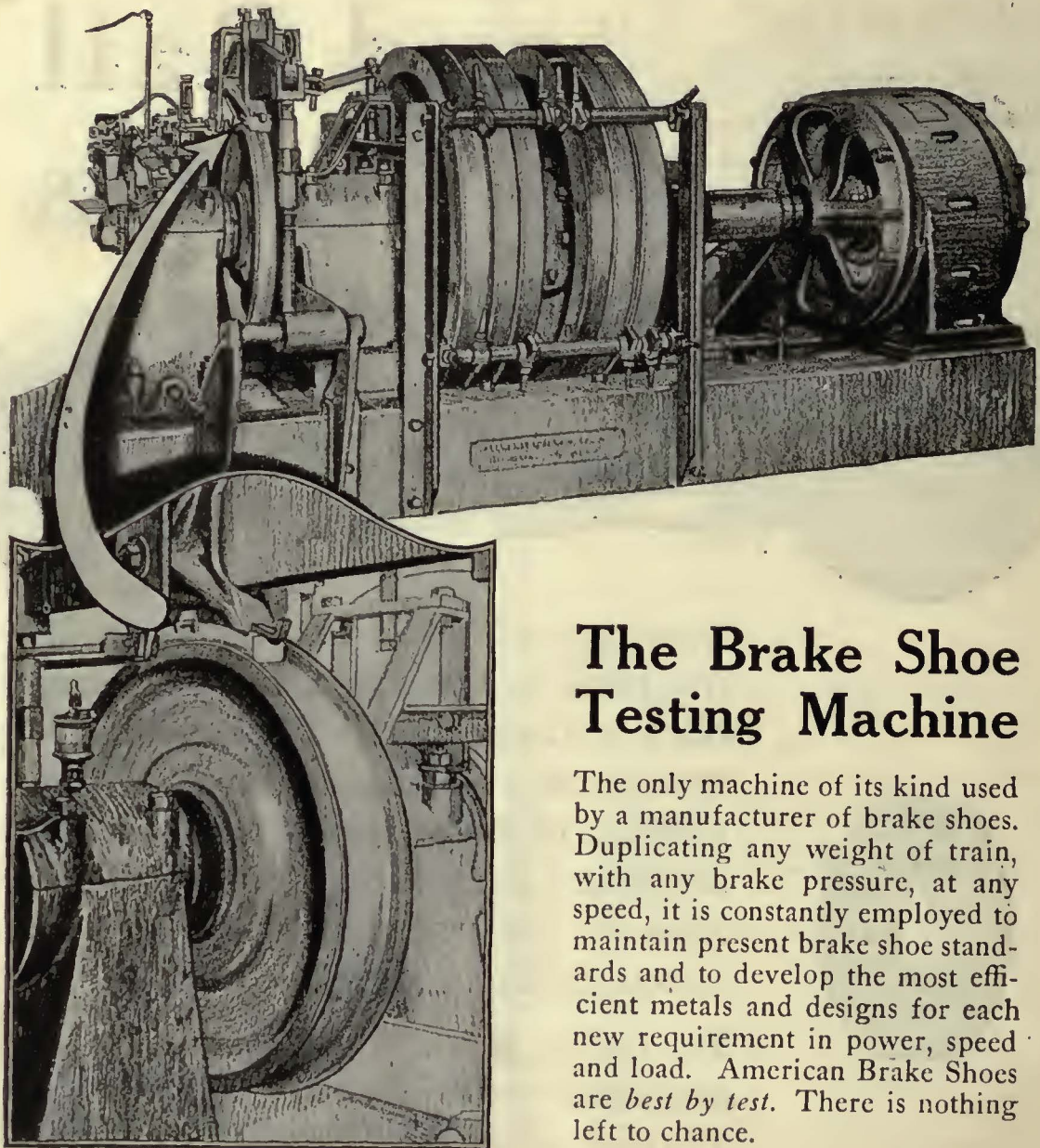


Steel pounds steel at a mile-a-minute pace in the wheel trucks of gasoline rail cars. All this shock, all the thrust of rounding steel curves, and all the huge normal radial loads are being carried by Timken Bearings in the gas cars built by the noted Brill company.

It shows what a wide margin of endurance also is built into motor trucks equipped with Timken Tapered Roller Bearings. That is why over 90% of all makes of commercial cars in this country are Timken-equipped.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

**TIMKEN**  
*Tapered*  
**ROLLER BEARINGS**



## The Brake Shoe Testing Machine

The only machine of its kind used by a manufacturer of brake shoes. Duplicating any weight of train, with any brake pressure, at any speed, it is constantly employed to maintain present brake shoe standards and to develop the most efficient metals and designs for each new requirement in power, speed and load. American Brake Shoes are *best by test*. There is nothing left to chance.

### THE AMERICAN BRAKE SHOE & FOUNDRY COMPANY

30 CHURCH ST., NEW YORK  
332 SO. MICH. AVE., CHICAGO

# International Creosoted Ties

*"The wooden tie—with reasons why!"*



## Quiet!

## Sound-proofed Car Tracks

**W**OODEN ties absorb the shock and vibration of passing cars. They deaden disagreeable rumblings and subdue those clashing sounds at joints and special work.

And *International Creosoted Ties* by lasting many times longer than untreated wood, maintain the line and surface of rails, insuring the smooth, quiet running of cars.

Your Association—the A. E. R. A.—is working toward noiseless operation. We submit as a practical first step—"Sound-proof your track construction with *International Creosoted Ties*." They are cut to standard specifications, carefully graded and thoroughly treated with the highest quality creosote oil.

**International Creosoting & Construction Co.**

General Office—Galveston, Texas

Plants: Texarkana, Texas    Beaumont, Texas  
Galveston, Texas

*Prompt Shipment  
from Stock to any point  
in the United States*



# Noted for noiselessness ~

## European city tractions are praised

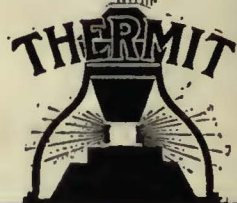
American tourists and visiting railway men invariably remark the smooth quietness with which European electric railway cars glide along the streets.

Most of those systems have large mileage of Thermit-welded track. To a large extent it is standard practice in European cities. They have learned there, that it isn't necessary to tolerate the noise and trouble caused by loose, broken and cupped rail joints. They eliminate the joints and the noise by Thermit-welding rails.

## Your A.E.R.A. Committee says—

It is the opinion of your Committee that the standard or degree of track maintenance may be blamed for the largest percentage of the objectionable and disturbing noises directly attributable to track conditions. Under this head are the following general noise-making condi-

Clipping from Report of the Committee on WAY MATTERS, Engineering Association, 1925, on their assigned subject "Reduction of Noise in Car Operation."



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

PITTSBURGH

CHICAGO

BOSTON

SOUTH SAN FRANCISCO

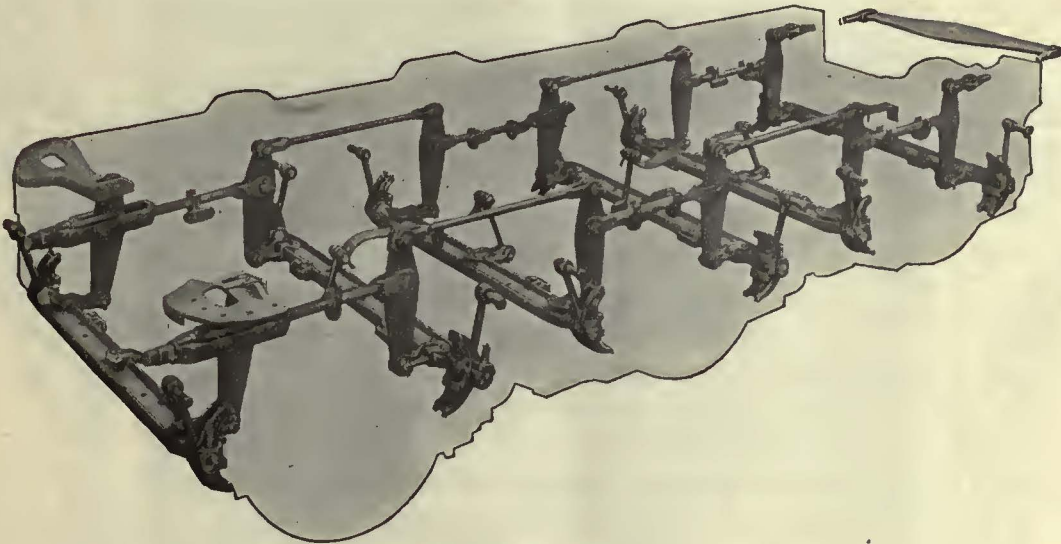
TORONTO



# SHORT SMOOTH STOPS

*With*

## SIMPLEX CLASP BRAKES



### REDUCE THESE TROUBLES

Hot Boxes	Train Resistance
Slid-Flat Wheels	Shocks and Hard Riding
Excessive Brake Shoe Wear	

### SIMPLEX CLASP BRAKES *Eliminate*

Journal Disturbances Which Cause Hot Boxes

Dragging Shoes and Stuck Brakes which cause Heavy Train Resistance and Slid-Flat Wheels.

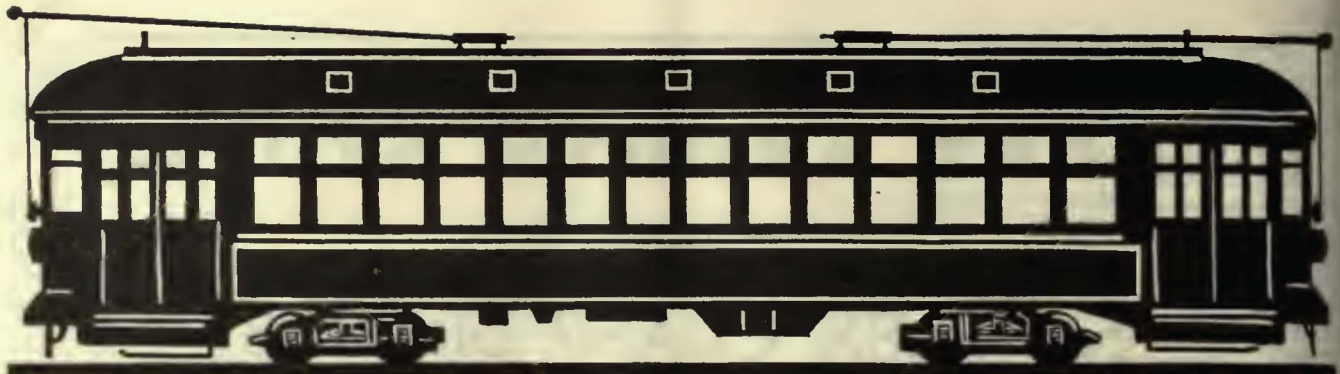
Heavy Shoe Pressures and Unbalanced Loads on Truck Frames and Truck Springs which cause Hard Riding, Shocks, and High Brake Shoe Maintenance Costs.

## AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

ST. LOUIS



THE ILLINOIS STEEL COMPANY makes no extravagant claims for Gary Wrought Rolled Steel Wheels in electric railway service. It merely submits that for years and years it has been a world-leader in quality steel manufacture; that all the skill, metallurgical knowledge and engineering experience gained in this long period has been incorporated into the design and manufacture of Gary Wrought Steel Wheels; and that wherever these wheels have been used, notable performance has been recorded.

If, therefore, you are not entirely satisfied with your present wheels; if perhaps they need replacing too frequently or regrinding too often; if, in a word, they don't give you the service that you think perfect wheels should give—we suggest that you investigate the records being made regularly by the Gary Wrought Steel Wheel in service similar to your own.

Illinois Steel Company  
 General Offices • 208 South La Salle Street  
 Chicago, Illinois

GARY  
 STEEL

WROUGHT





## MODERN CARS

An essential element in your program of progress. Replace heavy, obsolete cars with light-weight, attractive rolling stock, which by increased patronage and reduced operating and maintenance cost, will soon pay off their cost. Consult our engineers who will gladly co-operate with you in designing cars to meet today's needs. Or submit your specifications for our estimate.

## CUMMINGS CAR AND COACH CO.

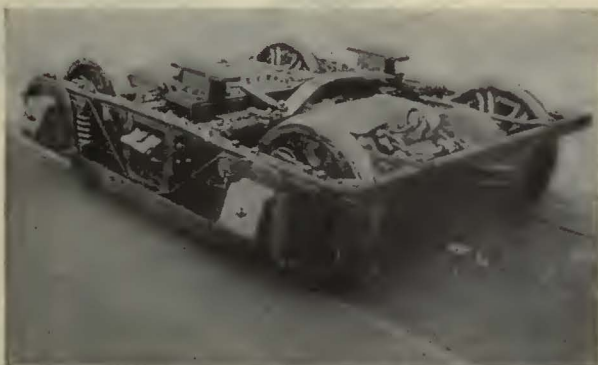
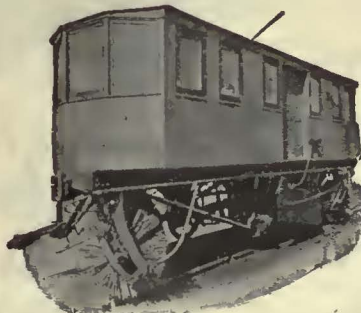
*Successors to McGuire-Cummings*  
111 W. Monroe St., Chicago, Ill.

### Gas-Electric Motor Coaches

Are built complete in our shops. They apply the experience gained in twenty-five years of street car building to the motor coach, embodying an attractive, rugged and comfortable body and the latest, most satisfactory form of motive power.



Type MC62 light truck, with inside hung brake equalizers, 26-inch wheels, 5-ft. 4-in. wheel base. For low car body, city service type cars.



### SNOW FIGHTING EQUIPMENT

Our Snow Sweepers and Plows are in use the country over.

# Annual Maintenance Number

## Railways Plan to Spend \$296,000,000 for Plant and Material in 1926

Purchasing Power of the Industry Shows Healthy Progress—An Increase of 11.66 per Cent Over Last Year's Figures Is Promised—Large Track Construction Program Is Included in Forecast Submitted by the 57 Operating Companies Furnishing Information

1926

ELECTRIC RAILWAY JOURNAL

## 34 per Cent of Passenger Cars Are Over Twenty Years Old

Less than Half of All Cars Now in Electric Railway Service Were Purchased in the Last Fifteen Years—Greater Number of New Cars Are Needed to Modernize Industry than Was Anticipated—Nationwide Survey More than Confirms Previous Estimates

more

## Track Extensions Show Substantial Gain Over Previous Years

Electric Railway Mileage Added During Past Twelve Months Is Larger than in Any Other Year Since 1918—Extensions to City and Interurban Trackage Show Increases Over 1924 — More than Twice as Much Steam Railroad Mileage Was Electrified

ELECTRIC RAILWAY JOURNAL

## Bus Operation by Electric Railways Broke All Records in 1925

More Companies Inaugurated Bus Service During the Past Twelvemonth than in Any Previous Year—The Number of Buses Operated More than Doubled—Purchases of New Passenger and Service Equipment Were Greater than Ever Before

## Electrification Costs and Benefits in 1925

Occurred in Major Trends Indicates Only Durin Method of Comp Com S. Richey Engineer, Worcester, Mass

ELECTRIC

ershi

Few in Receiv...  
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-to be dated March 20, 1926

*From the Industry's Headlines—learn a lesson!*

A REMARKABLE opportunity for the manufacturers of railway equipment and supplies is revealed by the data published in the January 2nd Statistical Issue of ELECTRIC RAILWAY JOURNAL. A few of the strikingly suggestive facts are indicated in the headlines reproduced here.

The definitely-indicated movement toward modernization of rolling stock, brings with it the problems of modernizing maintenance, to the end that riders, attracted by new cars, may be retained as permanent patrons. Only by keeping cars, track and line in the pink of condition can a present-day public be kept "sold" on the electric railway as a means of transportation.

It is to the further exposition of this timely subject, that the big Annual Maintenance Number of ELECTRIC RAILWAY JOURNAL will be dedicated. The producer and distributor of electric railway equipment, supplies, maintenance materials and shop machinery, represented in this issue will derive enhanced value from ample advertising space, due to this tie-in with a timely and appropriate editorial program.

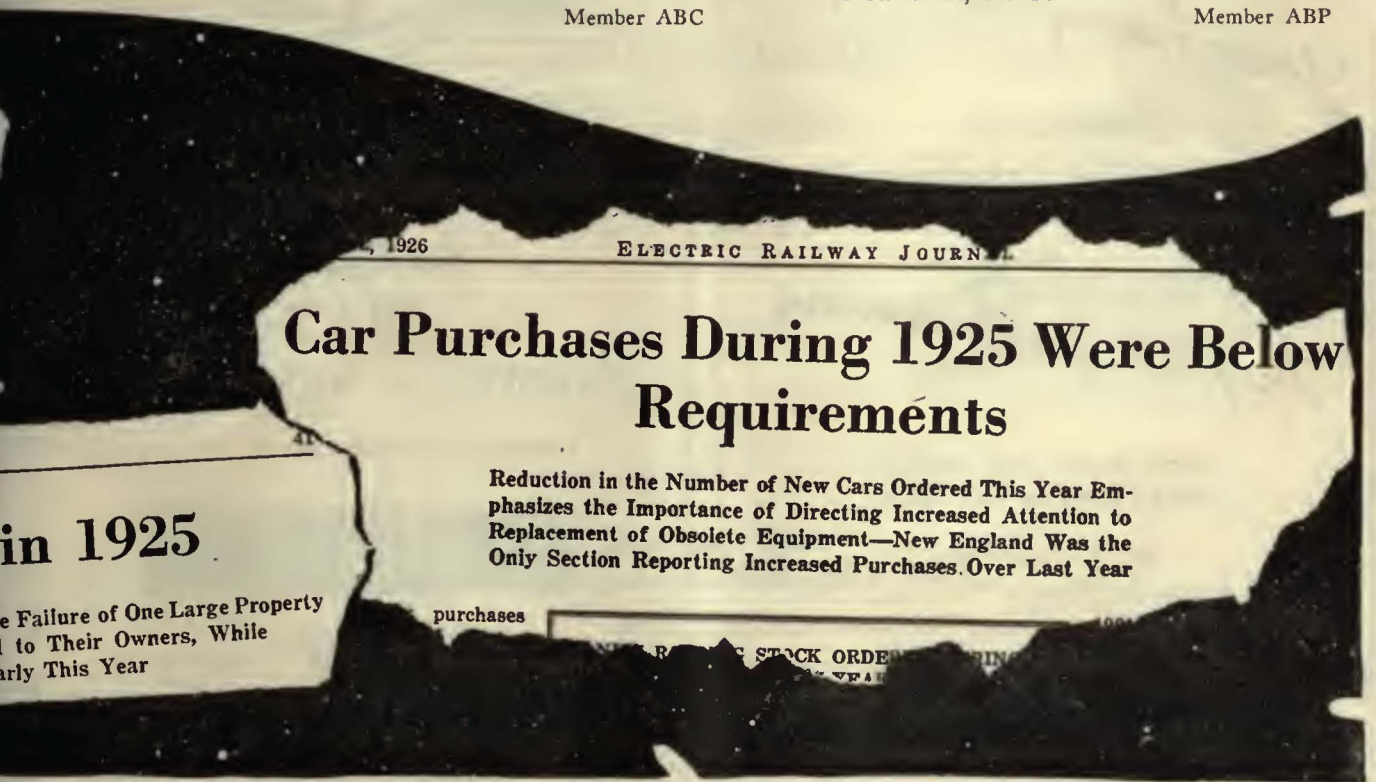
# ELECTRIC RAILWAY JOURNAL

(A McGraw-Hill Publication)

Tenth Avenue at 36th Street  
New York, N. Y.

Member ABC

Member ABP



1926 ELECTRIC RAILWAY JOURNAL

## Car Purchases During 1925 Were Below Requirements

Reduction in the Number of New Cars Ordered This Year Emphasizes the Importance of Directing Increased Attention to Replacement of Obsolete Equipment—New England Was the Only Section Reporting Increased Purchases Over Last Year

in 1925

Failure of One Large Property to Their Owners, While Early This Year

purchases

STOCK ORDER



**MORE-JONES  
TROLLEY  
WHEELS  
AND  
HARPS**

WE MANUFACTURE various types of trolley equipment. The quality of metal, conductivity, resistance to friction, effect on overhead, shape and size of wheel groove, have all been carefully worked out and perfected. In addition to the highly specialized V-K Oilless Trolley Wheels and Harps, More-Jones make the most complete line of lubricated trolley wheels and harps to meet all requirements. Let us quote you.

More-Jones Brass & Metal Co.  
St. Louis, Mo.

**MORE-JONES  
QUALITY PRODUCTS**



*"Tool Steel"  
helical gears  
are*

*Quiet on the start  
and*

*Continue Quiet  
because*

*They don't wear.*

**BUY THE BEST**

The Tool Steel Gear and Pinion Co.  
CINCINNATI, OHIO

*You're having brush trouble*

**CORRECT IT  
USE LE CARBONE CARBON BRUSHES**

*They talk for themselves*

**COST MORE PER BRUSH  
COST LESS PER CAR MILE**

**W. J. Jeandron**  
Hoboken Factory Terminal,  
Building F, Fifteenth Street, Hoboken, N. J.

Pittsburgh Office: 634 Wabash Bldg.  
Chicago Office: 1657 Monadnock Block  
San Francisco Office: 525 Market Street  
Canadian Distributors: Lyman Tube & Supply Co., Ltd.,  
Montreal and Toronto



**Cold Dinners**

for your passengers?

Not if you use

**AJAX  
BABBITT for ARMATURES**

*keeps the rolling stock rolling*



**The Ajax Metal Company**

Established 1880

**PHILADELPHIA**

NEW YORK

CHICAGO

BOSTON

CLEVELAND



# Collier Service

A nation-wide  
organization  
building and  
sustaining car  
card advertising  
space values



**Barron G. Collier, Inc.**

Candler Bldg.  
New York

## The DIFFERENTIAL CAR



Standard on  
60 Railways for

Track Maintenance  
Track Construction  
Ash Disposal  
Coal Hauling  
Concrete Materials  
Waste Handling  
Excavated Materials  
Hauling Cross Ties  
Snow Disposal

Use These Labor Savers

Differential Crane Car  
Clark Concrete Breaker  
Differential Bottom Dump Ballast Car  
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

## SPECIALISTS

in the

Design and Manufacture  
of

Standard—Insulated—and  
Compromise Rail Joints

The Rail Joint Company  
61 Broadway, New York City



We make a specialty of  
**ELECTRIC RAILWAY  
LUBRICATION**

We solicit a test of TULC  
on your equipment

The Universal Lubricating Co.  
Cleveland, Ohio

Chicago Representatives: Jameson-Ross Company,  
Straus Bldg.

*The  
Hubbard makes the line  
Hubbard makes the  
Hardware*



**Hubbard and COMPANY**

PITTSBURGH • OAKLAND, CAL. • CHICAGO

## ELRECO TUBULAR POLES



THE "WIRE LOCK"      THE REINFORCED JOINT

COMBINE

Lowest Cost      Lightest Weight  
Least Maintenance      Greatest Adaptability

Catalog complete with engineering data sent on request.

**ELECTRIC RAILWAY EQUIPMENT CO.**  
CINCINNATI, OHIO

New York City, 30 Church Street

—a manufacturer

in Newark, N. J.

—saved \$200

buying from an Indiana dealer in

—second-hand machinery

through his advertising in the

—searchlight section



*It pays*  
to read the Searchlight.

*It pays*  
to advertise in the Searchlight.



0058

B. A. HEGEMAN, Jr., President      C. C. CASTLE, First Vice-President  
H. A. HEGEMAN, Vice-Pres. and Treas.      F. T. SARGENT, Secretary  
W. C. PETERS, Manager Sales and Engineering

## National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York  
Munsey Bldg., Washington, D. C.      100 Boylston St., Boston, Mass.  
Hegeman-Castle Corporation, Railway Exchange Building, Chicago.

### RAILWAY SUPPLIES

Tool Steel Gears and Pinions  
Bell Locked Fare Box and Change  
Maker  
The Aluminum Field Coils  
Walter Tractor Snow Plows  
Cutler-Hammer Electric Heaters  
Genesco Paint Oils  
Garland Ventilators  
Flaxlinum Insulation  
Yellow Coach Mfg. Co.'s Single  
and Double Deck Busses.  
B. G. Spark Plugs

Economy Electric Devices Co.'s  
Power Saving and Inspection  
Meters  
Anglo-American Varnish Co.,  
Varnishes, Enamels, etc.  
National Hand Holds  
Ft. Pitt Spring & Mfg. Co.,  
Springs  
Anderson Slack Adjusters  
Feasible Drop Brake Staffs  
Dunham Hopper Door Devices

## Kalamazoo Trolley Wheels

The value of Kalamazoo Trolley  
Wheels and Harps has been  
demonstrated by large and small  
electric railway systems for a  
period of thirty years. Being  
exclusive manufacturers, with  
no other lines to maintain, it is  
through the high quality of our  
product that we merit the large  
patronage we now enjoy. With  
the assurance that you pay no  
premium for quality we will  
appreciate your inquiries.



**THE STAR BRASS WORKS**  
KALAMAZOO, MICH., U. S. A.



# THE BABCOCK & WILCOX COMPANY

85 LIBERTY STREET, NEW YORK

Builders since 1868 of  
Water Tube Boilers  
of continuing reliability

Makers of Steam Superheaters  
since 1898 and of Chain Grate  
Stokers since 1893



**BRANCH OFFICES**

BOSTON, 49 Federal Street  
PHILADELPHIA, Packard Building  
PITTSBURGH, Farmers Deposit Bank Building  
CLEVELAND, Guardian Building  
CHICAGO, Marquette Building  
CINCINNATI, Traction Building  
ATLANTA, Candler Building  
PHOENIX, ARIZ., Heard Building  
DALLAS, TEX., 2001 Magnolia Building  
HONOLULU, H. T., Castle & Cooke Building  
PORTLAND, ORE., 805 Gasco Building

**WORKS**  
Bayonne, N. J.  
Barberton, Ohio

**BRANCH OFFICES**

DETROIT, Ford Building  
NEW ORLEANS, 521-5 Baronne Street  
HOUSTON, TEXAS, 1011-13 Electric Building  
DENVER, 435 Seventeenth Street  
SALT LAKE CITY, 405-6 Kearns Building  
SAN FRANCISCO, Sheldon Building  
LOS ANGELES, 404-6 Central Building  
SEATTLE, L. C. Smith Building  
HAVANA, CUBA, Calle de Aguiar 104  
SAN JUAN, Porto Rico, Royal Bank Building

## Arc Weld Rail Bonds

AND ALL OTHER TYPES

*Descriptive Catalogue Furnished*

### American Steel & Wire Company

Chicago New York Boston Cleveland Pittsburgh Denver  
U. S. Steel Products Co.  
San Francisco Los Angeles Portland Seattle



Special Track Work of every  
description

## THE BUDA COMPANY

Harvey (Suburb Chicago) Illinois

## Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints;  
Splice Bars; Hard Center Frogs; Hard Center  
Mates; Rolled Alloy Steel Crossings; Abbott and  
Center Rib Base Plates; Rolled Steel Wheels and  
Forged Axles; Tie Rods; Bolts; Tie Plates and  
Pole Line Material.

*Catalog Sent on Request*

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.

# BETHLEHEM

## Lorain Special Trackwork Girder Rails

*Electrically Welded Joints*

### THE LORAIN STEEL COMPANY

Johnstown, Pa.

*Sales Offices:*

Atlanta Chicago Cleveland New York  
Philadelphia Pittsburgh

*Pacific Coast Representative:*

United States Steel Products Company  
Portland San Francisco

Los Angeles Seattle

*Export Representative:*

United States Steel Products Company, New York, N. Y.

# WHARTON

Special Trackwork  
Switches-Mates-Frogs-Crossings  
incorporating the famous  
Tisco Manganese Steel

Wm. Wharton Jr. & Co., Inc.

Easton, Pa.  
Offices

Boston Chicago El Paso Montreal New York Philadelphia  
Pittsburgh Salt Lake City San Francisco Scranton

*"The Standard for Rubber Insulation"*

# INSULATED WIRES and CABLES

*"Okonite," "Manson," and Dundee "A" "B" Tapes*



*Send for Handbook*

The Okonite Company  
 The Okonite-Callender Cable Company, Inc.

Factories, PASSAIC, N. J.      PATERSON, N. J.

Sales Offices: New York Chicago Pittsburgh St. Louis  
 Atlanta Birmingham San Francisco  
 Los Angeles

Pottingsell-Andrews Co., Boston, Mass.  
 F. D. Lawrence Electric Co., Cincinnati, O.  
 Novelty Electric Co., Phila., Pa.  
 Canadian Representatives:  
 Engineering Materials Limited, Montreal.

## Waterproofed Trolley Cord



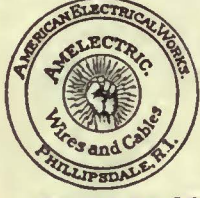
Is the finest cord that science and skill can produce. Its wearing qualities are unsurpassed.

**FOR POSITIVE SATISFACTION ORDER SILVER LAKE**

If you are not familiar with the quality you will be surprised at its **ENDURANCE** and **ECONOMY**.

*Sold by Net Weights and Full Lengths*

**SILVER LAKE COMPANY**  
*Manufacturers of bell, signal and other cords.*  
 Newtonville, Massachusetts



**AMELECTRIC PRODUCTS**

**BARE COPPER WIRE AND CABLE**  
**TROLLEY WIRE**  
**WEATHERPROOF WIRE AND CABLE**  
**PAPER INSULATED UNDERGROUND CABLE**  
**MAGNET WIRE**

Reg. U. S. Pat. Office  
 Incandescent Lamp Cord

**AMERICAN ELECTRICAL WORKS**  
 PHILLIPSDALE, R. I.

Boston, 176 Federal; Chicago, 112 W. Adams;  
 Cincinnati, Traction Bldg.; New York, 166 E. 42nd St

**THE WORLD'S STANDARD**

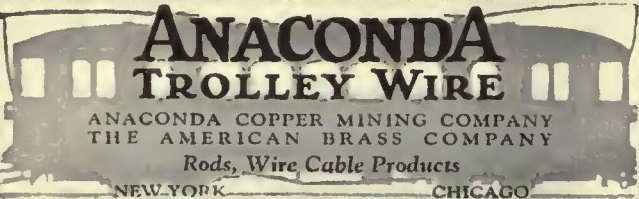
# "IRVINGTON"

Black and Yellow  
 Varnished Silk, Varnished Cambric, Varnished Paper

Irr-O-Slot Insulation    Flexible Varnished Tubing  
 Insulating Varnishes and Compounds

**Irvington Varnish & Insulator Co.**  
 Irvington, N. J.

*Sales Representatives in the Principal Cities*



# ANACONDA TROLLEY WIRE

ANACONDA COPPER MINING COMPANY  
 THE AMERICAN BRASS COMPANY

*Rods, Wire Cable Products*

NEW YORK      CHICAGO

## Chapman Automatic Signals

Charles N. Wood Co., Boston



## AUTOMATIC SIGNALS

Highway Crossing Bells  
 Headway Recorders  
 Flasher Relays



**NACHOD SIGNAL COMPANY, INC.**  
 LOUISVILLE, KENTUCKY.



**ROEBLING**

**WELDING CABLE**  
**ELECTRICAL WIRES and CABLES**  
 John A. Roebling's Sons Company, Trenton, N. J.

Northern **CEDAR POLES** Western

We guarantee  
 all grades of poles; also any butt-treating specifications

**BELL LUMBER COMPANY**  
 Minneapolis, Minn.



**Standard Underground Cable Co.**

BOSTON    PHILADELPHIA    PITTSBURGH    DETROIT  
 NEW YORK    WASHINGTON    CHICAGO    ST. LOUIS    SAN FRANCISCO



**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.**

# NAUGLE POLES

WESTERN & NORTHERN CEDAR

**NAUGLE POLE & TIE CO.**  
 59 E. MADISON ST. CHICAGO ILL.  
*New York • Columbus • Kansas City • Spokane • Vancouver • Boston*

# SEARCHLIGHT SECTION

USED EQUIPMENT & NEW—BUSINESS OPPORTUNITIES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 4 cents a word, minimum 75 cents an insertion, payable in advance.  
Positions Vacant and all other classifications, 8 cents a word, minimum charge \$2.00.  
Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.  
Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 to 3 inches.....\$4.50 an inch  
4 to 7 inches..... 4.30 an inch  
8 to 14 inches..... 4.10 an inch  
Rates for larger spaces, or yearly rates, on request.  
An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

## POSITIONS VACANT

WANTED foreman armature winding department immediately in Kenmore shops of The Northern Ohio Traction & Light Company, Akron, Ohio. Address: P. V. C. See, N. O. T. & L., Kenmore Shops, Kenmore, Ohio.

## FOR SALE

### 30 Birney Safety Cars

Brill Built  
West, 508 or G. E. 264 Motors. Cars Complete—Low Price—Fine Condition.

ELECTRIC EQUIPMENT CO.  
Commonwealth Bldg., Philadelphia, Pa.

Over 6000 other men in the Electric Railway Field will see this page

Then—isn't this the logical place to advertise any business wants you may have of interest to Electric Railway men?

EMPLOYMENT BUSINESS or EQUIPMENT OPPORTUNITIES, Etc., Etc., Etc.

## Attention—Buyers

FOR SALE APPROXIMATELY

4000 tons of 70 lb. ASCE first class Steel Rail and Angle Bars, 30-ft. lengths.

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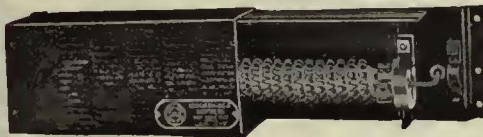
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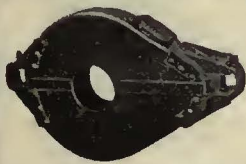
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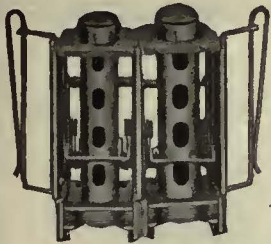
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Wm. Wharton, Jr. & Co., Inc.
- Manganese Steel Switches, Frogs & Crossings**  
Bethlehem Steel Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.
- Meters (See Instruments)**
- Motor Huses (See Buses, Motor)**
- Motors, Electric**  
Amer. Brown Boveri Elec. Corp.  
General Electric Co.  
Westinghouse E. & M. Co.
- Motors and Generators, Set**  
Allis-Chalmers Mfg. Co.  
Amer. Brown Boveri Elec. Corp.  
General Electric Co.
- Motormen's Seats**  
Brill Co., J. G.  
Elec. Service Sup. Co.  
Heywood-Wakefield Co.  
St. Louis Car Co.  
Wood Co., Chas. N.
- Nuts and Bolts**  
Bemis Car Truck Co.  
Bethlehem Steel Co.  
Hubbard & Co.
- Oils (See Lubricants)**
- Omnibuses (See Buses, Motor)**
- Oxy-Acetylene (See Cutting Apparatus, Oxy-Acetylene)**
- Oxygen**  
International Oxygen Co.
- Packing**  
Westinghouse E. & M. Co.
- Paint**  
Amer. Asphalt Paint Co.
- Paints and Varnishes (Insulating)**  
Electric Service Supplies Co.  
Irvington Varnish & Ins. Co.
- Paints and Varnishes for Woodwork**  
National Ry. Appliance Co.
- Panels, Outside, Inside**  
Haskelite Mfg. Corp.
- Paving Guards, Steel**  
Consolidated Car Heat. Co.  
Westinghouse E. & M. Co.
- Rattan**  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
Elec. Service Supplies Co.  
Hale-Kilburn Co.  
St. Louis Car Co.
- Rectifiers, Mercury**  
Amer. Brown Boveri Elec. Corp.
- Registers and Fittings**  
Brill Co., The J. G.  
Elec. Service Supplies Co.  
Intern'l Register Co., The  
Ohmer Fare Register Co.  
Rooke Automatic Register Co.  
St. Louis Car Co.
- Reinforcement, Concrete**  
Amer. Steel & Wire Co.
- Repair Shop Appliances (See also Coil Banding and Winding Machines)**  
Elec. Service Supplies Co.
- Repair Work (See also Coils)**  
General Electric Co.  
Westinghouse E. & M. Co.
- Replacers, Car**  
Elec. Service Sup. Co.
- Resistances**  
Consolidated Car Heat. Co.  
Resistance, Wire and Tube  
American Steel & Wire Co.  
General Electric Co.  
Westinghouse E. & M. Co.
- Retrievers, Trolley (See Catchers and Retrievers, Trolley)**
- Rheostats**  
General Electric Co.  
Westinghouse E. & M. Co.
- Roofing, Car**  
Haskelite Mfg. Co.  
Pantastote Co., Inc.
- Roofs, Car and Bus**  
Haskelite Mfg. Corp.
- Sanders, Track**  
Brill Co., The J. G.  
Elec. Service Snp. Co.  
Nichols-Lintern Co.  
Ohio Brass Co.  
St. Louis Car Co.
- Sash Fixtures, Car**  
Brill Co., The J. G.  
St. Louis Car Co.
- Scrapers, Track (See Cleaners and Scrapers, Track)**
- Screw Drivers, Rubber Insulated**  
Elec. Service Sup. Co.
- Seats, Bus**  
Brill Co., The J. G.  
Hale-Kilburn Co.
- Seats, Car (See also Rattan)**  
Brill Co., The J. G.  
Hale-Kilburn Co.  
St. Louis Car Co.
- Seating Materials**  
Brill Co., J. G.  
Haskelite Mfg. Corp.  
Pantastote Co., Inc.  
St. Louis Car Co.
- Second Hand Equipment**  
Electric Equipment Co.  
Gerke, J. W.  
Hyman-Michaels
- Shades, Vestibule**  
Brill Co., The J. G.
- Shinyela**  
Brill Co., The J. G.  
Hubbard & Co.
- Side Bearings (See Bearings, Center and Side)**
- Signals, Car Starting**  
Consolidated Car Heat. Co.  
Elec. Service Sup. Co.  
Nat'l Pneumatic Co., Inc.
- Signals, Indicating**  
Nichols-Lintern Co.
- Signal Systems, Highway Crossing**  
Nachod Signal Co., Inc.  
Wood Co., Chas. N.
- Signal Systems, Block**  
Elec. Service Sup. Co.  
Nachod Signal Co., Inc.
- Shaft Adjusters (See Brake Adjusters)**
- Sleeve Wheels and Cutters**  
Elec. Ry. Equipment Co.  
Elec. Ry. Improvement Co.  
Elec. Service Supplies Co.  
More-Jones Brass & Metal Co.  
Nuttall Co., R. D.
- Smokestacks, Car**  
Nichols-Lintern Co.
- Snow-Plows, Sweepers and Brooms**  
Brill Co., The J. G.  
Consolidated Car Fender Co.  
Cummings Car & Coach Co.  
Root Spring Scraper Co.  
St. Louis Car Co.
- Sockets and Receptacles**  
Johna-Manville, Inc.
- Soldering and Brazing Apparatus (See Welding Processes and Apparatus)**  
Irvington Varnish & Ins. Co.
- Special Adhesive Papers**  
Irvington Varnish & Ins. Co.
- Special Trackwork**  
Bethlehem Steel Co.  
Lorain Steel Co.  
Wm. Wharton, Jr. & Co.
- Spikes**  
Amer. Steel & Wire Co.  
Illinois Steel Co.
- Splining Compounds**  
Westinghouse E. & M. Co.
- Splining Sleeves (See Clamps and Connectors)**
- Springs, Car and Truck**  
Amer. Steel & Wire Co.  
Bemis Car & Truck Co.  
Brill Co., The J. G.  
St. Louis Car Co.
- Sprinklers, Track and Road**  
Brill Co., The J. G.  
Cummings Car & Coach Co.  
St. Louis Car Co.
- Steel and Steel Products**  
Carnegie Steel Co.  
Illinois Steel Co.
- Steps, Car**  
Brill Co., The J. G.  
Morton Mfg. Co.
- Stokers, Mechanical**  
Babcock & Wilcox Co.  
Westinghouse E. & M. Co.
- Storage Batteries (See Batteries, Storage)**
- Strain Insulators**  
Electric Service Supplies Co.  
Ohio Brass Co.  
Westinghouse E. & M. Co.
- Strand**  
American Steel & Wire Co.  
Roebbling's Sons Co., J. A.
- Subway Boxes**  
Johna-Pratt Co.
- Superheaters**  
Babcock & Wilcox Co.
- Sweepers, Snow (See Snow Plows, Sweepers and Brooms)**
- Switches, Safety**  
Johna-Pratt Co.
- Switches, Selector**  
Nichols-Lintern Co.
- Switches, Tee Rail**  
Ramapo Ajax Corp.
- Switches, Track (See Track Special Work)**
- Switches and Switchboards**  
Amer. Brown Boveri Elec. Corp.  
Elec. Service Supplies Co.  
General Electric Co.  
Westinghouse E. & M. Co.
- Tampers, Tie**  
Railway Track-work Co.
- Tapes and Cloths (See Insulating Cloth, Paper and Tape)**
- Tee Rail Special Track Work**  
Bethlehem Steel Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co.
- Telephones and Parts**  
Elec. Service Supplies Co.
- Terminals, Cable**  
Std. Underground Cable Co.
- Testing Devices, Meter**  
Johna-Pratt Co.
- Testing Instruments (See Instruments, Electrical Measuring, Testing, etc.)**
- Thermostats**  
Consolidated Car Heat. Co.  
Gold Car Heat. & Ltg. Co.  
Railway Utility Co.  
Smith Heater Co., Peter
- Ticket Choppers and Destroyers**  
Elec. Service Supplies Co.
- Tie Plates**  
Illinois Steel Co.
- Ties, Mechanical**  
Dayton Mechanical Tie Co.
- Ties and Tie Rods, Steel**  
Carnegie Steel Co.  
Godwin Co., Inc., W. S.  
International Steel Tie Co.
- Ties, Wood Cross (See Poles, Ties, Posts, etc.)**
- Tires**  
Goodyear Tire & Rubber Co.
- Tongue Swivels**  
Wm. Wharton, Jr. & Co., Inc.
- Tools, Track & Miscellaneous**  
Amer. Steel & Wire Co.  
Elec. Service Supplies Co.  
Hubbard & Co.  
Railway Track-work Co.
- Tool Steel**  
Bethlehem Steel Co.
- Torches, Acetylene (See Cutting Apparatus)**
- Towers and Transmission Structures**  
Archbold-Brady Co.  
Westinghouse E. & M. Co.
- Track Expansion Joints**  
Wm. Wharton, Jr. & Co., Inc.
- Track Grinders**  
Metal & Thermit Corp.  
Railway Track-work Co.
- Track, Special Work**  
Barbour-Stockwell Co.  
Bethlehem Steel Co.  
Buda Co.  
Ramapo Ajax Corp.  
Wm. Wharton, Jr. & Co., Inc.
- Trackless Trolley Cars**  
Brill Co., The J. G.  
St. Louis Car Co.
- Transfer (See Tickets)**
- Transfer Issuing Machines**  
Ohmer Fare Register Co.
- Transfer Tables**  
American Bridge Co.
- Transformers**  
Amer. Brown Boveri Elec. Corp.  
General Electric Co.  
Westinghouse E. & M. Co.
- Transportation Publication**  
Blake & Jackson's  
Electric Railway Transportation
- Treads, Safety, Stair, Car Step**  
Irving Iron Works  
Morton Mfg. Co.
- Trolley Bases**  
General Electric Co.  
More-Jones Brass & Metal Co.  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Bases, Retrieving**  
Nuttall Co., R. D.  
Ohio Brass Co.
- Trolley Buses**  
Brill Co., The J. G.  
General Electric Co.  
Westinghouse E. & M. Co.

# JOHNSON Universal Changer



## Adjustable

The best changer on the market. Can be adjusted by the conductor to throw out a varying number of coins, necessary to meet changes in rates of fares.

## Flexible

Each barrel a separate unit, permitting the conductor to interchange the barrels to suit his personal requirements, and to facilitate the addition of extra barrels.

**JOHNSON FARE BOX COMPANY**  
Ravenswood, Chicago, Ill.



Type R-11  
Double Register

## International Registers

Made in single and double types to meet requirements of service. For hand or foot, mechanical or electric operation. Counters, car fittings, conductors' punches.

Exclusive selling agents for  
HEEREN ENAMEL BADGES.

**The International Register Co.**  
15 South Throop Street, Chicago, Illinois



**WHETHER** you sell your transportation via motorbus or electric railway car, the Ohmer Fare Register offers the most perfect protection for the passenger, the conductor and the company.

We also manufacture the Ohmer Fare Box, the Ohmer Hub-Odometer, the Ohmer Receipt Printing Taximeter, the Atco Taximeter, the Ohmer Truck Auditor, and the Ohmer Dashodometer.

**Ohmer Fare Register Company**  
Dayton, Ohio, U. S. A.



## FARE BOXES for BUSES

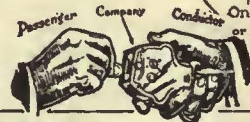
Let us tell you of this especially designed box for this class of service.

**The Cleveland Fare Box Co.**  
4900 Lexington Ave., Cleveland, O.  
Canadian Cleveland Fare Box Co., Ltd.  
Preston, Ontario

COIN COUNTING And Sorting Machines CHANGES CARRIERS Tokens

## Instantaneous Registration by the Passenger ROOKE of fare collection SYSTEM

Meets every condition for all types of cars and buses. The stand device, as shown, adapts it to one-man uses—making register portable or stationary, at option. Handles nickels, dimes, quarters, or metal tickets, in any combination, FLEXIBILITY with CERTAINTY.



**Rooke Automatic Register Company** Providence, R. I.

## "POSITIONS WANTED"

is the heading under which many excellent positions have been secured through the

## "SEARCHLIGHT SECTION"

**MEN!** Use these columns for good jobs.

**EMPLOYERS!** Consult these columns for good men.

4 cents a word. Minimum 75 cents an insertion. 0131



## Gets Every Fare PERY TURNSTILES or PASSIMETERS

Use them in your Prepayment Areas and Street Cars

**Pery Manufacturing Co., Inc.**  
101 Park Avenue, New York City

"Axle Specialists Since 1866"  
Address all Mail to Post Office Box 515, Richmond, Va.

## CAR AXLES J. R. JOHNSON AND CO., INC.

FORGED STEEL AXLES

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

ALPHABETICAL INDEX TO ADVERTISEMENTS

Table with 4 columns: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y. Lists company names and page numbers.

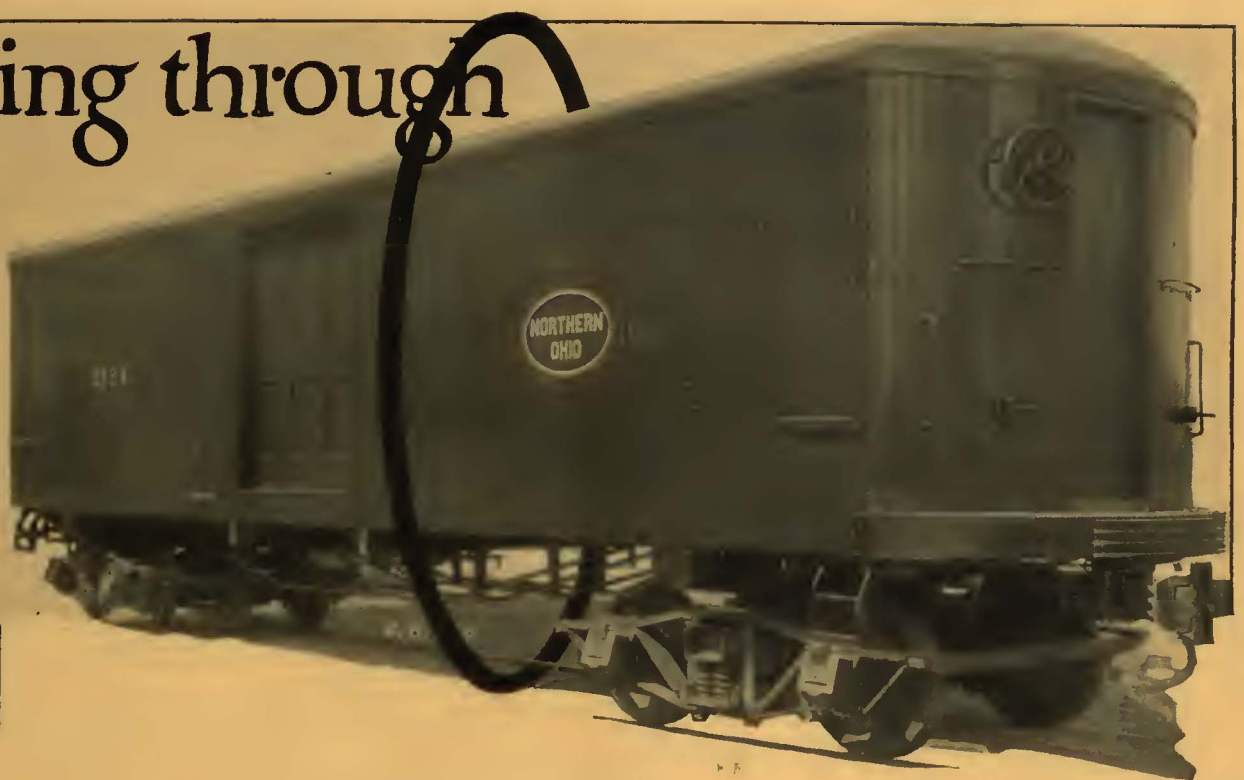
WHAT AND WHERE TO BUY

(Continued from page 58)

Grid of 4 columns listing various products and suppliers such as 'Trolley Material, Overhead Elec. Service Supplies Co.', 'Lightweight Noiseless Electric Street Car Co.', 'Varnished Papers & Silks', 'Welding Processes and Apparatus', 'Wheels, Trolley Elec. Ry. Equipment Co.', etc.



Going through



## 70 C. E. R. A. Standard Box Cars at Kuhlman

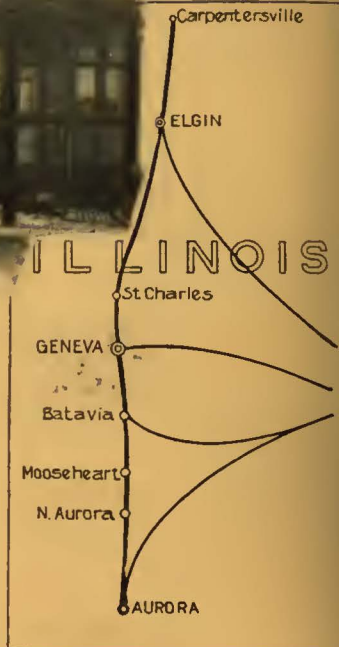
Recently there has been increased activity among interurban electric railways to augment their freight handling facilities. As a result, the Kuhlman Company is building the following C. E. R. A. Standard Trail Box Cars:

Michigan Railroad.....	15
Northern Ohio Traction & Lt. Co.....	25
Western Ohio Railway.....	10
Toledo, Bowling Green & Southern Ry.	10
Pennsylvania-Ohio Electric Ry.....	10
Total	70

Other companies considering increasing their freight handling equipment will recognize that much is to be gained by putting through additional cars at the same time.


**THE J. G. BRILL COMPANY**
  
 PHILADELPHIA, PA.  
AMERICAN CAR CO. — ST. LOUIS, MO. — G. C. KUHLMAN CAR CO. — CLEVELAND, OHIO. — WASON MAN'G CO. — SPRINGFIELD, MASS.

**Why not take advantage of this opportunity?**



More gross revenue—  
 Less operating expense—  
 Better public relations—

—All realized by the Aurora, Elgin & Fox River Electric Company

Operating costs\* per car-mile, 1924

Maintenance of way and structures.....	3.29 cts.
Maintenance of equipment.....	2.55 cts.
Power.....	4.35 cts.
Conducting transportation.....	12.15 cts.
Traffic.....	.34 cts.
General and miscellaneous.....	3.93 cts.
<b>Total.....</b>	<b>26.61 cts.</b>

\*Including costs of operating some heavy equipment.



General Electric equipment has been chosen for many of the recent outstanding, forward-looking car developments. It has helped to make many of the operating records which have established so conclusively the value of the modern light-weight car.

Modern Interurban Equipment

Total weight of cars.....	37,250 lb.
Motors (4-35 h.p.).....	GE-265
Control.....	G-E type K-35

How much would you profit by an increase in income resulting from an additional ½ passenger per car-mile and by a reduction in operating costs of 4 or 5 cents per car-mile? These things are possible with modern rolling stock.

# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL PRINCIPAL CITIES