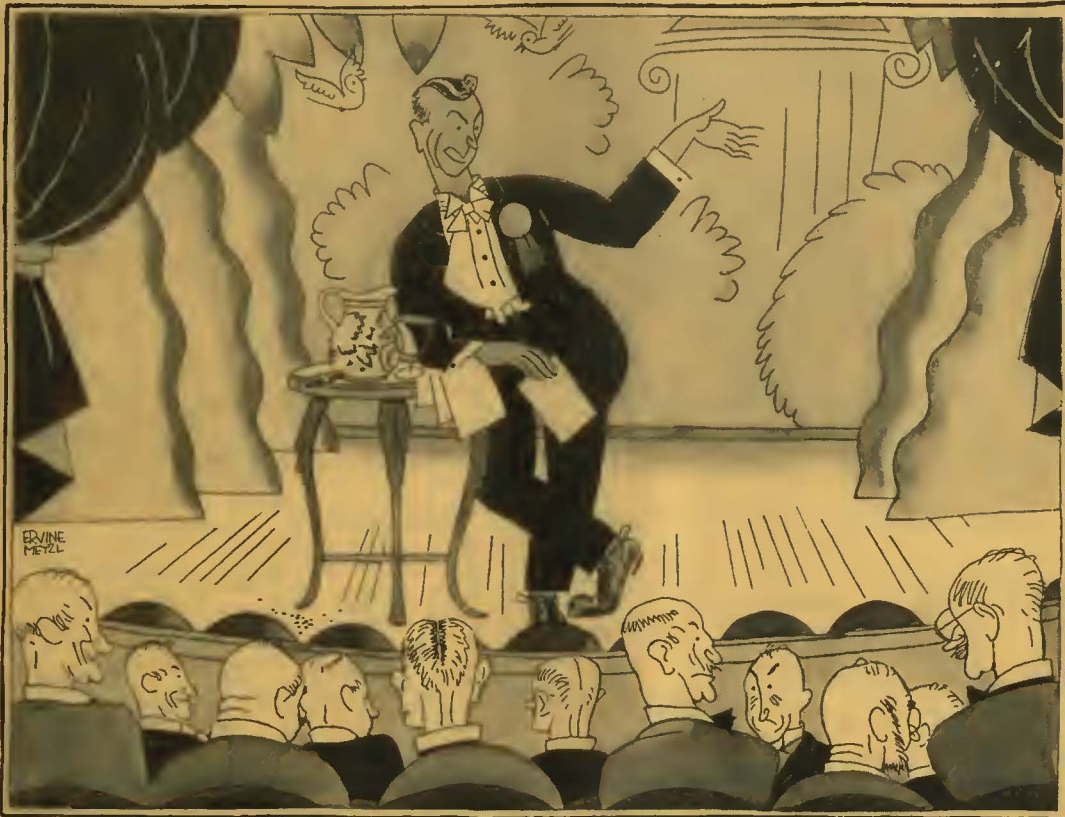


ELECTRIC RAILWAY JOURNAL



Convincing Conventions

AT THE A. I. E. E. Convention, held this month, keep an ear open for brush talk. If necessary, start some yourself. Any question will do, such as: "What brushes do you use?" The answer to that usually is a convincing "Nationals, of course." After you've had that

answer at any of these three conventions—N. E. L. A., A. I. E. E. and A. I. & S. E. E.—write, wire or phone us and we'll send one of our expert Sales Engineers to prove to you how convincingly superior is the performance of National Pyramid Brushes.

National Pyramid Brushes

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, INC.

Carbon Sales Division

Cleveland, Ohio

San Francisco, Cal.

Canadian National Carbon Company, Limited, Toronto, Ontario

Emergency Service Plants

CHICAGO, ILL.
551 West Monroe St.
Phone: State 6092

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NEW YORK, N. Y.
357 West 36th St.
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BIRMINGHAM, ALA.
1824 Ninth Ave., N.
Phone: Main 4016



Modern light weight cars of the Youngstown Suburban Railway operate between Youngstown and Leetonia, O.

Where Does the Modern City End?

DOES the modern city end where commerce leaves off? No. Reaching far out to green fields where roses bloom and patches of woodland dot the horizon—there are the cozy, modest homes where dwell the city's workers. For modern transportation broadens city borders. Miles that are shorter in minutes and cheaper, reach out along modern suburban trolley lines to sunshine

and air. Trolley equipment has kept pace with progress. Bright, inviting cars to merchandise transportation; lighter weight for greater comfort and economy; important refinements that keep cars on the road, producing revenue—such are the tools of the modern trolley line—tools that build business and profit through helpful community service.

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

Westinghouse

X88713



1926

The new light-weight cars of the Youngstown Suburban Railway Company are typical of modern cars that serve progressive suburban communities. Operated as one-man cars, they maintain schedules even better than the heavier two-man cars. Each is equipped with four Westinghouse 510A motors and Westinghouse control.

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Vol. 67
No. 23

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Keeping Up with the Procession

A WELL-KNOWN executive who has spent a long business life in local transportation service had this to say in a recent letter:

When I first went into the street railway business years ago I immediately subscribed to the JOURNAL and have been reading it ever since. That is a good many years ago. I have tried not to get to be a back number, and I know that I have kept abreast of the time to a large extent due to my perusal of the ELECTRIC RAILWAY JOURNAL. If all the men of the electric railway fraternity had read the JOURNAL and been governed by what has been published there, certainly many of the roads throughout the country would be in better shape today. It gives the facts to all of us who read, and if we do not profit it is our own fault.

This gracious compliment from a veteran of the industry is published with due humility and an increased sense of the responsibility with which the tremendous influence of such a reputation for wise counsel and clear vision is exercised.

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PHILADELPHIA, 16th and Parkway
CLEVELAND, Guardian Building
ST. LOUIS, Star Building
SAN FRANCISCO, 333 Mission Street
LONDON, 6 Bouverie Street, London, E. C. 4

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Service *must not* fail!

RUSH hour! Hungry, tired masses hurrying home, impatient at the slightest delay. Jammed streets—extra cars—sudden stops and quick starts—the severest test of the distribution system comes at the moment when it dare not fail!

That is just when the sturdy Westinghouse substation equipment shows its mettle. Westinghouse Converters

and M-G Sets are built for severe service—built to meet unflinchingly every service requirement—built to produce power to spare, with safety.

Tonight, and every night, as rush hour approaches, Westinghouse Converters and M-G sets are taking up their share of the railway load in nearly every city in the country—a general acceptance merited by continued leadership in design and construction.

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



Westinghouse

A Modern Trolley Base For Modern Cars

Balanced---and on Timkens

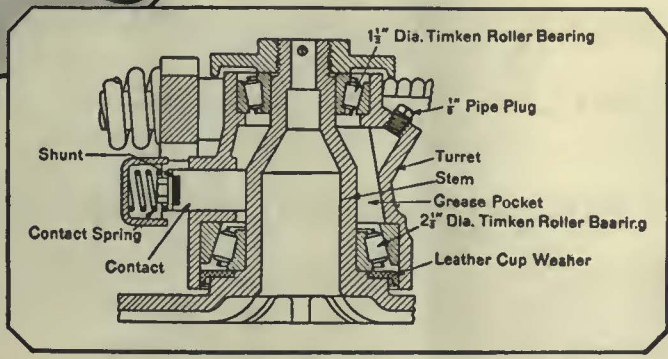
THE performance demanded of the modern car has given Master Mechanics and Overhead Superintendents the best of reasons for favoring the O-B Form 4 Timken Bearing Trolley Base. They must look to the economies of the most efficient equipment to realize fully the possibilities of new cars.

The O-B Form 4 Base lasts as long as the car, needs practically no care, and produces the minimum of wear and tear on the overhead. Its balanced spring assembly and the O-B application of Timken Bearings insure a uniform pole tension and a free and easy responsiveness to every variation of the overhead. Lost motion or wobble never develops in this base. It has a permanent perfect bearing.

Light in weight yet strong and compact in construction, O-B Form 4 Base is ideal for city and interurban cars. And its special Pedestal Contact Brush has ample capacity to carry the current necessary for operating a number of heavy electric freight cars in trains.

There are other reasons for the satisfaction which this Trolley Base has given on every railway where used. The details are interesting—write for them today.

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



Section of Turret Bearing showing position of Timken Roller Bearings and current contact.

Removal of cotter pin and cap nut permits removal of base from pedestal. A perfect application of two standard size Timken Bearings provides an ideal support for the base.

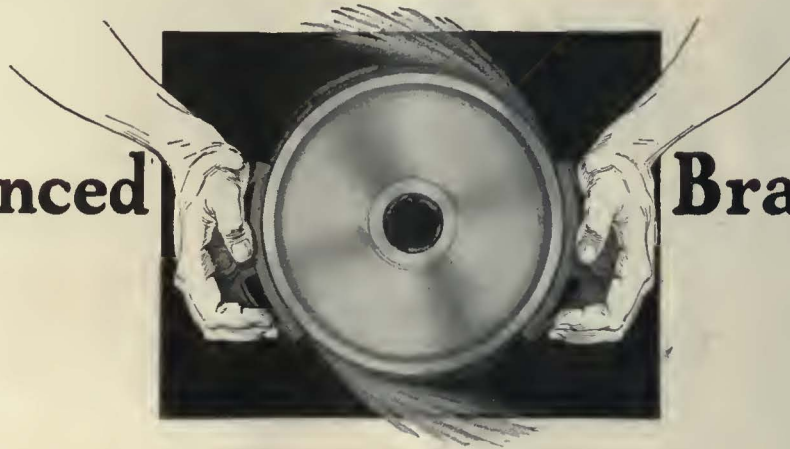


84C

Ohio Brass Co.



Balanced



Braking

Double the Braking Area—

Double it—and you decrease over 50% the required energy absorption per brake shoe.

Double the braking area and you greatly increase the friction coefficient.

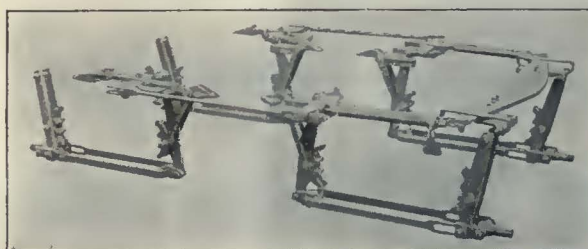
Double it and you can attain a higher rate of retardation.

Double it and you decrease the frequency of brake shoe replacements.

The "SIMPLEX AND AMERICAN MULTIPLE UNIT" clasp brakes with two brake shoes per wheel instead of one, doubles the braking area and accomplishes these results.

AMERICAN STEEL FOUNDRIES
NEW YORK CHICAGO ST. LOUIS

American Multiple Unit Clasp Brake





**Simple and Economical
Paved Track
Construction**

NOTICE the simplicity of a Twin Tie installation illustrated by this picture taken on Broadway, the Main Street of Mattoon, Illinois—

- Five men and a Foreman
- A concrete mixer
- A hose, tamping bars, shovels, etc.

With Twin Ties there is no gauging required—aligning and surfacing is simplified. The rail fastenings are put on with a sledge by any type of labor

The initial and ultimate cost of permanent steel tie construction is as much as \$5,000.00 a mile less than wood ties.

What Shall We Send You?

- Catalogue,
- Quotations,
- Proposal Drawing,
- Estimate, 1925 Detail Costs.

The International Steel Tie Co.
Cleveland, Ohio

Steel Twin Tie Track

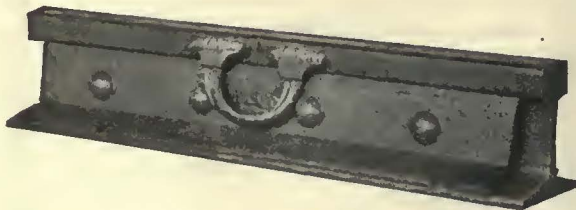
Renewable Track . . . Permanent Foundation



Type ATF-2

ERICO

My, but *these* rail bonds are easily installed



Type ATF-2 Installed



Type AT-R Installed

Both types ATF-2 and AT-R are easy to weld. Each can be furnished with single or twin cable conductor. The type AT-R is particularly adapted to narrow bolt spacing. Similar to type AT-R is type ATR-5, with a laminated conductor, which is a splendid bond for loose joints.

Type A-2 long cable bonds are used for cross and special work bonding. You can also inexpensively increase the capacity of your present bonding by installing them around the joints.

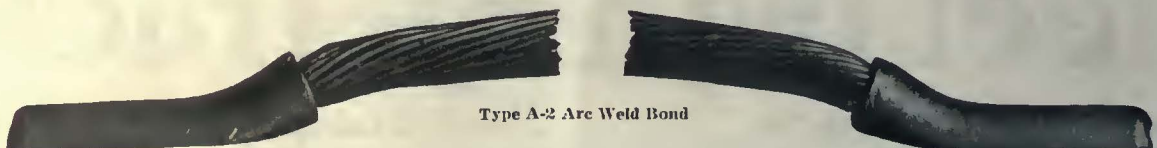
ERICO Arc Weld Rail Bonds merely require welding to the ball, or the base of the rail with the steel welding arc. The bonds fit the rail properly—no molds, no complicated clamps—just a light, portable welding outfit and one man who can do good arc welding. Only one supply required—a good grade of mild steel welding rod.

The technique of welding pieces of steel together with the electric arc is now well understood. It is not a difficult operation. Yet to make the welding of the steel terminals of ERICO Arc Weld Rail Bonds both certain and *easy*, the application of each bond type has been carefully studied by welding engineers who can and actually do arc weld.

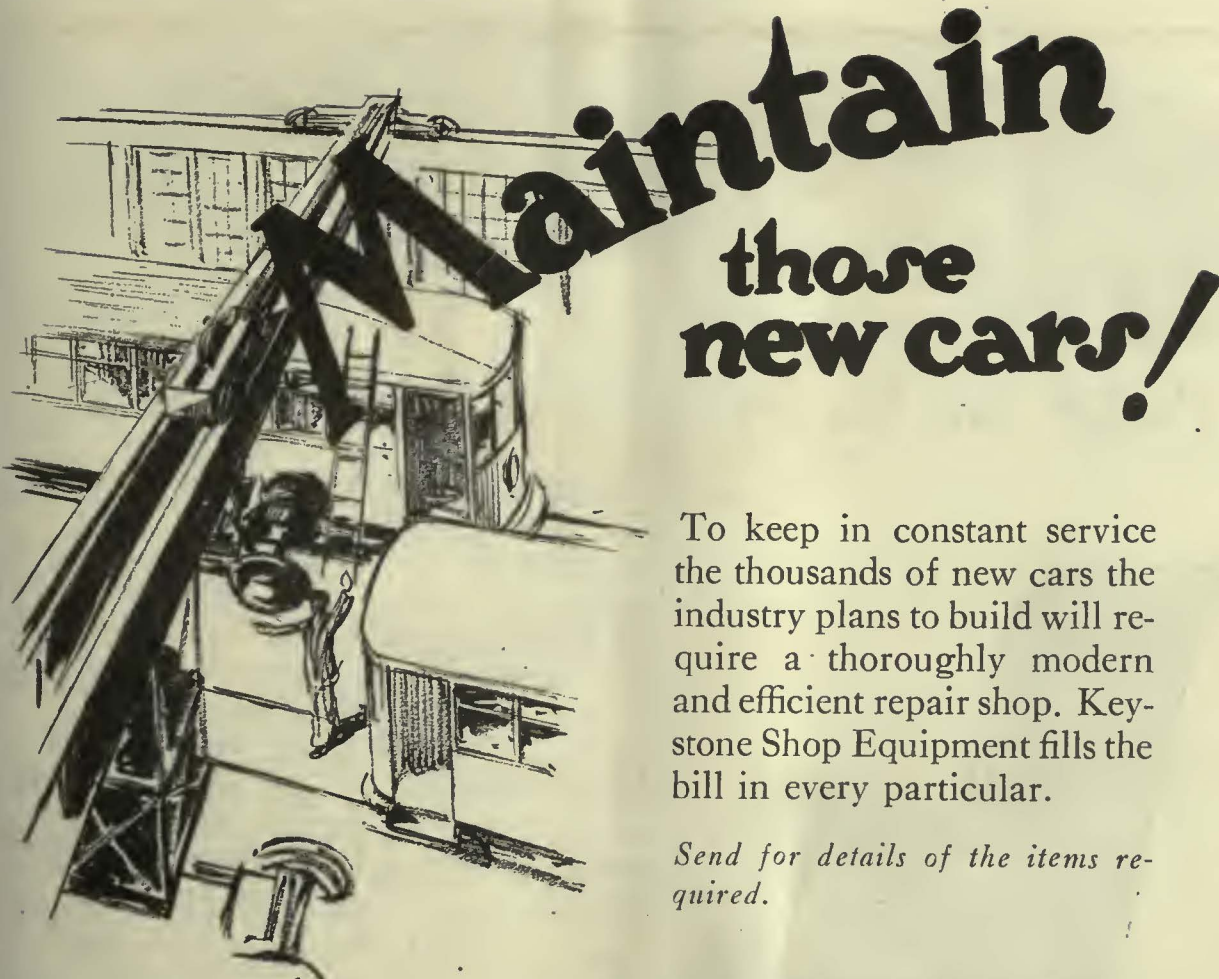
As a result you will find that every ERICO Arc Weld Bond terminal fits the rail in a manner which gives the bonder ample room in which to manipulate his arc, and insures, with the least possible effort, a solid homogeneous weld.

Your own bonders will quickly appreciate the easy welding quality of ERICO bonds. Circular No. 13 gives a wide choice of types. Tell us to whom and where to send the samples you wish.

The Electric Railway Improvement Co.
2070 E. 61st Place, Cleveland, O.



Type A-2 Arc Weld Bond



Maintain those new cars!

To keep in constant service the thousands of new cars the industry plans to build will require a thoroughly modern and efficient repair shop. Keystone Shop Equipment fills the bill in every particular.

Send for details of the items required.

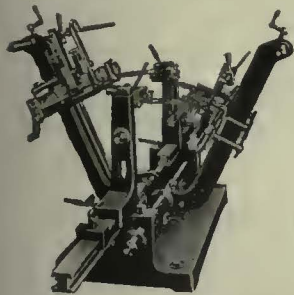
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KEYSTONE SHOP EQUIPMENT

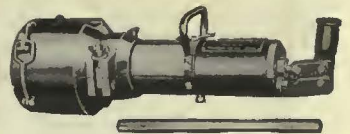
PARTIAL LIST OF SHOP SPECIALTIES

Segur Taping Machines
 Peerless Coil Spreaders and Winders
 Peerless Armature Repair Machines
 Electric Baking Ovens
 Century Type Testers
 Peerless Pinion Pullers
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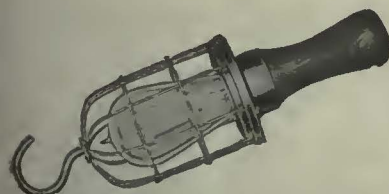
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 Portable Lamp Guards
 Simplex Jacks
 Reading Car Replacers
 Electric Drilling Machines
 Fountain Window Washers
 Keystone Sand Dryers
 Contact Rail Material
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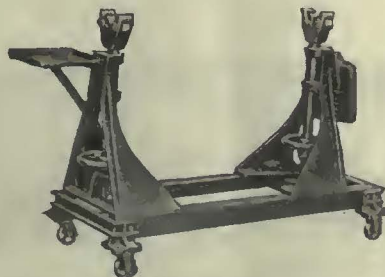
Peerless Coil Spreader



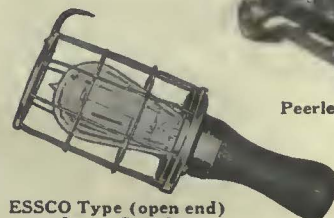
Peerless Pinion Puller



New Keystone Type Lamp Guard



Type A Armature Stand



ESSCO Type (open end) Lamp Guard



Peerless Pit Jack



Parlor Car luxury for real deluxe service



Type 15-A

Designed to meet the demand for luxurious travel comfort this Hale-Kilburn Revolving Parlor Car Chair provides luxurious comfort, yet occupies minimum floor space as it turns in a circle of $28\frac{1}{2}$ to $32\frac{1}{2}$ inches diameter. It has deep springs softly upholstered. Scientifically formed proportions and dimensions give perfect support and rest for the body. An ingenious device in the pedestal permits revolving with only normal effort, but prevents the chair from swaying with the movement of the vehicle.

Upholstered in leather, plush or other fabrics as desired, Pattern 15A, illustrated is especially adapted for the finest electric railway cars—Pattern 15 for de luxe buses.

Hale-Kilburn Seats of every type for urban, suburban and interurban service

From the simplest, most inexpensive standard rattan seat to the finest, most luxurious parlor car chair—you will find a Hale-Kilburn type to meet your requirements for both electric cars and motor buses.

To get complete descriptions send for our latest bulletins.

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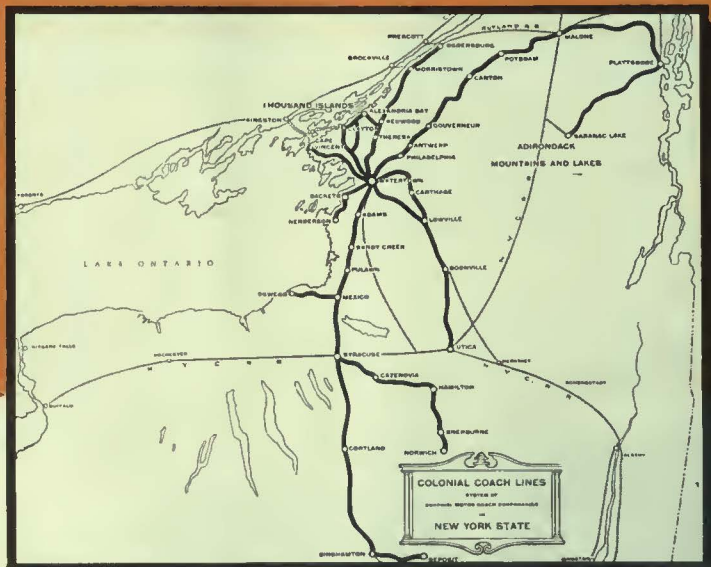
Hale and Kilburn SEATS



*Reducing
theories
to practice*



*How the Colonial Coach Lines
are putting Yellow Coaches
to the acid test . . .*



After covering 882,443 miles
Yellow Coaches write *their* own
 record of economical performance
 for *the* "Colonial Coach Lines"
 at Watertown, N.Y

"COLONIAL COACH LINES"
COLONIAL MOTOR COACH CORPORATION

EXECUTIVE DEPARTMENT

80 PUBLIC SQUARE

WATERTOWN, N. Y.

PHONE 2600

May 4, 1926.

Mr. John R. Ritchie, President,
Yellow Truck & Coach Mfg. Co.,
Chicago, Ill.

Dear Sir:-

Just a year ago 15 motor bus lines were combined under the operating name of the "Colonial Coach Lines."

The resultant system covers some 750 miles of route extending across New York State from Binghamton on the south to Plattsburg on the north and serving enroute the cities of Syracuse, Utica, Watertown, Ogdensburg and Malone.

With the advent of the new Company the former occupation of "running buses" disappeared and in its stead there became rapidly and firmly established a responsible transportation system with all of the reliability, attractiveness, comfort and service which the words imply.

During the year the public was gratified I am sure to find that maximum speed was reduced and yet running time between points was shortened; riding qualities of vehicles with other elements of comfort reached a point comparable with the very best that any other kind of transportation could possibly offer; hazards of travel were minimized; courtesy, personal consideration and service became everywhere apparent and we were ourselves gratified to realize also that net profits accrued steadily.

I feel it only fair on this, our anniversary, to tell you that the fleet of Yellow Coaches which we acquired from you at the start of our business has been literally an indispensable adjunct to these achievements and to our success. They have enabled us to reduce theories to practice, to convert policies to standards, to fulfill the desires of the public when and as they were ascertained.

Large as has been the part which your vehicles have played in our development still greater, to the minds of my associates and myself has been the value of the constant and splendid cooperation we have received from your Company and the members of its technical staff.

Please accept my deep appreciation of the pleasant association which we have enjoyed through this our first year of corporate existence.

Yours very truly,
HAROLD E. WEAVER.
COLONIAL MOTOR COACH CORPORATION.

HEW:EB

"The resultant system covers some 750 miles of route extending across New York State from Binghamton on the south to Plattsburg on the north and serving enroute the cities of Syracuse, Utica, Watertown, Ogdensburg and Malone. With the advent of the new Company the former occupation of 'running buses' disappeared and in its stead there became rapidly and firmly established a responsible transportation system with all of the reliability, attractiveness, comfort and service which the words imply."

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and Now — a Study of Colonial Coach Lines Cost *and* Operating Figures...

Watertown, N. Y., has some winters! Weather 20° and 30° below zero, snow and ice-bound roads—conditions that represent the most trying test on motor vehicles that can be imagined.

To prove Yellow Coach dependability on the road a check was made of the performance rendered by the fleet of 15 Yellow Coaches over the routes. This study was made over a six-months period, from October 1st to March 1st, when road and weather conditions were at their worst.

And how did Yellow Coaches come through?

Bucking the drifts, with icy cold in their teeth, the Yellow Coach fleet piled up a total of 364,646 miles *with only 82 involuntary stops—and these stops included every cessation of operation no matter how trivial or for how short a period.*

Out of 14,196 hours of operation *only 55 hours* were spent in stoppages as the total aggregate for all reason whatsoever outside of tires—a tribute to Yellow Coach ability to stand the gaff. In an operation of a standard of about

130 miles per day, in 3,000 days of operation (which is the equivalent of about 7½ coach years), only 55 hours were lost.

As an example of individual coach service, Coach No. 206 stopped twice only for a total of thirty-five minutes in 26,612 miles. Impassable road conditions cut off the fleet from inspections for long periods—but *Yellow Coaches kept going!*

Maintenance costs over the same period show equally strong records.

The total cost of the material for the *complete maintenance* of the vehicles over this operation of 364,646 miles, including inspections and repairs *amounted to only \$0.0239 per coach mile.*

These are figures that talk, when back of them is heavy going in deep snow, and over rough and icy roads. No major breakdowns of any sort occurred and there was complete absence of accidents of any sort due to defects of the vehicles.

Yellow Coaches write their own records on the road. Such records are reflected in *low-cost, profitable miles.*

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



WASHINGTON AVENUE AND 7TH STREET, ST. LOUIS.



“Keep Moving”

A slow moving transportation vehicle is no more to be tolerated these days, than street corner idling. St. Louis cars and cars in every other modern center are equipped with National Pneumatic Door and Step Operating Equipment which cuts down their standing time and keeps the traffic moving.

NATIONAL PNEUMATIC COMPANY

Executive Office, 50 Church Street, New York

General Works, Rahway, New Jersey

CHICAGO
518 McCormick Building

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

PHILADELPHIA
1010 Colonial Trust Building



Light weight
double truck
Safety Car
operated by the
city of
St. Petersburg
Fla.

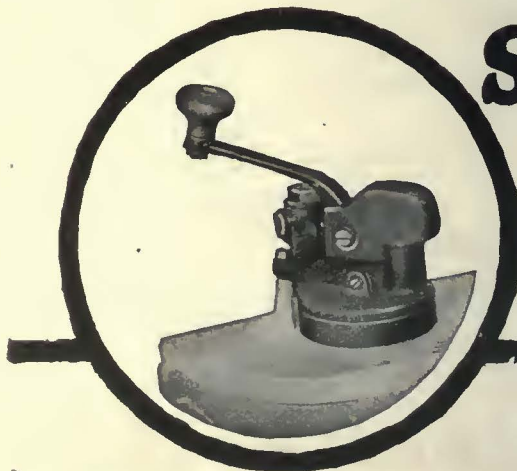
THE SAFETY CAR—

—is an exemplification of modern safety and economy in street railway equipment.

Safety Car Control Equipment interlocks the power, brake and door control functions to combine ease and convenience of operation with positive safety. Greater convenience is realized because both brakes and doors are controlled by the manipulation of a single operating handle, and because selective door control is possible. Greater safety is assured because careless or promiscuous door

opening is prevented, the car must be stopped before the doors can be operated, the doors must be closed before the car can be started, and release of the controller handle, through motorman's negligence or disability, cuts off the power and applies the brakes automatically.

Safety Cars bridge the gap between ordinary precaution and positive safety, stimulating public appreciation through the medium of safe, adequate, accelerated service that follows with the obvious economic advantages of Safety Car installations.



SAFETY CAR DEVICES CO.

OF ST. LOUIS, MO.

Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH



Peak Hour Economy

During peak hours, effective operation of ordinary brake equipment on modern light weight cars is diminished with the loading of commuting crowds—just when adherence to schedules is of the utmost importance. This condition is remedied by the

WESTINGHOUSE VARIABLE LOAD BRAKE!

During peak hours, schedules must be fast and consistent, especially through congested districts, to command passenger good will and patronage. This means that maximum speed must be maintained longer between stops than is possible without the

WESTINGHOUSE VARIABLE LOAD BRAKE!

During peak hours, every traction company counts its minutes saved collectively in terms of dollars. You can Save Money At Every Stop and get the utmost out of your rolling stock by using the

WESTINGHOUSE VARIABLE LOAD BRAKE!



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

WESTINGHOUSE TRACTION BRAKES



Many start but very few finish—

During the running of a good stiff steeplechase many a horse and rider fall by the wayside. They lack the ability and durability to stand this most gruelling test. Only the select ever finish the race.

And in the same way many a brake part fails to meet the severe requirements found in railway service.

But the Boyerizing Process to which Boyerized Parts are subjected enables them to last three to four times longer than ordinary steel parts.

Let them prove their ability by selecting and trying a few Boyerized Parts on your cars.



It's
Boyerized!

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

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Bushings

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McArthur Turnbuckles

BEMIS CAR TRUCK COMPANY

Electric Railway Supplies
SPRINGFIELD, MASS.

REPRESENTATIVES:

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W. F. McKennéy, 54 First Street, Portland, Ore.
J. H. Denton, 1328 Broadway, New York City, N. Y.
A. W. Arlin, 772 Pacific Electric Bldg., Los Angeles, Cal.

Signals and their Diversified Applications.

Have you more than scratched the surface to uncover available means of protecting and speeding up your traffic, and are you experiencing delays or perhaps accidents which might be eliminated by the use of one or more of the following means?



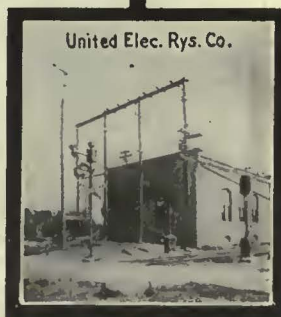
1.—Automatic semaphore or color light block signals, controlled by continuous track circuits.



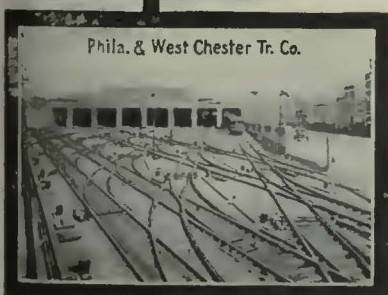
2.—Electro-pneumatic, electric, electro-mechanical, or purely mechanical interlocking systems at terminals or at grade crossings with other railway lines.



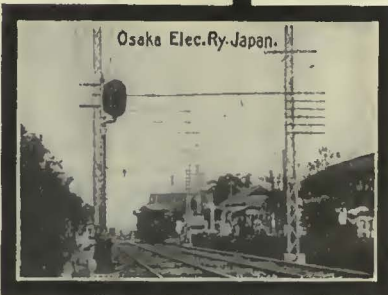
3.—Highway crossing protective devices of flashing color light, wig-wag and audible types or combination of same.



4.—Remotely controlled switches at outlying sidings.



A statement of your problem places you under no obligation and if it appears to our engineers that your conditions can be improved by installation of our materials, we shall be glad to furnish complete details.



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Pacific Electric Ry. Co.
Illinois Traction System
United Elec. Rys. Co.

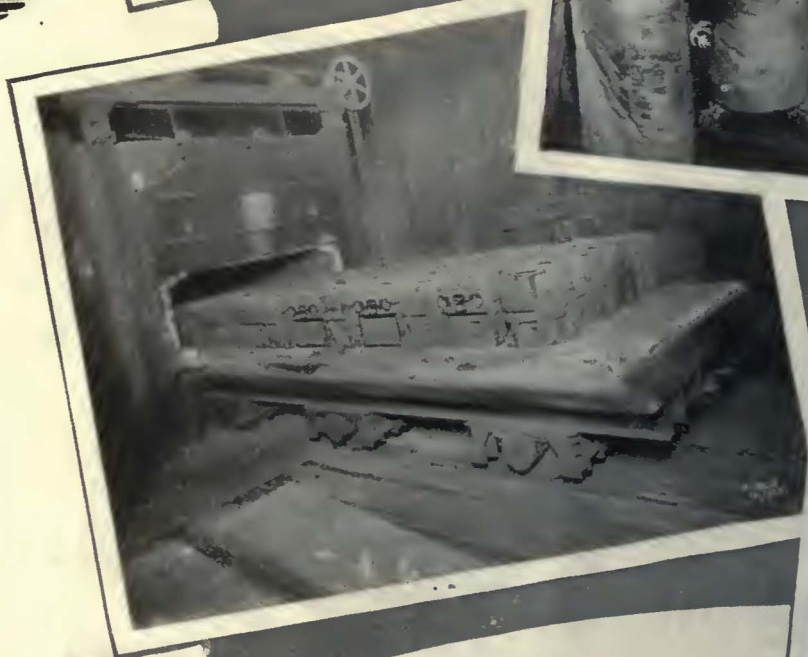
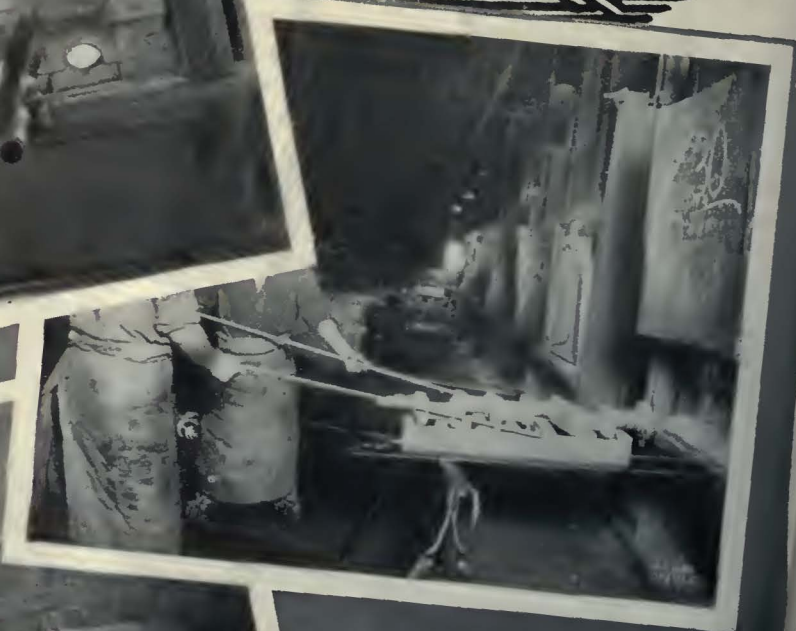
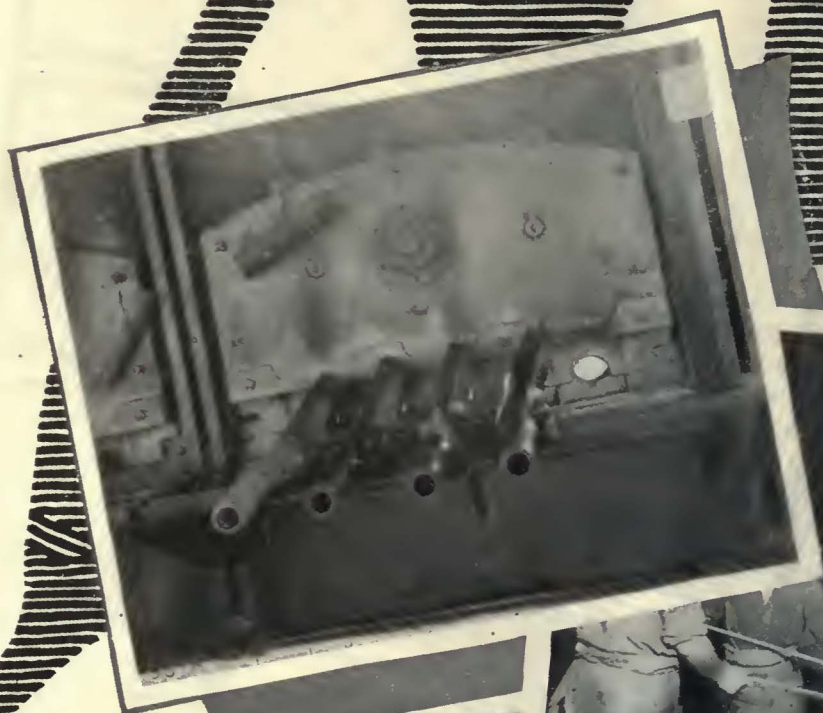
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The Bus
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Wherever heat treating is required Mack Does it —

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To control serviceable operation of the Mack bus on the road, Mack controls the processes which are so responsible for Mack performance.

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Malleable Iron — and thoroughly modern *for the GE-265 Motor*

This gear case possesses a unique feature—an overlapping joint, something new in malleable-iron gear case construction.

Overlapping of the halves keeps out dirt and moisture and affords a means of making adjustments to compensate for any wear of the supporting brackets.

This new gear case embodies the acknowledged advantages of malleable iron—rigidity and strength—yet its weight is no greater than that of the gear case formerly used with this modern light-weight motor.



General Electric is always striving to produce the most satisfactory railway equipment, as demanded by changing conditions and improvements in the industry. This new development, which makes possible the use of malleable-iron gear cases with GE-265 Motors, is a typical example.



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Modern Equipment Standards

54C-3

GENERAL ELECTRIC

Electric Railway Journal

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

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Interpreting Courtesy in Dollars and Cents

UNSATISFACTORY relations between utility management and its customers has been cited as sufficient reason for refusing an increase in rates. This unusual stand was recently taken in a decision of the California commission, which stated that the attitude of representatives of the company during the hearing was such as to lend color to the charges made by customers concerning the character of the business dealings of the applicant with them. "The evidence shows," the decision read, "that at the time of the hearing there were many prospective customers who were not using gas and that certain customers had ceased using gas because of unsatisfactory personal relations with the utility."

The order further pointed out that a sincere effort on the part of the owners to give satisfactory service and courteous treatment to customers would undoubtedly result in an increase in business and a thoroughly satisfactory return. Before renewing its application the company would be required to make a more satisfactory showing of improved public relations.

So evident is the moral of this unfortunate experience that it requires little comment. It is but another illustration of the saying that courtesy pays and discourtesy is likely to bring its own penalty.

Mr. Cobb Is

Demonstrating His Faith

MANY expressions of faith in the electric railway industry have been made by men high in its councils. Words of encouragement from important executives help to stimulate operating officials and their staffs to greater effort in meeting the daily operating problems, particularly on properties where the immediate margin between income and expense is lean and doubtful. Conditions in the industry, viewed in perspective, show a most encouraging trend, but it requires the continued assurance of those who see things as a whole to revive the spirits of the men immersed in the routine of an individual property.

It is, however, far more reassuring when expressions of confidence in the essential soundness of local transportation as an industry are backed with the courage to send good money after bad to provide the physical equipment and facilities with which to offer needed improvements in service. Consequently, the words of B. C. Cobb, vice-president Hodenpyl, Hardy & Company, Inc., and chairman of the Electric Railway Advisory Council, in a recent talk before the Rotary and Allied Clubs in Akron, Ohio, are particularly timely. "I have not," said Mr. Cobb, "lost faith in the electric railway business, for I am certain the people cannot do without electric railway service."

Similar statements have been made by others. In

many cases the speakers have likewise occupied positions of authority and responsibility which give their words the weight of mature judgment. But in the light of the policy followed on the properties whose destinies he guides, Mr. Cobb's statement commands additional attention. In this same light, his expression of faith is tempered with keen business foresight. Mr. Cobb not only expressed his confidence in the electric railway industry, he is demonstrating it!

He is demonstrating it in Akron, the rubber city, and his demonstration has just given unreasonable labor leaders the most serious setback they have experienced in years. In Grand Rapids street railway history is being made. In Chattanooga, Nashville and Evansville new cars are destined to put the railways in an entirely different position before the eyes of the public. He has made of the bus an ally instead of a competitor, and it proved a very valuable ally indeed in the recent strike in Akron. Mr. Cobb has not done all these things. But he has made them possible. He is helping to build confidence and determination in the mind of every progressive executive in the industry.

Ancient Jurist Throws Light on

Franchises and Certain Permits

IT SEEMS a far cry from the times of George III to the present, but Blackstone's definition of a franchise was quoted in a decision by the Nebraska Supreme Court in March, with others, to determine whether a permit to operate buses between fixed termini in Omaha was or was not a "franchise." The modern use of the word "franchise" in connection with the operations of public utilities may have given some people the idea that it is of recent derivation. Actually, its use goes back to the Middle Ages, when it implied a royal privilege in the hands of a subject. Blackstone's definition, written about 1765 and slightly condensed, is as follows:

"A franchise is a thing of interest and assignable and transferable. But a license is only a privilege to a certain person to do an act with impunity. When the King grants a market, he creates and grants a real thing; but when he gives liberty to trade, he does not create or grant a real thing, but only discharges or prevents a penalty inflictible for trading without leave."

The application of this principle in Omaha occurred because the city authorized the operation of certain bus lines without requiring this action to be approved by popular vote, as the law requires in the case of a "franchise." But in the ordinance, as passed, the city reserved the right to modify the provisions of such permit or to revoke it entirely, without redress or damages by the common carrier affected.

In its decision upholding the right of the city to grant these permits against the protest of the railway company, the Nebraska Supreme Court (208 N. W.

Rep., 123) declared that the ordinance permitting the use of motor buses to operate over certain routes as common carriers within the city "must be construed, not as a grant, but a regulation of a right pre-existing." In defense of this position, the court quoted the definition of a franchise already given, as well as definitions by other authors and by the United States Supreme Court. It then went on to declare that in view of its provisions the ordinance was simply the exercise of a power already existing in the city to regulate the traffic on the streets, even though the permit under which the buses operated as common carriers had many of the characteristics of a regular franchise.

Obviously, the same view may not be taken in other states. Thus, California takes the position that any use of the public highways of the state for commercial purposes is a privilege which can be permitted to some users and withheld from other persons at the pleasure of the Legislature of the state. Under this ruling, the right of the Legislature to define common carriers and specify the use they can make of the highways has been confirmed by the California Supreme Court.

If Louisville Would Achieve Its Ambition

LOUISVILLE hopes to achieve greatness. That is a laudable desire. Nobody will be found to quarrel with the city on that score. But it is trying to achieve that end while at the same time disclosing a disposition to hamstring its street railway. The two do not go together. Cities do not grow despite their street railways. They grow because of them. A starved creature of any kind is a pretty poor recommendation for its keeper. The city that starves its street railway in the sense that it is too parsimonious to permit its railway to grow and expand deserves the stigma that attaches to the emaciation which its railway is sure to reflect in the extent and character of the service that is supplied.

All the Louisville Railway wants is a fare that will permit it to grow. And it is entitled only to that. So far as the company is concerned it can get by on its present rate. But getting by is not the end of things. Nobody worth while subscribes to any such doctrine. And the Louisville Railway is very much worth while—much more worth while to the city than it is to itself, which in the last analysis is the stockholders.

Money for investment has to be attracted into the channel that gives promise of return commensurate with the risks involved. That is elementary, but it is fundamental. It is a truism that Louisville needs to ponder and reflect. That city should consider the recent experiences of Cleveland and Dallas, in both of which constructive amendments to franchise grants have been made after a vain attempt to evade the simple mathematical formula that nothing from nothing leaves nothing.

The old story holds true of the fellow who equipped his horse with green goggles and then fed him on shavings. The horse died. Boosting Louisville industrially will do no good if its street railway reflects emaciation imposed from without. All the railway asks is that the city be just, not generous. The day of inordinate profit in the public utility field—and as a matter of fact even that idea has been greatly overworked—has gone, never to return. This is not something that is debatable.

It is a fact. Business men of Louisville appear to sense and appreciate this. It is high time that others also began to see the light. Until they do Louisville may carry on, but it will never achieve the civic, industrial or social heights to which it justly aspires.

Far-Sighted Management Needed to Prevent Unwarranted Destruction

EVEN though the electric railway industry as a whole has turned a corner in its progress there are still many individual properties so hopelessly involved that their continued existence is extremely doubtful. The unfortunate situation is that these backward properties cast unwarranted reflections on the industry at a time when the general public and many more closely identified with the industry find it all too easy to throw up their hands.

There comes to mind a property once taking in \$1,000,000 gross annually. It was financed badly and operated by its directors with the ultimate hope of selling at a profit. It had many bond issues. These were allowed to exist without making provision for retirement or for refunding. The management was more interested in finance than in service, and the public relations suffered until the property had little or no standing in the community it served and from which it drew its revenue.

Then the fight for bus supremacy came. The property did not have the help of the community because it had not deserved it in the early days. Even though the management changed hands the old stigma remained. Justly or not, the reputation seems to remain firmly attached to the physical property rather than the personnel or its ideals. Again, the state public service commission was poorly advised by one of its employees, and an independent got a permit to operate competitive bus service through a tragedy of errors. In all too brief a time the buses gained a third of the railway revenue. This was done in the usual manner of taking a great part of the base load away from the railway and leaving the unprofitable surplus peaks for it to handle.

Receivership followed in the early stages of this competition, after which still further losses of riders to the buses took place. This made it impossible to maintain a satisfactory cash position without too great a curtailment of maintenance expenditures. What chance exists for a reorganization plan among interests that have no concern with transportation or service? The bondholders' committees representing the several underlying issues are only concerned with recovering their own money. Some of the smaller issues are the senior securities on certain sections, and unless they can be paid off at par their owners see an opportunity to get out whole through the sale of their portion of the rails and cars for scrap. Transportation means nothing to them; service to the community is of no interest. Nor can they be blamed for this viewpoint. It is just an unfortunate result of a failure to grasp the situation in time. Today, the whole system, once a successful property, may go on the junk pile at 10 to 20 cents on the dollar and the communities served will lose a valuable servant.

The burden of providing with buses all the transportation requirements of the community throws the mantle of responsibility on new and inexperienced shoulders. This is an entirely different situation than

that of carrying only the cream of the traffic built up through a quarter of a century or more. The outcome will be interesting, but the experiment may prove costly to the community at a time too late to retrace its steps. The newspaper headlines will say "Railway Abandons Service" or "Buses Supersede Obsolete Railway." "Wrecked by Poor Management and Uninformed Public" would more accurately reflect the facts.

Buses Do Their Bit in Akron

IN THE case of an agency so new and undeveloped as is the bus in the transportation field it is dangerous to draw sweeping conclusions from experiences in isolated instances.

Akron now occupies the center of the bus stage again. This time the bus has more than held its own in furnishing an emergency service that went a long way toward breaking the back of the recent street railway strike. Even before the strike, almost an equal number of street cars and buses were in use. During the early stages 210 buses were run for emergency purposes, 58 of which were in interurban service. In addition, 100 trucks were being used by the local railway to handle its freight and express.

Thus it becomes evident that discussion of the physical capacity of buses to handle the transportation requirements of cities of one size or another leads nowhere. In the previous strike, unorganized bus service failed miserably. In the present emergency, better organization and better equipment permitted them to make a much better showing. The first attempt was an effort by an uninformed city administration to prove that buses could furnish transportation service at a 5-cent fare when the railway claimed that adequate public transportation required a higher rate. This second emergency use of the bus was to maintain transportation service on the part of an organized and responsible agency in the face of an unwarranted refusal by its car employees to continue their work.

Many unwise sweeping conclusions as to the physical limitations of bus service were drawn from the previous Akron experience. The proper place of the bus and the car will be settled on economic grounds. The question of physical capacity is and always will be a secondary one. There has been too much loose talk on both sides of the bus-car question and too little sincere effort to determine and develop the field for each vehicle.

Too Much Caution and Not Enough Speed

SO MUCH prominence has been given in the last few years to the "safety first" idea that the perspective of some railway operators has become distorted. The continual preaching of "safety first" sometimes has instilled a spirit of over-cautiousness, which has resulted in too great a reduction in the speed of car operation.

From the humanitarian standpoint, safety can hardly be overdone. No effort is too great to avoid accidents resulting in personal injury. It is not so much from this source, however, that the impetus for safety campaigns on the electric railway has come as it is from the desire to reduce the money cost of accidents. A minor collision may require the payment of damages for

a bent mudguard or a broken windshield of somebody's automobile. In the aggregate, these payments often amount to a sizable sum, even for a railway of medium size. Claim departments have made tremendous, and frequently very successful, efforts to cut down expenditures of this sort.

In the accomplishment of this end, however, another element of primary importance may have been lost to sight. The public demands speed. If electric railway service is slow, people will seek other means of transportation—safe or otherwise. Loss of revenue from this source easily may amount to more than the saving made by the claim department.

To get away from the tendency to sacrifice speed to cautiousness, it is not necessary to operate the car along the streets like a juggernaut. This was not done before the advent of the automobile and the consequent safety campaigns, nor need it be done now. A car can be operated speedily while under reasonable control. The motorist should exercise his share of caution, too, not leaving it to the railway to do all the thinking about safety. By this means, the transportation service will be improved and the accident hazard will be reduced rather than increased.

Who Is to Blame for Failure of Effective City Planning?

CONCERNING comprehensive plans for civic improvements, particularly those involving transportation facilities, it might be aptly said that many are made but few are carried out. Why is this so? Usually, it is in part the impracticability of the proposed plans that prevents their execution and in part the difficulty of overcoming the inertia of things as they are.

Often the theorists and the realists fail to get together because neither group realizes the importance of the other. The civic planners have a tendency to consider the practical transportation men as "lowbrows," and the latter reciprocate by regarding the planners as impractical "highbrows."

It is all very well to make idealistic plans for future transportation facilities, but first they must be built and then they must be operated. That means that they must be feasible from the construction standpoint and reasonably promising from the financial standpoint. Ideas of the experienced local transportation men usually will be found invaluable in mapping out a sound, practical program. Those charged with the preparation of plans for the future make a serious mistake by not availing themselves to the full of this fund of useful information.

On the other hand, it must be admitted that many transportation men fail adequately to appreciate the value of what the planners are doing. They are skeptical about so much theoretical discussion. Such an attitude is a mistake, too. While the plans may be imperfect, they are, nevertheless, an attempt to regulate development in the right way rather than allowing it to proceed haphazard. Much of our existing congestion could have been avoided by careful planning years ago. Planning now for the future is absolutely necessary if our next state is not to be worse than our present.

For best results, therefore, the theorists and the realists must work together. The latter will temper the plans with common sense and the former will instill a touch of idealism which should eventually result in greater achievement.



This Latest Division of the Austrian State Railways to Be Electrically Equipped Passes Through a Section of Wonderful Scenery

Austria Extends Electrification

Two Important Lines on Mountain Sections Involve Serious Problems in Insulation and Overhead Line Construction—Single Phase at 15,000 Volts and 16½ Cycles Is Used

WHILE Austria as a country is much smaller than it was, it has gone courageously ahead with the electrical equipment of those portions of its State Railways for which the advantages of electrification are especially pronounced. One principal reason for this policy, of course, is the abundance of water power in the mountains of Austria, especially in those portions of the Alps in the southern and western parts of the country toward Switzerland and Italy.

Two of the latest divisions of the Austrian State Railways to be equipped with electric power are the Arlberg line and the Salzkammergut line. Both traverse mountain ranges and have extended tunnel sections. Their locations are shown on the accompanying map. In the following account of these lines information has been combined, received from the railway authorities and from an article in *Electrotechnik und Maschinenbau* by Ing. Hugo Luithlen of the electrical department of the Austrian State Railways.

THE ARLBERG LINE PART OF A THROUGH ROUTE

As will be seen, the Arlberg line connects Innsbruck in the Tyrol and all of Austria east of that city with the extreme western part of the country which borders on the upper Rhine Valley and on Lake Constance. Thus this line forms a part of a through route from Vienna to Switzerland and thence via Zurich and Basel to Paris and London. This line was opened with steam as a motive power in 1884, when the 6½-mile tunnel

under the Arlberg (a mountain in the Austrian Alps) was completed.

With the improvements made in electric traction, its merits and economy for an installation of this kind became increasingly apparent. Finally contracts for the electrical equipment of the Arlberg line from Innsbruck to Bludenz were awarded. As the electrification was for a section of track already built, the work required to complete the necessary hydro-electric power development took the longest time, but in 1925 the undertaking was finally accomplished. The time-table for the summer season of 1925 provided for a de luxe train via this route, running three times a week, with through cars from Vienna to Paris and Calais, with a running time between Vienna and Paris of 25 hours. In addition there were five passenger trains daily each way over this route, three of them carrying through cars scheduled as far west as Zurich and Paris, with an equal number of trains going east, carrying through cars as far as Vienna, Warsaw and Budapest.

The distance from Innsbruck to Bludenz is 136 km. (85 miles). Measured as single track the division consists of 196.1 km. (123 miles).

HYDRO-ELECTRIC POWER STATION

The hydro-electric power station for this section, known as Spullersee Station, is located in the Vorarlberg region at the western end of the line and utilizes a head of about 2,880 ft. from Spuller Lake. The sta-

tion contains at present three 8,000-hp. units and has a capacity for twice that output. The second station is at Ruetz, south of Innsbruck, and toward the eastern end of the line. It was built for commercial purposes before the electrification of the Arlberg line, but has been extended so as to supply the additional power required, particularly in the summer, by the Arlberg Railway. Its capacity is 8,000 hp. The two stations are connected electrically by a tie line with a voltage of 55,000.

It is at this voltage that single-phase, 16½-cycle energy is distributed to the four substations.

TRANSMISSION LINES

Located as these power lines are in the Alps, at altitudes varying between 3,000 and 6,600 ft. above sea level and traversing regions subjected to the most severe winter climate, some unusual methods of construction and maintenance had to be used.

The transmission lines are carried for the most part on steel towers, set in concrete block foundations, but to some extent reinforced concrete poles of double-T cross-section are used. With these latter poles, a special hole was left in the web of the pole at approximately its center of gravity, so that with the aid of a special portable hoist the setting of these poles was much simplified.

The average spacing of the towers on level sections is 500 ft., with the transmission wires 16½ ft. apart, but this spacing of the wires was increased to 26 ft. in the long spans of 800 ft. Suspension insulators of three or four units were installed on the majority of

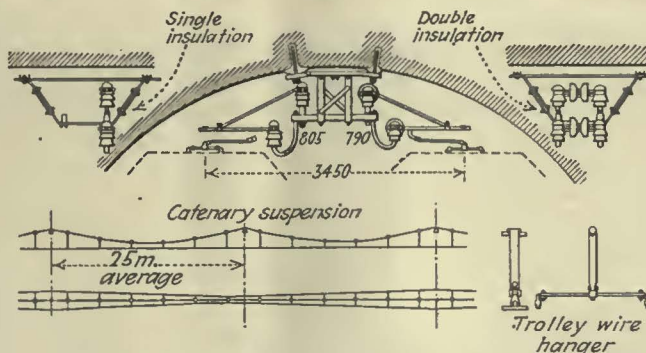


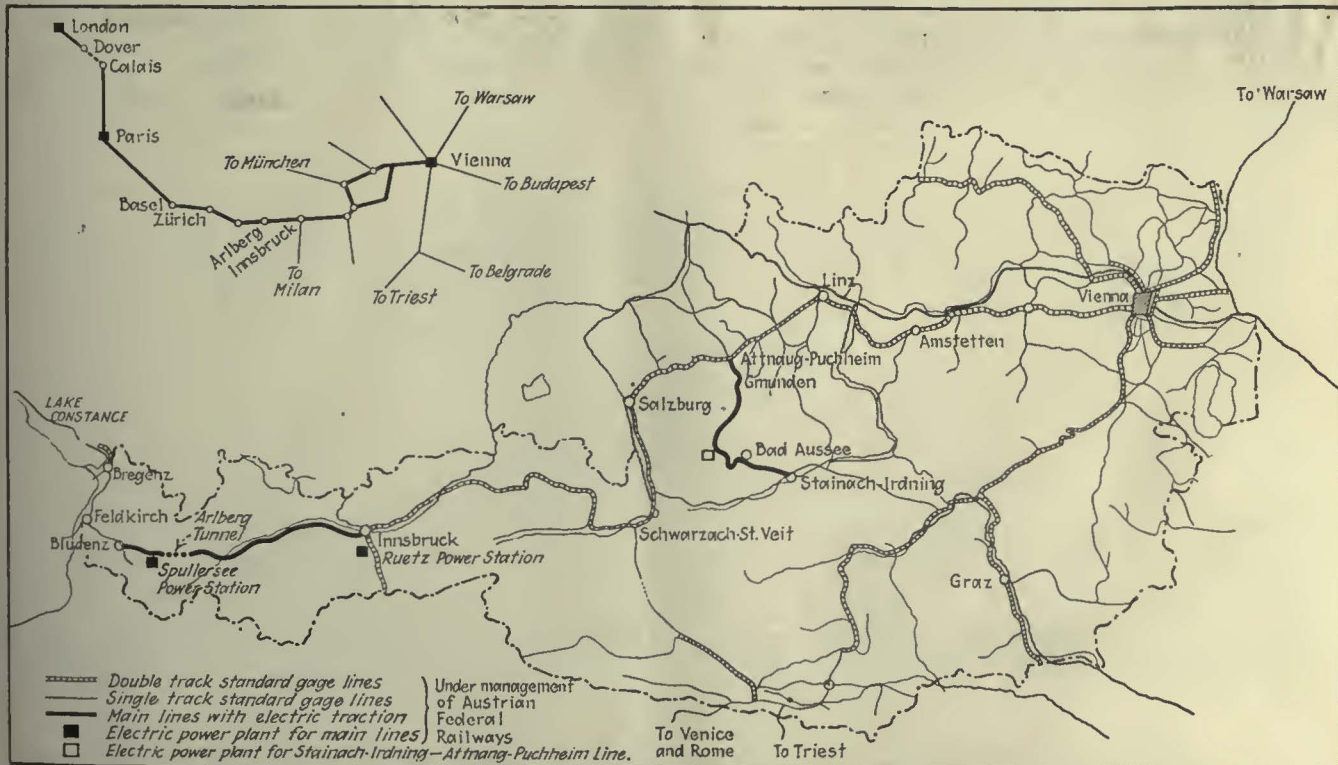
Diagram of Construction in the Tunnel. The Dimensions Are in Millimeters

the towers. These insulators, before being installed, were tested with 110,000 volts under oil and 125,000 volts in the air. Mechanically, the type of insulator used has a strength of 7,500 lb. Wherever highways, railways or rivers had to be crossed a double set of insulators was employed for each transmission conductor.

Part of the transmission line is carried at a considerably higher altitude than the railway, because when the tunnel under the Arlberg is reached the transmission line is carried over the mountain rather than through the tunnel. This was done because experience with underground cable construction had not been advanced sufficiently at the time of the construction of this line to warrant the engineers in recommending the use of a cable built for 55,000 volts. In consequence, the transmission line reaches an altitude of 6,600 ft.

Unusually heavy steel towers, most of them on concrete foundation rising to a height of 12 ft. above the ground, were installed on this section of the line. Experienced mountain guides were consulted by the erection engineers, so that the towers would be placed at points where there was a minimum of avalanche danger. The average distance between towers was here reduced to 450 ft., and some of the line sections are so steep that two adjacent towers which are 550 ft. apart have a difference in elevation of 340 ft.

To withstand safely the high winds and heavy sleet to which this line is exposed bronze wire was used with suspension insulators having a mechanical strength of 17,000 lb. The Austrian rules on safe line construction prescribe that a transmission line must withstand



Though Restricted in Territory, Austria Is Carrying Forward Main Line Electrification. Two Important Divisions Recently Electrically Equipped Are Shown on This Map

a wind pressure of 125 kg. per square meter, but on this installation the possible strain used in the calculations was increased from 125 kg. to 150 kg.

The maintenance of this mountain section of the transmission line has been intrusted to picked crews of linemen, all of whom are expert on skis. They have their headquarters and keep their maintenance supplies in a hospice located near the top of the Arl Mountain.

Over the entire length of the line a stranded steel wire is carried for lightning protection.

DISTRIBUTION AT 15,000 VOLTS

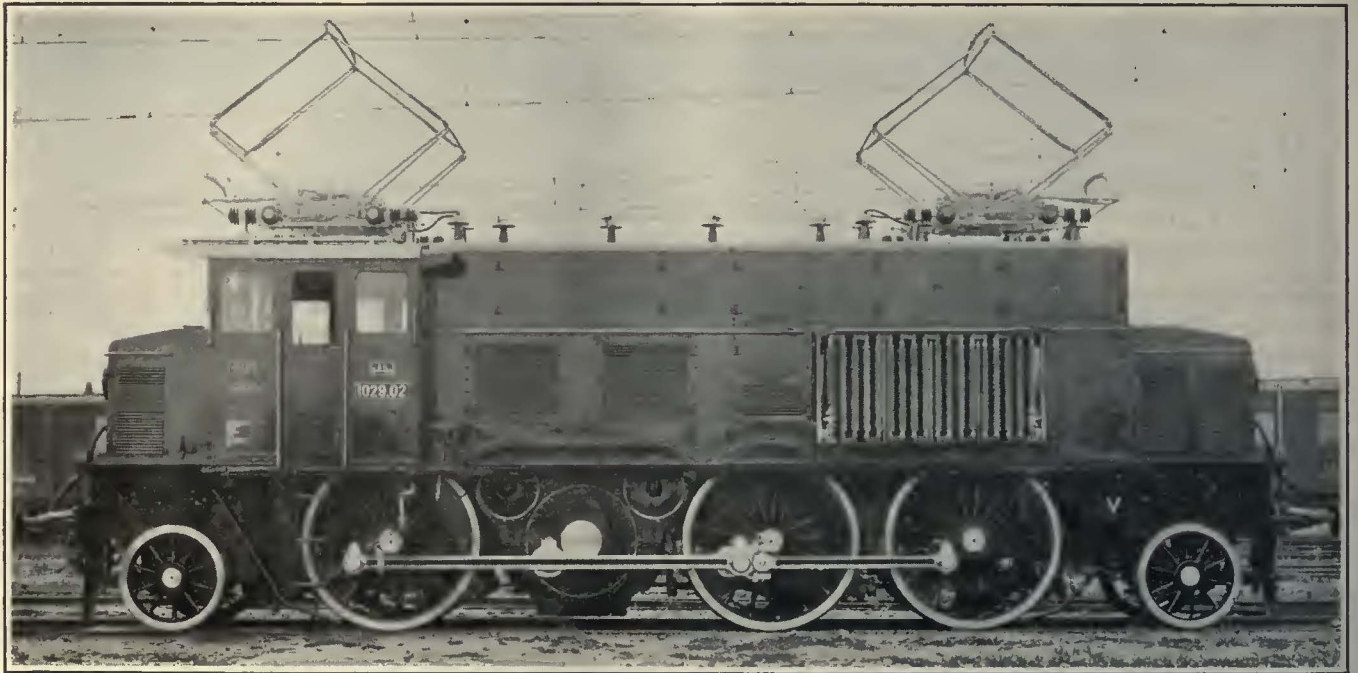
Each substation is equipped with two single-phase, 55,000/15,000-volt transformers, and it is at the latter voltage that the single-phase energy is put on the overhead lines.

Each of the four transformer stations supplies its own section of overhead line. At the end of each section are circuit breakers, by which one section of overhead

The supports for the catenary construction are placed at an average distance of 250 ft. apart. Practically all of the poles are of steel, though a few sections of track have wooden or concrete poles. For the entire installation, except in the tunnels, a minimum distance of 10 in. has been established between ground and all parts carrying the trolley voltage of 15,000. This distance has been reduced at certain points in the tunnels to 6 in.

When carried over tangent track the working conductor is zigzagged plus and minus 18 in., so as to distribute wear on the pantograph. The height of the working conductor over the rails in the open averages 20 ft., but in the tunnels this distance is reduced to 16 ft. Whenever a change in the height of the trolley wire is necessary, such as when a tunnel entrance is approached, the change in elevation of the wire is not permitted to exceed one in 300.

Insulation of the entire overhead line construction



Passenger Train Locomotive on the Arlberg Division

line and its parallel feeder may be separated from those of the adjacent section. In addition, the overhead line at each of the 25 passenger stations along the route is so connected that the section at the station may be cut out of circuit in case of local trouble, the continuity of the general line being preserved by a jumper line installed around the passenger station. All of the electrical switches for this sectionalizing at each passenger station are in a special switching tower, which is kept doubly locked. The inner lock is so arranged that its key can be withdrawn only when the switches are opened.

The key for this lock is kept by the station master so that the section of overhead line around a station can be de-energized when necessary only by some authorized person.

The side tracks at all stations are normally dead and must be energized by the engineer of the electric locomotive before he enters them. When the overhead wires at a station are "killed" an automatic interlock closes the semaphore for that section so as to block the entrance of trains into the station.

against ground is double; that is to say, wherever the line is supported there are always two insulators between the wire and ground. Where public highways are crossed and in all switch yards rupture-proof suspension was chosen. Large steel objects on the right-of-way, such as bridges and trestles, are permanently connected by bonds to the rails.

WORKING-CONDUCTOR

The trolley wire or working conductor is of figure 8 cross-section. When this section was under consideration, objection was made that such profile is apt to be made soft in the drawing process when made from a round cross-section. This was overcome, however, by rolling the section from rolls made for the purpose. Early in the work a few of the yards were equipped with steel trolley wire instead of copper to save expense, but this plan was abandoned on account of the resulting wear on the locomotive pantographs.

Two methods were followed on different sections of the line for insulating the steel standard catenary cable. On one section of the line use is made for this purpose



No. 1. A Typical Anchor Tower In a Switch Yard on the Arlberg Line. On This Section the Overhead Line Uses Suspension Insulators

No. 2. The Transmission Line of the Arlberg Division Reaches at Times to Higher Altitudes than the Railway

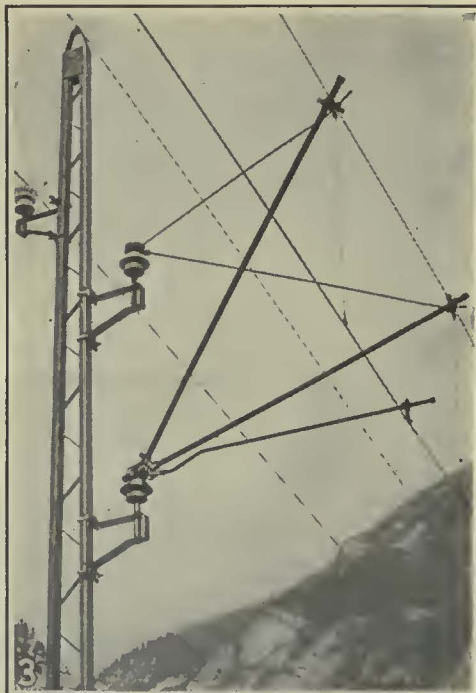
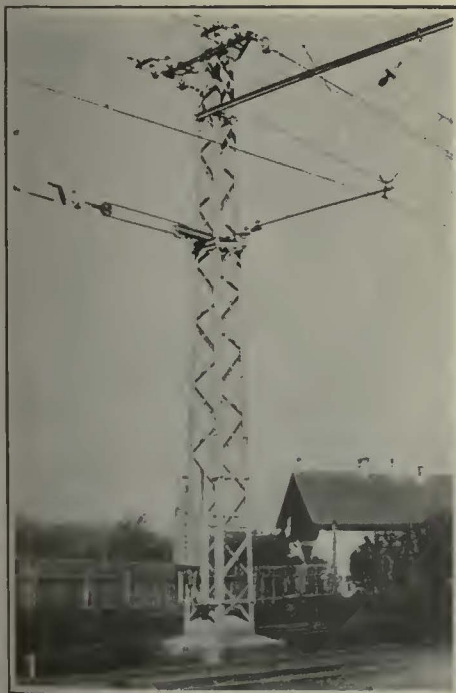
No. 3. The Transmission Towers Are Mounted on High Concrete Bases, at Points Where the Snowfall is Likely to Be Heavy

of the suspension type of insulators. The catenary itself, on this portion of the line, consists of a standard cable of 49 zinc-coated steel wires, each 1 mm. in diameter, to which the vertical hangers are fastened at intervals of 16½ ft. These hangers are 4 mm. galvanized steel wires, and galvanized steel bolts and brass nuts are used throughout. In long, level portions of the double-track line the poles carry brackets to which are attached the insulators for the catenary cable and also at times an outrigger bracket arm or pull-off for the purpose of steadying the position of the working conductor.

and spool type are used. They were tested to withstand 115,000 and 130,000 volts (under oil and air flashover respectively) and each is made from a single piece of porcelain. On these sections the catenary cable is made up of seven galvanized steel wire strands, each 3 mm. in diameter. The hangers are made of 5 mm. steel and instead of supporting the working conductor directly, their lower ends are attached to an auxiliary catenary or carrier cable of 6.5 mm. solid steel, from which the working conductor is supported. All clamps, bolts and nuts are bronze.

On the second section of line, insulators of the cup

In both of these forms of construction special means are used, except in the tunnels, to maintain a constant



No. 1. A Typical Anchor Tower on the Salzkammergutbahn, Showing Also the System of Counterweight by Which the Trolley Wire is Kept Taut

No. 2. Type of Construction Used in the Tunnel of the Arlberg Line, Where Precautions Must Be Taken to Guard Against Moisture

No. 3. The Salzkammergutbahn Overhead Construction is Also of Two Types. The One Shown Elsewhere Illustrates One Type. The Other is Illustrated Above



Hinged Bracket or Pull-Off as Used in the Section Equipped with Suspension Insulators

tension on the trolley wire. This is accomplished, as in other European installations, by dividing the working conductor into sections and keeping it taut by counterweights. In the 6½-mile tunnel the temperature is so nearly constant that it was not considered necessary to use any method of keeping the wire taut by counterweights.

OVERHEAD CONSTRUCTION IN TUNNEL AND BONDS

While overhead construction in the tunnel was simplified in the respect just mentioned, in other respects it presented many problems, notably because of the limited room and excessive humidity. Some accompanying views show the method followed of supporting the wire in the tunnel.

Over each track were strung two trolley wires, each 65 sq.mm. in section and 16 ft. above the top of the rail. These conductors were supported on special hinged brackets, as illustrated. The catenary cable is of bronze to prevent rusting. The steel used for the fittings is all-coated by the zinc spray method, and while final results have not yet been obtained, it appears that this method has not come fully up to expectations. Suspension points are every 60 to 90 ft. In the middle of the tunnel the lines can be disconnected by oil switches installed in a suitable chamber.

Various types of rail bonds are being tried. At present tests are being conducted with welded bonds.

This problem is not yet considered to be solved in a satisfactory manner.

To aid in the maintenance of the line, one gasoline-electric work car is now available and three more have been ordered.

THREE TYPES OF LOCOMOTIVES USED

Three types of electric locomotives are used on the Arlberg line:

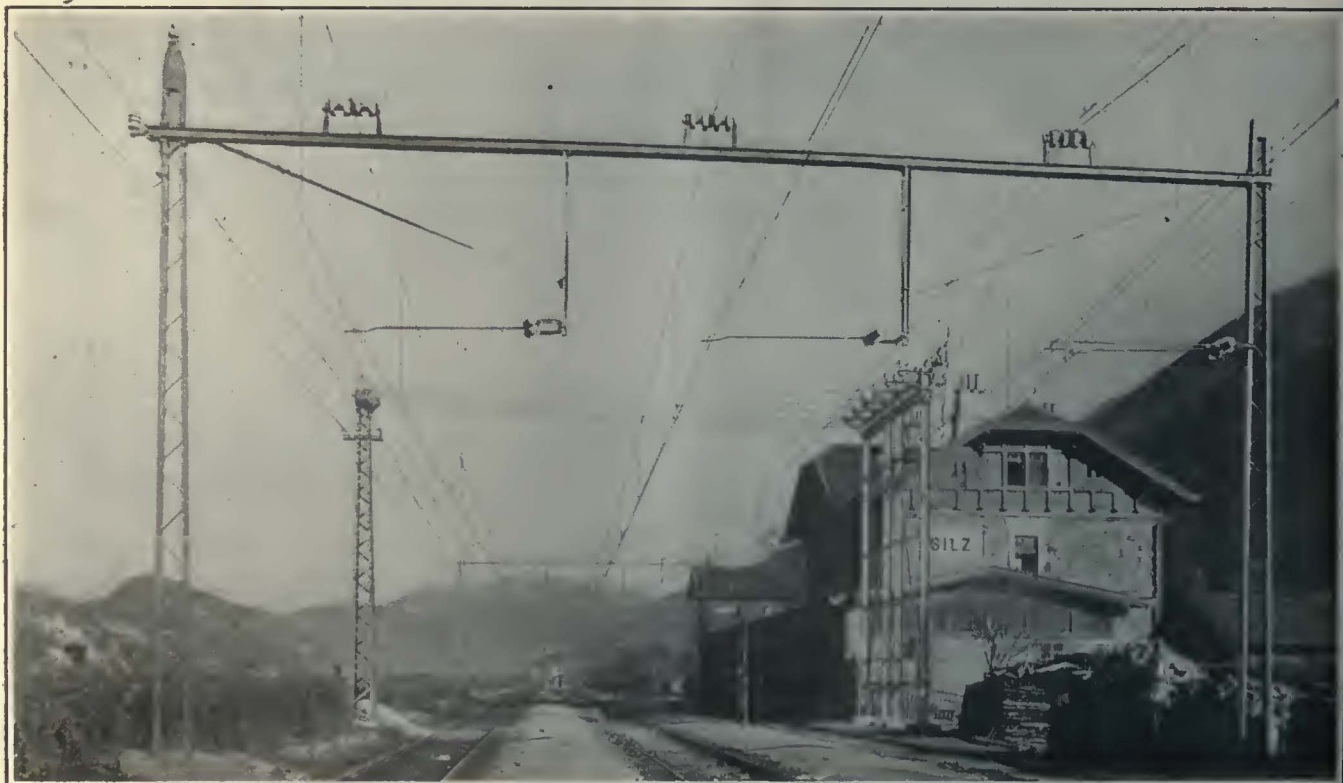
One is the type C locomotive for express trains. These locomotives are guaranteed to haul a train load of 320 tons up a grade of 3.15 per cent at a speed of from 15½ to 19 m.p.h. The electrical equipment of these locomotives was provided by the Austrian Brown-Boveri Works of Vienna.

The locomotives for local passenger trains were built by the A. E. G. Union Company, while the electrical equipment for the heavy freight locomotives was supplied by the Austrian Siemens-Schuckert Works.

SALZKAMMERGUT ELECTRIFICATION FINISHED

The second main road in Austria recently electrified is the Salzkammergut line of 67 miles total length. It also is a heavy-grade railway, with difficult track conditions, severe winter climate and many tunnels. Only one transformer substation is provided to supply the entire route, and this station receives its energy over two totally independent high-voltage lines. A double feeder line runs parallel to the road, except in one section where the catenary cable is of bronze and no feeder was required. The arrangement of sectionalizing the distribution system is very similar to that on the Arlberg road. The overhead construction, however, is much simpler, on account of less severe tunnel conditions.

Single insulation was found adequate throughout this line. The ground cable for protection against lightning is here attached directly to the tops of all steel towers. The line equipment was furnished by three Austrian



This Is a Typical Station on the Section in Which the Cnp and Spool Type of Insulator Is Used in the Catenary Construction

firms, the A. E. G., Siemens and Brown-Boveri. All three concerns made very extensive use of swinging outrigger arm construction, which is added to the catenary suspension method, the insulation being at the pole end of the arm, as shown in the left-hand illustration in the lower group on page 961.

This same view shows also the system of wire-tightening device by weights, as installed by the A.E.G. at distances of every six-tenths of a mile. In the tunnels with Siemens equipment a rather heavy double-sided wire suspension is employed.

The feeder through the $\frac{1}{2}$ -mile long Sonnstein tunnel and a number of shorter tunnels near by were made as an underground 16,000-volt cable. Without this cable it would have been necessary to carry the feeders over the Sonnstein mountain, which would have required a costly transmission line. This cable was tested with voltages up to 120,000 at 48 cycles without puncturing. Horn gap arresters are at present installed at the points where the overhead feeder enters the underground cable, but past experience has shown that future cables can dispense with this protection.

While only single insulation was provided on the Salzkammergut line, all suspension constructions are so designed as readily to permit the introduction of double insulation, should experience show that the present single insulation is inadequate.

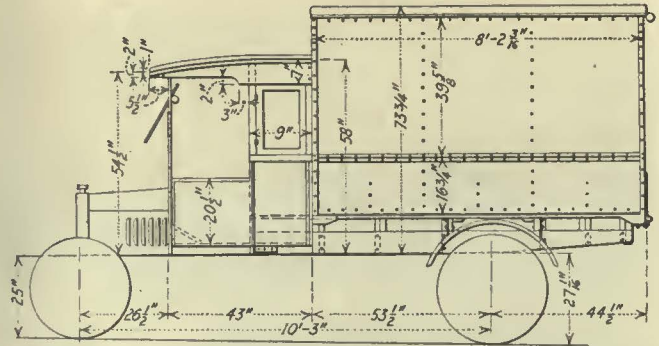
No rail bonds have been installed as yet, but so far no trouble has been experienced by their lack. Every 350 ft. the two rails are crossbonded.

Strong, Light Truck Built for Express Delivery

Illinois Traction System Uses 1-Ton Ford Chassis with Plymetl Sides and Haskelite Roof—Exterior Color Scheme Is Orange and Black

FOR the new collection and delivery express service recently inaugurated by the Illinois Traction System on its main division an unusual type of light truck is used. Bodies designed by J. M. Bosenbury, superintendent of motive power and equipment, are mounted on 1-ton Ford chassis. The framing of the bodies is of white oak, while the roof is of $\frac{1}{2}$ -in. three-ply Haskelite and the sides of $\frac{1}{8}$ -in. double-faced Plymetl. The roofs of the body and cab are covered with No. 8 cotton duck, held down by copper tacks. Reinforcement of the side is provided by a $\frac{1}{2}$ -in. x $1\frac{1}{2}$ -in. x $1\frac{1}{2}$ -in. tee iron.

The floor of the truck body is of $\frac{3}{4}$ -in. oak and has



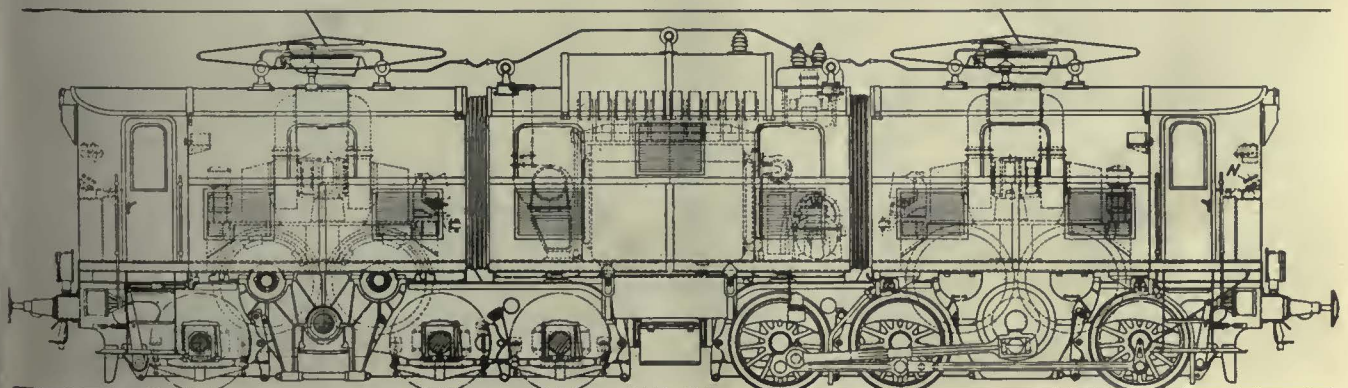
Side Elevation of Strong Light-Weight Express Truck Built by Illinois Traction System

been continued forward into the cab. The driver's seat rests upon this foundation. Thus the space at the right of the seat is available for long material which would otherwise overhang the rear end. This arrangement also permits the driver to unload many of the small packages without walking around to the back of the truck.

Careful attention has been paid to painting, which is in the company's standard color scheme of orange and black. One coat of primer, three coats of surfacer, two coats of tangerine color, two coats of rubbing varnish and one of outside finishing varnish are used.

Heavy Freight Locomotive for Silesian Mountain Railways

AS PART of the electrification program for the Bavarian section of the Silesian Mountain Railways an order recently was placed with the Allgemeine Electricitäts Gesellschaft for 34 heavy-duty freight locomotives. The frame of the locomotive consists of two three-axle trucks. The driving wheels on these three axles are coupled together with connecting rods and driven from a motor gear shaft located between the outside and second pairs of wheels. Four motors are arranged in two groups in series to form two double motors. These are fed from a transformer, so that the greatest difference of potential across the terminals of the double motor is 840 volts, while the maximum potential to earth does not exceed 420 volts. Control is effected by electrically operated compressed air contactors, which are fixed on the transformer so that a short and simple wiring system made up of flat copper bars is obtained. The transformer is placed at the center of the locomotive on a bridge, the two ends of which rest on the underframe. The bearing points also serve for coupling the two parts of the locomotive frame together.



New Silesian Locomotive Has Two Three-Axle Trucks, Each Driven by a Pair of Motors



Rosedale Car and Bus Loop, Toronto, Showing High-Grade Suburban Background

The locomotive housing is in three portions and the two outer ports are rigidly connected with the underframe. They inclose the double motors as well as the cooling equipment. There is a driving compartment at each end of the locomotive for the control and measuring equipment. The middle portion of the housing is supported by the transformer bridge and incloses the transformers and the contactors. The three portions of the housing are connected together by flexible gangways. Principal dimensions of this locomotive are as follows:

Gage	4 ft. 8½ in.
Driving wheel diameter	49½ in.
Length over buffers	55 ft.
Total wheelbase	38 ft. 9 in.
Fixed wheelbase	14 ft. 10 in.
Total weight	263,000 lb.
Weight per axle	44,000 lb.
Trolley voltage	15,000
Periodicity	16½
Maximum speed	34 m.p.h.
Gear ratio	1 to 4.04
Tractive effort for ten seconds	60,000 lb.

MOTOR RATINGS

One hour at 8.7 m.p.h. with tractive effort at wheels of 42,000 lb.	1,090 hp.
One hour at 18.5 m.p.h. with tractive effort at wheels of 43,000 lb.	2,300 hp.
Constant rating at 20½ m.p.h. with tractive effort at wheels of 33,500 lb.	1,960 hp.
Constant rating at 34 m.p.h. with tractive effort at wheels of 20,000 lb.	1,960 hp.

Trolley Loops Made into Parks

ONE feature of the rearrangement of mass transport system in Toronto under the direction of the Transportation Commission was the installation of new loops for turnbacks. Often the residents of a fine neighborhood do not relish the construction of a track loop in their midst, but in Toronto a different viewpoint has come about through the management's determination to make everything connected with the system a matter for civic pride. How this has been done in the case of the Lawton loop on Yonge Street and the Rosedale car and motor bus loop is shown in accompanying illustrations. The loops are in pleasing contrast to the weed-infested lot that often marks such track loops. They are veritable garden spots which a pleased public has delightedly christened "parkettes." A resident in the vicinity of the Rosedale loop fought the installation of a track loop for a long time. When he was finally convinced of the management's esthetic intentions he contributed generously himself a gift of 100 bushes. It was a happy coincidence that the erstwhile objector was a nurseryman. Track loops landscaped in this fashion not only enhance the good looks of the adjacent area, but also provide attractive boarding places for car and bus passengers.



Lawton Loop, Yonge Street, Toronto, with Bench for Patrons

A New Local Transportation Era Is Ahead

Tendencies in Regulation, Franchise Terms, Paving Requirements, Taxation and Rates of Fare Indicate Improved Fundamental Conditions—Rapid Progress Toward Co-ordination of Various Local Transportation Agencies Being Made

By L. R. Nash

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FROM time to time during the past ten years, particularly the latter half of that period, predictions have been made that the electric railway industry was rapidly approaching the end of its usefulness and would ultimately be replaced, in large measure at least, by railless transportation. Some of these predictions have been based upon the proposal to substitute bus service in New York City for certain existing railway lines. Other similar published views have been based on some abnormal, unfavorable local conditions, politics or prejudice, or have had no tangible basis.

In spite of contrary impressions, electric railway usefulness is not declining, but is steadily increasing. The traffic now handled is greater than at any other time in the history of the business. Every census of the industry has shown an increase in per capita electric railway riding over that of the preceding period. Between these five-year compilations there have been temporary recessions in traffic as well as in revenue, and this has also been true since the latest census. A year ago the traffic figures were not encouraging, but more recently there has been a noteworthy gain for the industry as a whole. This has not been shared by all companies, the best showings being made by the large city systems and the poorest by the smaller urban and interurban lines.

The phenomenal increase in motor vehicles has obviously diverted a large amount of traffic from rail service of all classes. The total motor vehicle registration in the United States is now close to 20,000,000. For several years automobile experts, as well as others, have predicted the approach of a saturation point in the use of passenger vehicles. However, with present registration equivalent to the number of families which could possibly afford or use an automobile, the manufacture of such vehicles still continues at an unprecedented rate. There are present indications that the "knee" in the curve of per capita registration has been reached and that future production will be limited, to an increasing extent, to replacements, export and the needs of expanding population. The increase in railway traffic in the larger cities is undoubtedly due in large

THE advantages of terminable permits in avoiding recurrent wrangling over franchise renewal conditions, in easier and more stable financing, lower costs of money, and otherwise, are well recognized, and this type of grant undoubtedly will have an important future effect on railway financing, operations and cost of service. All these recent franchise developments tend to remove the railways from the political field and to simplify the provisions necessary for the protection of either company or public.

part to the congestion of vehicular traffic, its increasing inability to move readily through or into business streets, and the lack of convenient parking facilities, all of which tend to discourage unnecessary use of private vehicles.

That the industry itself has not lost confidence in its future is shown by the fact that its 1926 budgets show greater provision for upkeep and extension of property than for several preceding years. Furthermore, in spite of abandonments of trackage in favor of bus service or otherwise, there was a substantial net increase in track mileage owned and operated in 1925, as was also the case in the preceding year. Although

the evidences of renewed vitality and progress above cited are encouraging, there are other factors which more fundamentally affect the future of local transportation.

REGULATION BRINGING TRANSPORTATION STABILITY

Electric railways are, and for some years have been, subject to regulation in more than three-fourths of our states. There has been no recent substantial change in the character of this regulation affecting rail service. There have, however, been radical increases in the adoption of regulatory methods in the broader field of transportation in which electric railways are now interested. This has included the conferring of rights upon electric railways in many states to carry on supplementary bus service and the regulation of such service whether conducted by railways or independent operators. All but ten states now have regulatory statutes covering the operation of buses. In 1925 ten new acts were passed and fifteen existing acts were amended to give more complete control over bus service. During the 1925 sessions of the state legislatures some 2,400 bills were introduced affecting bus service, 150 of them dealing directly with problems of regulation. Most of the states now lacking general supervision over bus service are located in the South, or in Western sections where low density of population has not invited this type of transportation. Generally speaking, the period of unrestrained and erratic competition between different kinds of trans-

portation, which has continued for more than ten years, has passed, and an orderly development of transportation on economic lines, with due recognition of the rights and duties of existing agencies, may be expected in the future.

The bus regulatory acts commonly include the requirements of a certificate of convenience and necessity, a substantial bond for protection against accidents, regular service over designated routes at stipulated rates, and other minor regulations consistent with those in effect for other classes of public service—all of which contemplate the elimination of uneconomical competition. Adequate supervision of interstate bus business is still lacking. Subsequent to decisions of the United States Supreme Court in 1925, which designated specific limits to state regulation of interstate carriers, the state commissions and others interested in the matter drafted a bill which was introduced in Congress by Senator Cummins, providing for joint regulation of interstate carriers by the commissions of the several states in or through which the service was rendered, with appeal to the Interstate Commerce Commission in case of failure of these commissions to agree. This bill, although indorsed by the National Association of Railroad and Utilities Commissioners and national organizations of motor vehicle operators, was opposed by certain local interests and failed of passage. It will undoubtedly have further attention, and it is of interest to note that a similar bill has been drafted for submission to Congress to regulate in a similar way interstate transactions in electric power, which business is becoming increasingly important. It is generally agreed that centralized federal regulation of utility business, some part of which crosses state boundaries, is not desirable, and that joint regulation by the several states whose boundaries are crossed is both logical and practicable. The crystallization of these views into the necessary federal legislation will be of material advantage to the industry.

RECENT FRANCHISES SHOW GREATER FLEXIBILITY

In recent years service-at-cost franchises have increased in number and have been improved in some substantial respects. The new railway franchise effective in Cincinnati last year eliminated certain of the undesirable features of its predecessor of the same form, including a removal of the old franchise tax and the cancellation of the city's claim to collect back taxes of this kind which were not earned. This franchise also eliminates paving charges, other than for repairs, and provides for an extension from time to time of the life of the grant under conditions somewhat similar to those in the well-known Cleveland franchise.

The Cleveland franchise has also just been amended in important respects, including an increase in the limits of the barometer fund consistent with the growth of the business, an increase in the range of permissible fares with a 10-cent maximum limit instead of 6 cents previously fixed, and a 1-cent higher fare in suburban areas than prevails in the city. These and other minor changes, together with an extension of the term to 1950, will permit more liberal expansion of the property and improvements in service.

The Grand Rapids service-at-cost franchise, operative since 1922, contains two desirable features: (1) A blanket right to occupy any streets on which service may be needed, without the formalities of supplementary grants, instead of the usual lengthy descrip-

tion of specific and exclusive locations, and (2) a provision that service may be operated by electric cars, trackless trolleys, or otherwise, thus recognizing the rights and obligations of the company to render local transportation service by whatever means are appropriate from time to time.

Increasing attention is being given to the subject of real estate assessments for partial payment of the cost of rapid transit or suburban railway lines. Such added service always brings about a large increase in real estate values which have been enjoyed wholly by the owners of such property. The proposal that a part of this increase in value shall be applied to the development of the transportation facilities which occasion it is receiving logical and increasing support from civic authorities. A detailed plan has been developed in Detroit in connection with rapid transit lines and similar plans are under consideration in New York, Chicago and elsewhere, the outcome of which may be more liberal extension of railway facilities without the prohibitive burdens upon their owners which have formerly existed.

There is still a lack under service-at-cost franchises of an incentive to sustained maximum efficiency of operation. This lack has been pointed out by many writers and in the decisions of regulatory commissions. It is obvious that a fixed wage without hope of advancement or other reward is not conducive to efficiency or progressiveness, and this principle is as applicable to the wages of money in public service as to those of an individual worker. The momentum in public utility alertness and efficiency developed in early years is still in evidence in spite of present regulatory limitations, but it is not logical that it should continue indefinitely.

The terminable form of franchise is receiving increasing attention. It is now effective in only a comparatively few states, and wider use requires supplementary legislation. Such legislation has been urged by the National Association of Railroad and Utilities Commissioners in connection with an indorsement of this form of grant and by many other organizations and prominent individuals. The Illinois Legislature now has a committee investigating this subject, with particular reference to its application to Chicago railway service. The advantages of terminable permits in avoiding recurrent wrangling over franchise renewal conditions, in easier and more stable financing, lower costs of money, and otherwise, are well recognized, and this type of grant undoubtedly will have an important future effect on railway financing, operations and cost of service. All these recent franchise developments tend to remove the railways from the political field and to simplify the provisions necessary for the protection of either company or public.

RAILWAYS GRADUALLY WINNING PAVING RELIEF

The prospect of continued and increasing relief from the paving charges with which electric railways have illogically been burdened since horse car days is encouraging. Reference has already been made to the omission of such charges from the recent Cincinnati franchise, and other modern drafts show similar omissions. Recent specific cases to the number of more than 60 have come to the writer's attention in which permanent or temporary relief from paving charges has been granted by legislative acts, commission orders or franchise or other city ordinances. Nearly one-half these cases involved franchise modifications. A New Jersey

Senator recently stated, in behalf of a blanket paving relief act, that eight other states had already granted such relief.

The sentiment of regulatory authorities, as well as other students of the economics of the situation, are wholly in favor of the elimination of charges in connection with paving aside from maintenance and other minor costs incident to railway service. This is abundantly shown by an increasing volume of commission decisions and other published statements. An interesting case is that of the New York & Queens County Railway in 1924, in which the commission authorized a specific increase in fare in connection with each paving job forced upon the company, such increase to remain in effect until the cost of the paving had been amortized. Other commissions have authorized removal of tracks to avoid paving assessments, and otherwise expressed disapproval of the practice that imposes upon car riders a burden which not only is entirely foreign to the service they receive but subjects them to added delays in this service. In a recent book the writer referred to paving charges as the "outstanding anachronism of the industry," and such characterization seems wholly justified by the authoritative statements and actions referred to above.

The ultimate satisfactory solution of the paving problem lies in the education of the public regarding the issues involved. When car-riding citizens who pass upon franchise provisions, either directly by referendum or through the selection of their administrative officials, clearly understand the injustice involved in their paying for paving which their more prosperous neighbors use for pleasure or business, they will relieve themselves of such payments. The practice adopted by many railway companies of publicly pointing out the effect of paving charges on fares, through newspapers, billboards erected on paving jobs, and otherwise, should be commended as an effective step in this program of education. If the millions of dollars now annually spent on paving work were wholly applied in the future to improved equipment and service at lower fares the public would not be the sole beneficiary, for the railways would share in the gain through increased traffic.

TAXATION RELIEF MUST COME

The railway industry has from time to time protested against the heavy burden of taxes and other imposts heretofore carried. The industry does not object to taxes consistent with those assessed upon other property and business, but contends that taxes and imposts amounting to 10 per cent of annual revenues, and in many cases an amount in dollars greater than is distributed to the owners of the properties, are inconsistent with the charges paid by other indus-

tries for the support of government. Increasing attention is being paid by tax authorities to a revision of the old system of public utility taxation, including a substitution for all other taxes of a proportion of gross earnings varying between certain limits with net earnings, and early relief is to be expected.

The industry has also pointed out the injustice of federal taxes on its income and that of its employees, whereas corresponding income derived from municipal undertakings of similar character is exempt. The current federal income tax law removes this exemption from municipal employees, but the rest of the program awaits further consideration. Such actions, although only indirectly helpful, indicate a favorable attitude on the part of national authorities in spite of their lack of intimate contact with utility affairs.

IT IS not unreasonable to look forward to the time when at least the majority of the 60,000 buses now operating in common-carrier urban and interurban service, and for terminal, school and other special traffic, together with a substantial part of the urban taxi business, may be brought into co-ordination with railway systems, with a large gain in load factor and efficiency of operation and a corresponding saving in ultimate total investment. This is believed to be the outstanding present opportunity for transportation development.

The field of co-ordination of various forms of transportation, urban and otherwise, is a most promising one for cultivation by electric railway officials. Only a few years ago the industry looked on the motor bus as a competitive nuisance, but there has since been a revolutionary change in viewpoint. In 1920 only sixteen railways operated bus service as an auxiliary to rail lines. Today nearly 300 companies, or more than one-third of the total number in the United States, are operating buses to the number of about 6,000 over 15,000 miles of route, carrying about 800,000,000 passengers per annum, and involving an investment of upward of \$40,000,000. These operations probably include more than 25 per

cent of all common-carrier bus service, and the proportion is rapidly increasing through added railway buses, purchase of competing equipment, or abandonment of unprofitable independent service. The ratio of bus service, traffic and investment to total corresponding figures of the industry is small, but there is increasing appreciation of the advantages of buses for scattered traffic, for suburban development service and to avoid expensive track reconstruction even where traffic is comparatively heavy.

The data so far accumulated on the revenues and costs of bus service are still too meager to justify definite conclusions as to the extent to which it may economically replace rail service. It is possible that in a considerable number of cases enthusiasm over the attractiveness of bus service has led to an unwarranted frequency or extent of such service, and that adequate net income has not had sufficient attention. Time and accumulated data will permit the correction of earlier mistakes. The substitution for the time being of railway buses for previous competitive buses without adjustment in their numbers or in the associated rail service also accounts for some instances of unprofitable operation.

Some years ago the writer expressed the opinion that

there was a possibility of further co-ordination between railway and motor-vehicle business in connection with the service now operated by taxicabs. Although these vehicles render exclusive service, there are abundant opportunities for co-ordinating it with rail transportation, including what may be called "pick-up-and-delivery" service, giving passengers convenient transfer between home and railway lines or railway lines and destination, particularly in inclement weather, using railway lines for long intermediate and expensive haul. A through fare system and prearranged taxi connections would add to the convenience of such service. The experiments in this direction which have recently been projected in Philadelphia should be watched with particular care.

Traffic congestion on the streets of our large cities is caused to a material extent by the idle cruising of taxicabs in search of fares. If this cruising could be eliminated by the establishment of a central transportation agency connected with a suitable number of accessible points from which taxis could be summoned speedily, and cruising were correspondingly restricted, the problem of traffic congestion would be much simplified in the interests of both railway service and other necessary users of the streets. It is not unreasonable to look forward to the time when at least the majority of the 60,000 buses now operating in common-carrier urban and interurban service, and for terminal, school and other special traffic, together with a substantial part of the urban taxi business, may be brought into co-ordination with railway systems, with a large gain in load factor and efficiency of operation and a corresponding saving in ultimate total investment. This is believed to be the outstanding present opportunity for transportation development.

FARE TREND ENCOURAGING

The trend of electric railway fares has been distinctly encouraging. The present level is approximately 50 per cent higher than that of 1914, and is as high as at any time since the movement away from the older universal 5-cent fare began. The number of cities in which a 10-cent cash fare is in effect has steadily increased, now totaling more than 80 out of the 288 cities having a population of 25,000 or more—a greater number than is found with any other rate of cash fare. The number of lower cash fares, particularly 6 cents and 8 cents, has correspondingly decreased, and the number of these cities which still retain a 5-cent fare for universal transportation is practically negligible. With the 10-cent cash fare, lower rate tickets are sold where costs warrant, thus combining the desirable simplicity of a single coin fare with concessions to regular riders.

A word of caution may not be inappropriate at this time in relation to bus fares. Many companies inaugurating bus service have made charges therefor identical with rail service, with transfer privileges. Doubtless in many cases this practice is necessary because of the abandonment of earlier rail service over the same routes or the use of buses as substitutes for extensions of rail lines. It is, nevertheless, true that scattered and irregular traffic, which buses largely serve, is unprofitable with either cars or buses, and that rail service is more economical for mass transportation. The intermediate field for profitable operation of buses at rail rates of fare is limited.

Bus service is undoubtedly popular with the travel-

ing public, and if parallel bus and rail service were available, many people would prefer to pay more for the bus service than for the less attractive car ride. This fact is demonstrated by the experience of various companies. If the public prefers bus service and is willing to pay more for it, the companies, particularly in the formative years, should not saddle themselves with unprofitably low rates which cannot later be increased without excessive complications. The experience of railways with the 5-cent fare and the rapid obsolescence of the early types of electric railway equipment should be a warning to the industry not to establish unwise precedents in bus fares under present experimental conditions. The unprofitable character of the bus business in California, where it is most systematically and extensively developed, and the recent spectacular failure of a pretentious interurban bus project in Indiana should be a warning against ill-considered action with respect to rates of fare.

GREAT EFFORT TOWARD CIVIC CO-OPERATION

Reference should also be made to the active participation of various railway properties in the study and solution of the intricate problems of city traffic regulation. The results so far secured through car and vehicle rerouting indicate further relief, with increased car speeds in business districts and consequent decreased cost of the passenger haul. In other ways, also, railways are taking a more active part in community life and are making special efforts to improve their equipment and increase the attractiveness of their service. This has involved capital expenditures, but substantial operating economies have resulted. It is interesting to note that more than 60 per cent of the new passenger cars purchased in 1925 were equipped for one-man operation, indicating the general satisfaction with one-man service and its payroll economies. The credit standing of properties engaged exclusively in railway business has not as yet shown general improvement, and such improvement cannot be expected in some cases. The industry as a whole, however, may confidently look for a gradual improvement and a return of investment confidence.

RAILWAYS ARE NOT SUPERANNUATED

The foregoing discussion has at least suggested that the electric railway industry is not superannuated and obsolete and that the wiping out of its \$6,000,000,000 investment is not imminent, as has been claimed recently by a prominent steam railroad official. On the contrary, it appears that the industry is just entering upon a new era of broadened activity and usefulness in which it will have opportunity to demonstrate the soundness of its recently emphasized views that the common-carrier service of the cities is its job, to be carried on with due regard not only to economy in investment and operation but also such liberality and refinement in facilities and service as the public is able and willing to support. Railway executives are every day folks. They have had more than their share of discouragements in past years, but the skill and persistence with which they have attacked and overcome their difficulties gives assurance that they can successfully function in the broader field now open to them. They need one other quality in their new job—vision. The writer believes they have it and can and will develop it further as occasion arises.

Union Station Built at Sacramento

ELECTRIC RAILWAYS entering Sacramento, the capital city of California, have joined hands in the construction of a new union passenger station. This is located at Eleventh and I Streets, in the heart of the hotel and business district. Companies using the station are the Sacramento Northern Railroad, the San Francisco-Sacramento Railroad and the Central California Traction Company. The station is reached by the local street cars of the Sacramento-Northern Railroad, which issue to and honor free transfers from the Pacific Gas & Electric Railway street car system.

Architecturally the station is a departure from established precedent in California. It is an adaptation of the Corinthian style, with the front divided into five sections by full length columns, as shown in the accompanying illustration. Materials used are brick and cast stone, finished with colored cement. The foundations are of concrete. The primary supporting frame members are of steel, while the joists and studding are of Oregon pine. Floors are of pine in the offices and of dark red cement in the waiting room, toilets, etc.

The arrangement is simple and direct, affording convenient access to the trains through the main waiting room. The depot fronts on a new thoroughfare connecting two adjacent streets. At the rear a covered concourse extends the full length of the depot parallel to the tracks. A waiting room 50 ft. x 80 ft. occupies the center of the main floor facing the street on one side and overlooking the concourse on the other side. Walls are of rough tooled plaster decorated in warm tones. Trim is of vertical grain Oregon pine stained gray, while the ticket counter and screen, telephone booths, concession counter, settees, etc., are of quartered oak. The settees are designed with high backs, wide seats and arranged parallel to the direction of circulation.

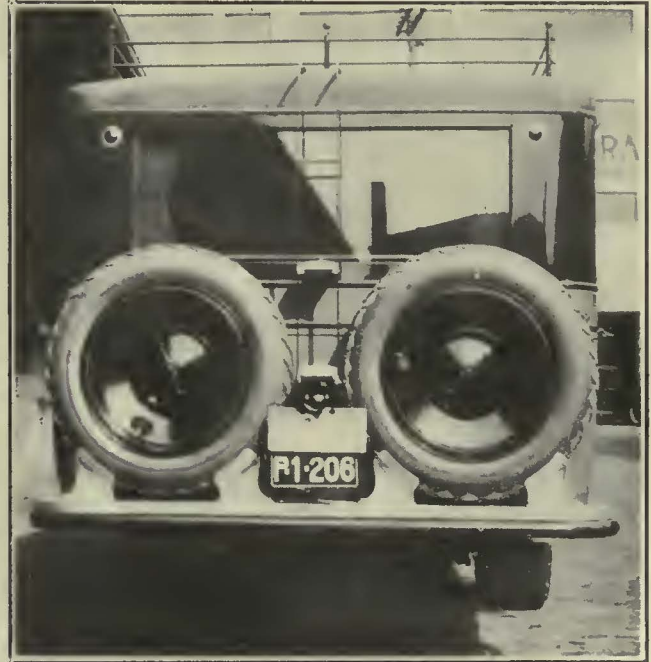
At one corner of the waiting room is the news-stand. This has a soft drink counter accessible by a sales window to the concourse area fronting the tracks. A privately owned lunchroom is directly connected to the depot by the door adjacent to the news-stand.

On a mezzanine floor are trainmen's rooms at one end and office accommodations for the San Francisco-Sacramento Railroad at the other end. The entire second floor is occupied by the general offices of the Sacramento

Northern Railroad. On the ground floor a baggage room is located on one end of the building where it is convenient for receiving baggage from the front on Terminal Street, hand baggage from the waiting room and delivering baggage by truck through a door opening on the concourse to the trains.

Bus Practices Changed at New Bedford

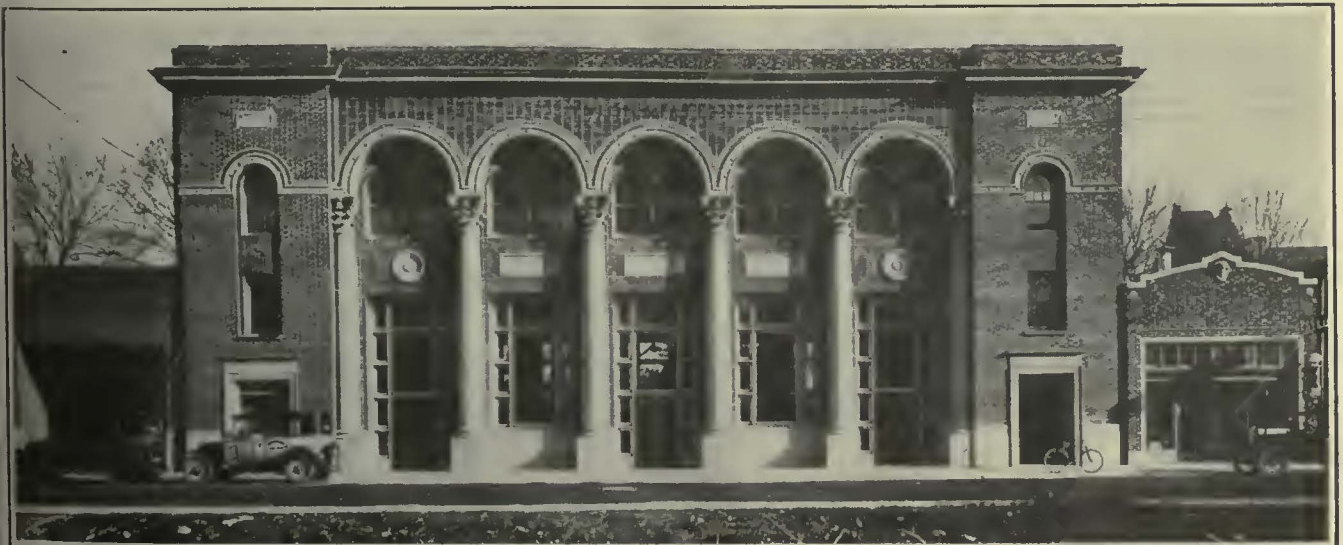
LONGER experience with bus operation has caused the Union Street Railway, New Bedford, Mass., to make certain changes in its standard practices. The color scheme of the buses used by this company has been



Union Street Railway, New Bedford, Mass., Has Found the Rear Bumper to Be the Most Convenient Place to Carry Spare Tires

altered from Pullman green, as used on its cars, to an attractive combination of light and dark brown shades. It has been found that the new color scheme gives a much better appearance to the bus after it has been operating for a considerable period on dusty or muddy roads.

A change has also been made in the method of carry-



Simple and Dignified Union Passenger Station Built by Electric Railways at Sacramento, Cal.

ing spare tires. Buses that have been operated in the past have carried spare tires either in compartments underneath the body or in racks along the sides of the engine hood. These two methods proved unsatisfactory because the compartments were large enough to accommodate only one tire each and were so located that it was practically impossible for the driver to place a tire in them unassisted. When tires were placed on either side of the engine hood it was necessary to cut away parts of the front mudguards to provide sufficient space to hold the tires. Before any engine repair work could be done the mechanics were obliged to move these tires. To overcome these difficulties it was decided to have spare tire racks located on the rear of the bus. An accompanying illustration shows how this has been arranged on one of two Yellow Coaches recently purchased. The tires are supported on aluminum castings resting on the rear bumper. The ladder has been moved from its usual location at the side of the rear to a position midway between the two spare tires.

Pueblo Cars Remodeled for One-Man Operation

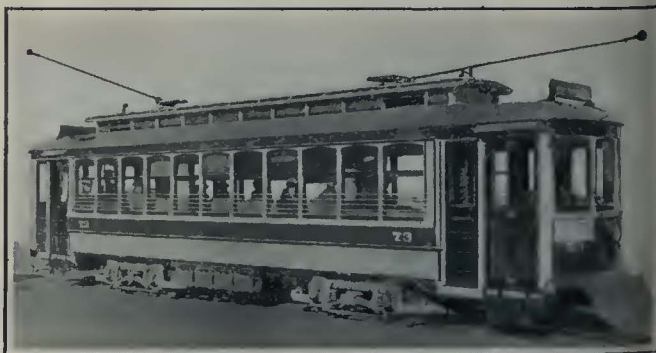
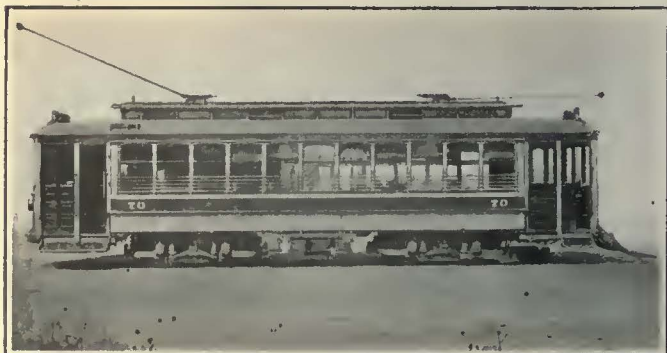
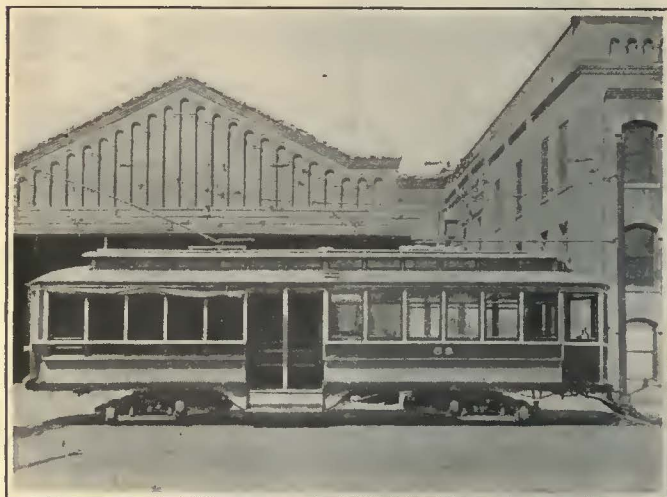
Rear-Entrance-and-Exit Cars Have Been Redesigned by the Southern Colorado Power Company for Front-Entrance and Rear-Automatic-Exit Operation

FOLLOWING a change in the city ordinances of Pueblo permitting the operation of one-man cars on all lines, the Southern Colorado Power Company has remodeled much of its electric railway rolling stock. Prior to the early part of the present year the city

ordinances had limited the company to the operation of Birney cars on some light traffic lines in the outskirts. Two-man cars were the only type used on the heavy traffic lines.

A serious decrease in riding has occurred during recent years due to the prosperity of the steel business, the principal industry of the city, and the consequent widespread use of private automobiles. In 1920 the railways carried 9,201,474 passengers, while in 1925 the number carried was only 6,947,499, a loss of 24 per cent in five years. Until November, 1919, the fare had been 5 cents. At that time it was increased to 6 cents for a period of three years, and at the expiration of that time it was renewed for a like period. Under the terms of the ordinance it was provided that the fare revert to 5 cents at the end of 1925. On Jan. 27, 1926, however, permission was obtained to increase the fare from 6 cents to 7 cents, with fifteen tokens for \$1. At the same time permission was obtained to operate the one-man cars. These two measures have been instrumental in affording relief to the company.

It was decided to remodel the two-man cars on the Lake and Bessemer lines for one-man operation. The Bessemer line, carrying the steel workers, was the heavier traveled line, so it was decided to begin with the Lake line. Cars on this route had been purchased in 1912 and were in good condition with modern motors. They were operated pay-as-you-enter with rear entrance and exit. Remodeling consisted in arranging them for one-man operation, pay-as-you-enter at the front door, with exit through a rear or side door equipped with an automatic treadle. Accompanying illustrations show two types of cars operated by the Southern Colorado Power Company before and after remodeling.



The Two Upper Views Show the Center-Door Car of the Southern Colorado Power Company Before and After Being Remodeled for One-Man Operation. The Rear-Entrance-and-Exit Car (Two Lower Views) Has Been Redesigned for Front Entrance and Rear Exit with Automatic Treadle Door Arrangement

P.R.T. Improves Selection and Training Methods for Employees

Psychological Tests Interposed Into the Process of Selection in Order to Eliminate Candidates Who Are Inherently Unqualified for Platform or Bus Service—All Platform Men Are Trained for Both Motorman and Conductor Duties, so that They Are Interchangeable for Two-Man Operation and Qualified for Duties of the One-Man Car Operators

CHANGING conditions of our civic life have reflected themselves in the greater care exercised by many of the larger companies in the selection and training of car and bus operators. The Philadelphia Rapid Transit Company has been reviewing its methods for a number of months and has announced important changes and additions to its program that are calculated to improve upon the caliber of men through scientific selection and the better training of the successful applicants. Even after men have been trained and are regular operators an elaborate follow-up system will continue to guide them and record their progress.

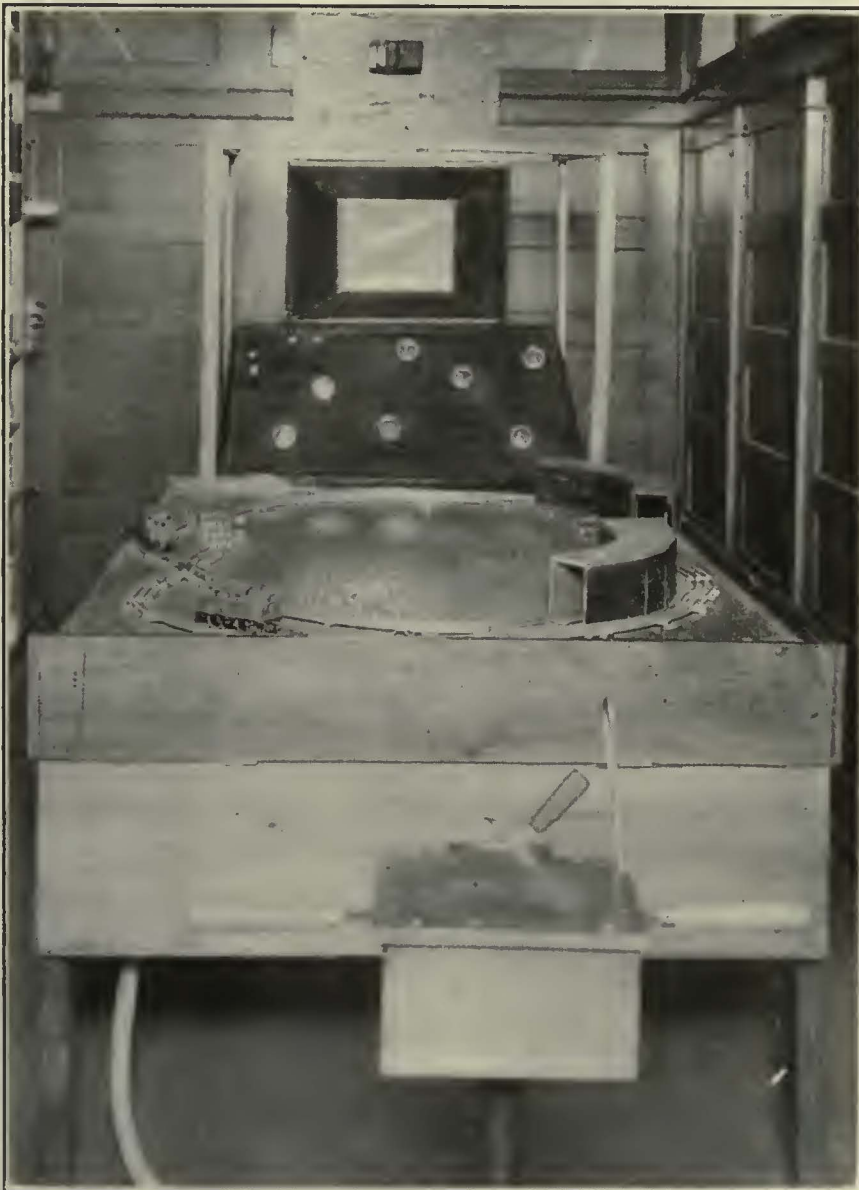
In a consideration of the Philadelphia methods it is well to realize two fundamental things that differentiate this company's policies from those of many others. First, the company has long since adopted a policy of not re-employing men who have voluntarily left the service. A more recent policy is that all platform men employed must be selected and trained for one-man operation. An applicant breaks in as a motorman and after a month or so receives the additional training necessary in the duties required of conductors. In this way a new man is qualified for operation of either end of a two-man car or a one-man car.

Bus operators are selected in a similar manner to trainmen.

PROGRAM OF SELECTION

During an initial interview requiring from five to fifteen minutes by the assistant employment manager the applicant is questioned closely about his past experience, his social and marital condition and a number of references are obtained. This information is noted by the examiner on cards, a different color being used for the different classes of employees, such as train service, bus service, bus mechanical, way and structures, office employees. Whether the applicant is later employed or not, this card remains as a record of his request for work.

If the applicant passes this preliminary examination he proceeds to the medical department, in the same



New Psychological Testing Equipment Used in Philadelphia

This view shows the laboratory equipment for the second and third phases of the psychological test used by the Philadelphia Rapid Transit Company. The first phase of this test is the paper test and is given in groups. The last two phases are

individual tests which require about a half hour. The applicant stands in front of the small upright table with the several handles in front of him. There are also two pedals, one arranged to be operated by the left foot and the other by the right.

building, where he is given a quite thorough physical examination, covering eyes for vision and color blindness, ears, major physical defects, hernia and foot trouble.

The applicant then writes his own application and states in his own words the general information re-

quired and gives the references with which he wishes the company to communicate.

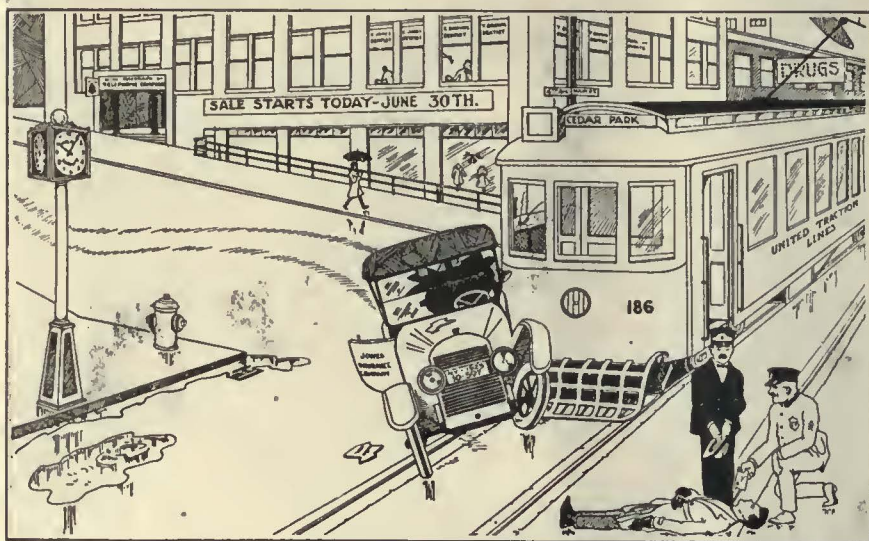
Applicants for positions in the train service are being tested at the present time, although no rejections are being made on this basis until standards for rejection have been determined. Such standards are being developed by comparing performance on tests with observed results from work on the cars.

The psychological examination as performed in Philadelphia is in three phases: First, a paper test is given. This test may be administered to a group of applicants equally as well as to one or two. It is a test of the so-called mental alertness type, consisting of a set of thirteen pages and 44 questions. Before the blanks are distributed the applicants are told that they are going to be given this written test and that they will be given a certain limited time to complete it. The object of the examination is to see how much can be accom-

are so laid at the rear of the table that there are two points, one on the right-hand side and one on the left-hand side, in which the curves represent non-clearance curves. The toy locomotive on one track is started by the examiner and passes around the track at a predetermined speed. The train on the second track is called the subject's train and is controlled in speed by the applicant, through moving the switch which can be seen in the illustration, located between the two side handles, either to the left or to the right. A small counter is arranged so that the number of revolutions of both trains are counted automatically. The trains revolve about the tracks in the same general direction; that is, counter-clockwise. Tunnels are provided for both the record and the subject's train, so that the movement through these blind areas must be estimated by the student.

The object of this test is to move the subject's train around its track as rapidly as possible and at the same time to avoid collision at either of the two intersections or the two non-clearance points at the rear of the table. This apparatus is shown to the student and he is told how he may control the speed of the train and is then instructed to proceed. He is given two minutes of this test. Then a second period of two minutes is given under slightly changed procedure. This test was designed to gage the ability of the applicant to judge speed and distance as well as his "recklessness" in operation.

The third phase of the psychological test is then entered. This is a development of the test originally designed for the Milwaukee Electric Railway & Light Company by Dr. Viteles, a description of which process appears on page 624 of the April 10 issue of ELECTRIC RAILWAY JOURNAL. This part of the test, known in Philadelphia



A Memory Picture in the Paper Test

The applicant studies this picture for two minutes and then is asked several questions in the spiral test that follows. This is part of the first phase of the psychological examination for P.R.T. trainmen and bus applicants.

plished accurately. In other words, if one question puzzles them, they are instructed to drop it and go to the next. The 44 questions cover a series of subjects. On the third page of the test a picture, here reproduced, is shown, and instructions are to look at this for two minutes and paste the top sheet over it with a gum strip provided on the page. Following the picture a problem is given in simple addition. The second question gives instructions pertaining to the association of five names and numbers. Further on other simple arithmetical problems are given, and question seven is the first referring to the content of the picture on page 3. In this way, through the 44 questions, the same subjects are repeated in what psychologists call the spiral order of questioning. Several of these questions and answers are reproduced in these pages to illustrate the plan of this test.

The student now passes to the second phase of the psychological test, which introduces a new element into this class of work. By referring to the illustrations showing the psychological laboratory equipment it will be seen that there are two toy electric tracks. Each of these tracks is in the form of an irregular circle, one interposed on the other, so that there are two intersections, one on either side of the table lying immediately in front of the subject being examined. Also, the tracks

as the "signal phase," is operated by the motor-driven mechanism shown in one of the views. The seven lights ahead of the applicant being tested are made to flash on and off in a regular sequence, but at regular intervals a bell is made to ring or a horn is made to sound coincident with one of the flashes. When either the bell or the horn is sounded this signal requires a certain response from the applicant, who stands in front of the upright mechanism seen in the foreground of the picture. Some definite move of the two handles or the two pedals is required for each signal. The applicant is trained in a regular manner and his actions are recorded on the tape for a period of sixteen minutes. During this time the examiner notes the readiness with which the applicant learns to respond to signals. After a moment's rest when the sixteen-minute training period is over the actual test is given, which lasts for six minutes. A record tape is made and the applicant's responses are checked on this tape after the test has been completed. Whenever the applicant makes a response to the bell or horn or disappearing light signal, he sees a small light in the upper left-hand corner of the panel facing him, which shows that he has made the correct response. The instant of this response is also recorded on the tape.

The distraction light, which was used in the Mil-

waukee laboratory, consisting of a 150-watt lamp that flashed on at definite intervals during the test period, has been supplanted in the Philadelphia test by an arc light, which has been arranged to flash violently on and off so that the distraction is partly visual and partly auditory. When this signal occurs the operator must perform a certain combination of movements to make the proper response. This distraction light can be seen through the window at the top of the apparatus facing the subject being tested.

A further variation in this equipment is the flashing on of typical street scenes by means of a small projecting lantern at the back of the equipment. Pictures become illuminated at certain definite periods of the test on the small screen seen directly in front of the applicant being tested. This portion of the test was developed for the psychological test now given to taxicab drivers in Philadelphia under Dr. Viteles' direction. This is of particular value for use in selecting applicants for bus drivers as well as taxicab operators. This use of street scenes is quite new and standard procedure for its use has not been developed.

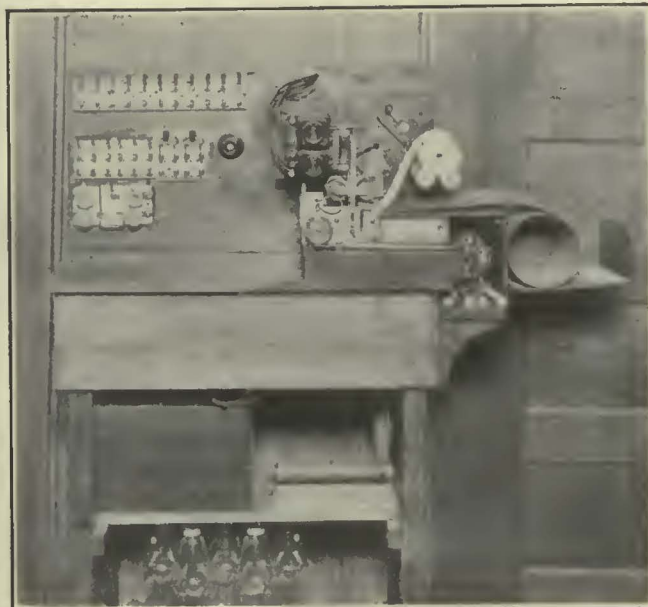
AFTER SELECTION COMES THE TRAINING PERIOD

The psychological tests are estimated to require about one hour. The paper test requires half the time and can be given in groups. The other half hour is an individual test in the laboratory.

Assuming that he has passed all of these tests, the applicant is then sent to the training school.

The development of tests ties in very closely with the whole training program, which is in reality an advanced phase of selection, since no man is finally qualified until he has completed training and demonstrated his ability to operate. The entire training procedure is at the present time being subjected to a thoroughgoing analysis and will be fundamentally reorganized. Several important changes in method are still under consideration. Conclusive results from these cannot be anticipated for some time to come.

Following up the student is considered of great importance. On form PT-130, made up on a letter size sheet, the complete employment department's record of each applicant, his training and his follow-up record are entered. The preliminary rating is determined from the first four days that the man spent in the instruction



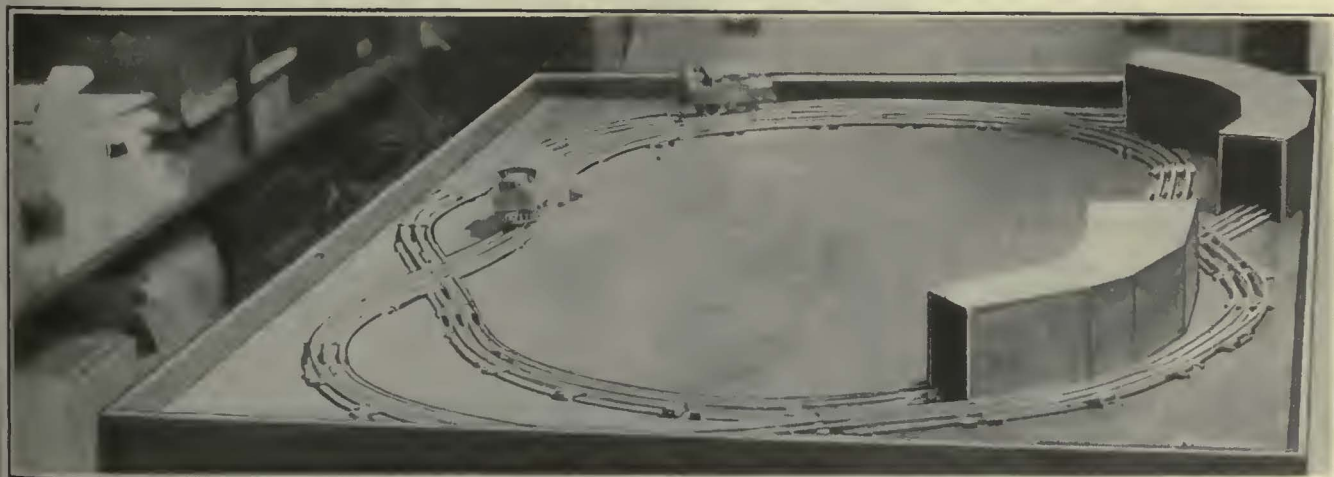
The Operating and Recording Mechanism for the Flashing Lights Which Give Visible or Audible Signals and Record the Responses that the Applicant Makes

school. The line rating is determined from the ten days that he spent on the cars with the motorman trainer. His final rating is determined from his examination in the school after the fourteen or fifteen days' initial training period. The total rating is based on all of these elements, plus observations of safety and power saving. A place for a record of supplementary training is given on this card and provision is also made for the follow-up record, reports on which are obtained each week on operating, safety and power saving.

On the reverse side of this form is the transportation department's record, showing the operating hours as conductor or motorman. A notation as to power saving and accidents is made and places to record other points, such as absences, misses, violations, reports of courtesy and discourtesy, are provided.

SCIENTIFIC BACKGROUND OF PSYCHOLOGICAL WORK

It is estimated that several months more will be required before sufficient data are obtained from the new applicants that are being employed every day in order to



A Close-Up of the Train Test Used by the Philadelphia Rapid Transit Company in Selecting Employees

On the table in front of him is the train by the small handle seen on the operator's upright stand. There are two crossings and two non-clearance curves at the rear of the table where collisions may occur. The test is to operate the subject's train around the track the greatest number of times in a two-minute period, with the least number of accidents.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
NAME											BORN		FILE
ADDRESS								PHONE		PREVIOUS APPLICATION		YES	NO
COLORED			MARRIED		WIDOWED		SINGLE		NO. OF CHILDREN UNDER 18		OTHER DEPENDENTS		
BIRTHPLACE				PARENTS				CITIZEN		FIRST PAPER		DATE	
RAILWAY EXPERIENCE													
EDUCATION				GRADE	YEAR	NAME OF INSTITUTION		LOCATION		SUBJECTS OR SPECIALIZATION		ADULTHOOD	
EDWARD SCHOOL													
HIGH OR PREP. SCHOOL													
BUSINESS TRADE SCHOOL OR COLLEGE													
NIGHT OR CORRESPONDENCE SCHOOL													
TRADE OR OCCUPATION				FOLLOWED FOR HOW LONG									
REMARKS				APPEARANCE				ENVIRONMENT					
				MANNER				EXPERIENCE					
				LANGUAGE				TEST					
				OTHER REASON:									
				MEDICAL				ACCEPTED				REJECTED	
LETTER		FROM		TO REPORT		INVESTIGATE		BY		INTERVIEWED BY			

NAME		ADDRESS	
POSITION WANTED		AGE LAST BIRTHDAY	
EMPLOYER		BUSINESS	
ADDRESS		OCCUPATION	
YES	NO	LEFT	RATE

Face and Back of Form Filled Out in the Original Interview for Applicants for Platform Service. Similar Cards of Different Colors Are Used for Other Classes of P.R.T. Applicants

form a proper basis for establishing final standards for selection of applicants, involving the rejection of those found unqualified.

Morris S. Viteles is the consulting psychologist for the Philadelphia Rapid Transit. Dr. Viteles, who is also assistant professor in the department of psychology at the University of Pennsylvania, has had a wide experience in this branch of personnel work, having designed the early equipment used by the Milwaukee Electric Railway & Light Company which was described in the article referred to previously.

Common to all scientific applications of a genuine nature, a considerable air of modesty surrounds the work and results claimed. The paper test is designed to bring out the simple, although fundamental, qualities of mental activity and persistence that are necessary to the job.

Sample Questions from Paper Test of Mental Alertness

Several questions picked at random from the complete list of 44 questions which comprise the first phase of the psychological test recently started by the Philadelphia

Rapid Transit Company's employment service. This portion of the test is known as the paper test. Each applicant is given a complete copy of the 44 questions and told

that he will be given a limited time in which to answer the questions and that he will be rated on the number he has answered and also the accuracy.

7. Answer the following question about the picture of the automobile accident which you observed:

What was the name of the street the car tracks were on?

Answer:

8. Look at these names and numbers:

- | | | |
|---------|----------|---------|
| 1 | 2 | 3 |
| Oakland | Valley | Downing |
| 4 | 5 | |
| Retreat | Longland | |

Write alongside of each name below the number which belongs to that name.

- | | | |
|----------------|----------------|----------------|
| Retreat | Valley | Downing |
| Oakland | Retreat | Longland |
| Downing | Longland | Retreat |
| Longland | Oakland | Valley |

9. Put a Cross Before the Best Answer to this Question:

If you fell asleep on a train and rode 10 miles beyond your station, what would you do?

- Pull the bell rope and stop the train instantly.
- Tell the conductor to take you back.
- — Get off at the next stop and take another train back to your station.
- Jump off and walk back.

The best answer to this question is "Get off at the next stop and take another train back to your station," so you must place a cross (X) before this answer. Make no mark on the other blank lines.

This is a sample problem to show you how the others like it are to be done.

13. Tokens cost two for 15 cents and exchanges 3 cents apiece. A passenger hands you a dollar bill and asks for four tokens. What is the smallest number of coins you could give back in change?

- | | | |
|-----------|-----------|------------|
| — Dollars | — Halves | — Quarters |
| — Dimes | — Nickels | — Pennies |

14. Put a line under the letter "A" below:

A B C D E F G H I J K L M N

You must draw a line under the letter "A" because this is what the directions tell you to do.

15. Draw a circle around the largest number and a line through the smallest number below:

57 19 41 3 101 11 17 99 32

16. Write alongside of each name below the number which belongs to that name:

- | | |
|----------------|---------------|
| Valley | Downing |
| Longland | Oakland |
| Retreat | Valley |
| Oakland | Retreat |

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

17. Answer the following question about the picture of the automobile accident which you observed:

What is the number of the motorman?
Answer:

29. Write alongside of each name below the number which belongs to that name:

- | | |
|----------------|---------------|
| Longland | Retreat |
| Valley | Downing |
| Oakland | Valley |
| Longland | Oakland |

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

30. If three pencils cost 5 cents, how many pencils can be bought for 50 cents?

Answer:

31. Answer the following question about the picture of the accident which you observed?

To whom does the automobile belong?

Answer:

32. Write alongside of each name below the number which belongs to that name:

- | | |
|----------------|---------------|
| Oakland | Retreat |
| Valley | Downing |
| Oakland | Valley |
| Longland | Oakland |

Turn back and look at question 8 if you cannot remember the numbers. Do not guess.

33. Put a cross before the best answer to this question:

If you see two automobiles collide on the tracks about a half a square ahead of the car you are operating, what would you do first?

- Bring the street car up to the accident so that you can observe it more closely.
- Pass cards around among the passengers in order to obtain their names as witnesses.
- Bring your car to a stop immediately at a distance from the accident.
- Drive your car up so that you can use it in clearing the track by pushing the wrecked automobile off.

34. Above the first letter below make a cross. Draw a circle around the letter which follows it in the alphabet and a line from this to the last letter below:

J A R N P K L O S T V A

42. Answer the following question about the picture of the automobile accident which you observed:

From what state is the automobile?

Answer:

43. Tokens cost three for 25 cents and exchanges 3 cents apiece. A passenger hands you a \$2 bill and asks for nine tokens and nine exchanges. Note the change in the price of tokens.

What is the smallest number of coins you could use in making change in this transaction?

- | | | |
|-----------|-----------|------------|
| — Dollars | — Halves | — Quarters |
| — Dimes | — Nickels | — Pennies |

44. If the letters in the word "so" appear in the same order that they do in the alphabet and if the same is true of the letters in the word "by," write the letter Z. But if this is true of only one of these words, write the last letter of that word. ()

FORM P.T. 130 PHILADELPHIA RAPID TRANSIT COMPANY

Name: _____ Badge No. _____ Date Hired: _____ Appointed: _____ Depot _____

Age: _____ Place of Birth: _____ Father: _____ Mother: _____

Schooling: 876 - 1234 - 1234 Dupl: _____ Trade: _____ Last Job: _____

RAILROAD: EL. RY. P.B.T. TAXI:

INSTRUCTION	PRELIMINARY				LINE				FINAL				TOTAL											
	S	C	Days	Cost	S	C	Days	Cost	S	C	Days	Cost	S	C	Days	Cost	S	C	Days	Cost	5	PS	Remarks	
MOTORMAN:																								
CONDUCTOR:																								
OPERATOR:																								

FOLLOW-UP

OPER.	DATE	DATE	CAUSE	SUPPLEMENTARY	COST	OP	SAF	P.S.	REMARKS															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

OPER. SAFETY PR. NAV. _____

DATE SPEC. REPORTS & REMARKS: _____ DATE SPEC. REPORTS & REMARKS: _____

TRANSFERS

Date	From	To	Cause	OPERATION CHECK

SEPARATION Date: _____ Cause: _____ Remarks: _____

OPERATING HOURS

Date Appointed: _____

Conductor	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7			
Motorman																								
Power Ser.																								

ACCIDENTS

Date	Time	Hour	Month	Type	Resp	Per	Inj	Eq	Dam	Summary Oper. Rec.	Con	Not	PS	Cause	Cost	Action	

Absences

C	M	S	R	H	A	B	C	D	S	Exc	Len	Sp	C	W.	S.	P.	F.	H.	Inspection	Specials

Face and Reverse Side of Form Used by Philadelphia Rapid Transit Company to Record a Student Operator's Record from the Time He Begins His Training and Continuing the Follow-Up Checks for Many Months After He Has Been "Turned In"

measurement of elapsed time between signals and responses.

All that can be expected through the use of these tests is to avoid the selection of men who do not have the inherent or acquired characteristics necessary. On the other hand, if proper men can be selected the thorough training methods will develop these characteristics to the mutual benefit of the company and the men in the reduction of accidents. The psychologists believe this can be done and are developing the equipment and methods necessary. The problem of comparative measurement or scoring that can be used as a basis for the rejection of applicants is as important as it is serious. Great injustice might easily be done through a misuse of methods or a misapplication of basic principles.

More Passengers with Higher Fare

Weekly Pass Helped to Produce Simpler and More Profitable Fare at Mansfield, Ohio—Through Riders Increased 18 per Cent

BY WALTER JACKSON
Fare and Bus Consultant, Mount Vernon, N. Y.

MANSFIELD, OHIO, is a city of 32,000 inhabitants. Automobile ownership and use have increased greatly in recent years, encouraged by the high class of labor employed by the Ohio Brass Company, the home-appliance plant of the Westinghouse Electric & Manufacturing Company, the Mansfield Sheet & Tin Plate Company and other industries.

Electric railway service of excellent quality with one-man cars is supplied by the Mansfield city lines of the Ohio Public Service Company. The equipment is well maintained and intelligently supplied in accordance with the needs of the community.

Nevertheless, patronage had been going downhill since 1920. This may have been due in some measure to increase of fares, but undoubtedly the chief cause was the multiplication of automobiles. One proof of the latter is that although an 8-cent cash fare and a 7½-cent token rate (seven for 50 cents) had been

established as early as Feb. 18, 1921, the initial decline was accelerated in following years right up to April 19, 1925, when the City Council approved a new scale as follows:

- A cash fare of 10 cents to replace the multi-coin cash fare of 8 cents.
- A token fare of 8 cents (five for 40 cents) to replace the 7½-cent token.
- A weekly pass at \$1 to yield a low rate to persons using the service for more than twelve rush-hour rides a week.

WHY THE PASS SCALE PLEASSED THE PUBLIC

In the ordinary unit-fare way of securing more revenue through higher rates, every class of rider is unpleasantly affected. Hence there is more community opposition with the frequent result, in walking-distance towns, that the higher fare proves disappointing to the railway in revenue and injurious to the community's business and social activities in reduction of riding.

A different principle was tried at Mansfield. The cash fare of 10 cents, it was pointed out, need be paid only by casual visitors or those automobilists whose cars were in the repair shop.

On the other hand, the person who would be willing to invest no more than 40 cents for five tokens good any time and for as many as five persons still could ride for 8 cents—the fare hitherto paid by one-half the riders.

Finally, those regular or fairly regular patrons who had been riding for 7½ cents would in the future have the privilege of absolutely unlimited service at a cost of only fourteen 7½-cent rides a week.

From this it is apparent that the increase in cash fare was to be offset by a decrease in the cost of rides taken by regular riders or those to whom they transferred their passes. The semi-regular rider buying 8-cent tokens was hardly touched by the change. That this policy of "divide and conquer" proved a good thing for both the railway and the public will appear from the following paragraphs.

INCREASE IN BOTH REVENUE AND RIDING DESPITE HIGHER AVERAGE FARE

In the pre-pass period of 1925, the Mansfield City lines showed the following revenue losses in comparison to the same months one year previous: January, 12

per cent; February, 15 per cent; March, 8.5 per cent; April, 7 per cent.

In the pass-using months, May, 1925, showed the same rate of loss as April, but thereafter to the present period every month has shown gains as follows: June, 15 per cent; July, 20 per cent; August, 16 per cent; September, 14 per cent; October, 13 per cent; November, 29 per cent; December, 21 per cent; January, 12 per cent; February, 22 per cent; March, 19 per cent.

With the old fares, the average rate per through ride ranged between 7.4 and 7.7 cents. Under the new scale, the average fare is about 8 cents. In determining the new average fare it is necessary to reduce the recorded pass rides by 20 per cent to allow for rides that would be figured as free transfers for cash and token passengers.

Although the average fare is higher, the number of through passengers has increased. This is accounted for in large degree by the unusually high proportion of passholders who not only take more rides personally but are also a factor in increasing the car rides by members of their families. An analysis of the February figures will be helpful here:

RIDING AND REVENUE RATIOS, MANSFIELD, OHIO, CITY TROLLEY ROUTES

Revenue ratios	—Before Passes— February, 1925		—With Passes— February, 1926	
	Total	Per Cent	Total	Per Cent
Cash fares (8 vs. 10 cents)	\$5,494	46	\$6,925	47
Tokens (7½ vs. 8 cents)	6,512	54	3,081	21
Passes at \$1 .....	.....	.....	4,560	31
School .....	.....	.....	141	1
Totals	\$12,006	100	\$14,707	100

Riding ratios	Through Rides		Through Rides	
	Per Cent	Per Cent	Per Cent	Per Cent
Cash fares	68,672	43	69,259	36
Tokens	91,168	57	38,506	20
Passes .....	.....	.....	79,058	42
School .....	.....	.....	2,840	2
Totals	159,840	100	189,663	100

From the figures given in the table are derived an average sale of 1,140 passes a week and only 17.3 through rides per pass per week. The exceptionally high sale of passes for a city of this population and the relatively small number of through rides go together. Most of the pass purchasers do not have time to use it for a luncheon ride, but they buy the pass because it is cheap and still gives them the opportunity to take extra rides at night and on Sundays.

In this particular month, February, 1926, the average fare was only 7.7 cents compared with 7.5 cents in the pre-pass month of February, 1925. In general, however, the pass schedule averages closer to 8 cents. The increase in revenue was 22.5 per cent, while the increase in through rides was 18 per cent.

Although 18 per cent more through riders were handled, the work of the car operators was decidedly less. Thus there were 587 more cash riders, but a simple dime usually took the place of the cumbersome 8 cents. The number of token riders was cut by 52,662, producing another great reduction in change-making. Transfers were cut 30 per cent or more.

Since most passholders are persons who probably spent \$1 a week anyway in purchasing the 7-cent tokens, the increase in revenue must be sought for in two directions: From casuals paying 10 cents instead of 8 cents and from the companion rides included by passholders.

It is worth noting that a rate of five for 40 cents

calls for an amount that is beyond the investment desire of a true casual, thus leading him toward the convenient dime. Again, when 1,140 regular riders cease using tokens, it is obvious that they will often pay a dime fare for a companion in preference to making a rather awkward purchase for something they do not need themselves.

Not the least reason for the success of this fare change was the co-operation of the Ohio Brass Company through its house organ, but unquestionably the most important factor was the appreciation by F. A. Chamberlain, district manager, and Walter Goodenough, superintendent, that the pass plan offered a real opportunity to sell rides and increase good will.

Accidents Reduced in California

THREE companies operating in California have reported a reduction in accidents during 1925 compared with the year previous. They are the Pacific Electric Railway, the Los Angeles Railway and the San Francisco Municipal Railway.

The Pacific Electric Railway, Los Angeles, has indicated a reduction of 1,745 accidents of all classes in 1925, equivalent to 16 per cent less than during the preceding year. Analysis of the different classes of accidents shows that vehicular mishaps decreased 14 per cent, step accidents 49.9 per cent, persons struck by cars 34.6 per cent and derailments 31.1 per cent.

The Los Angeles Railway reports a total number of accidents in 1925 of 20,244, against 23,303 in 1924, although car-miles operated in 1925 exceeded those of 1924. Accidents in which street cars and automobiles were in collision were reduced from 8,946 in 1924 to 7,082 in 1925. During the year 343,000,000 passengers were carried, but only 75 sustained what might be termed serious injuries.

The San Francisco Municipal Railway reported 3,101 accidents in 1925, compared with 3,209 in 1924. The item of collisions between cars of the railway showed a decrease of 23 per cent, only 85 being reported in 1925, while 111 occurred during the previous year.

Safety Has Good Year in Rhode Island

ACCIDENTS involving street cars in Rhode Island operated by the United Electric Railways show a decrease in 1925 over the preceding year, notwithstanding the great increase in automobile registration, which advanced 12 per cent.

The following table shows, by groups, the principal accidents with the percentage decrease in 1925 compared with 1924 and 1924 as compared with 1923. In this connection it is interesting to state that the first four months of 1926 show further reductions:

	Per Cent Reduction 1925 Less than 1924	Per Cent Reduction 1924 Less than 1923
All accidents	8.38	26
Claims reduced	17	20.2
Collisions with autos	9.28	19
Collisions with cars	30.02	44.45
Pedestrians injured	28.07	30.2
Fatal accidents	22.02	40

Organized safety was commenced on this property in 1923, and the year 1924 was the first full year that could be compared with previous conditions. For the year 1923 it was found that a most gratifying reduction had been made in all of the more serious classes of accidents, notwithstanding the fact that automobile registration increased 14.7 per cent.

Maintenance Notes

Used Paint Brushes Kept in Good Condition

THROUGH the use of a well-arranged cabinet for keeping paint brushes while they are in use, the Department of Street Railways, Detroit, Mich., has succeeded in prolonging considerably the life of brushes. Whenever a brush is returned from a paint job, it is placed in the sheet iron cabinet shown in the accompanying illustration. This cabinet is 4 ft. x 3 ft. by approximately 15 in. deep and is provided with five shelves.

Access to the cabinet is obtained through two doors, which are hinged at the center and have clasps for locking at either edge. The shelves or pockets for the brushes are pitched toward the back at an angle of about 20 deg. This slanting shelf has two upright divisions running along the front edge. One is directly at the front edge and is 1 in. high, while the second is back about 2 in. and is 2 in. high. This forms a pocket to catch any paint which may drip down as the brushes are wiped clean from drawing them across the upright partition. In addition to these longitudinal uprights, the shelves are also divided horizontally into different sections, so that all brushes which are used in a particular color can be grouped together. The dividing plates keep the colors from mixing.



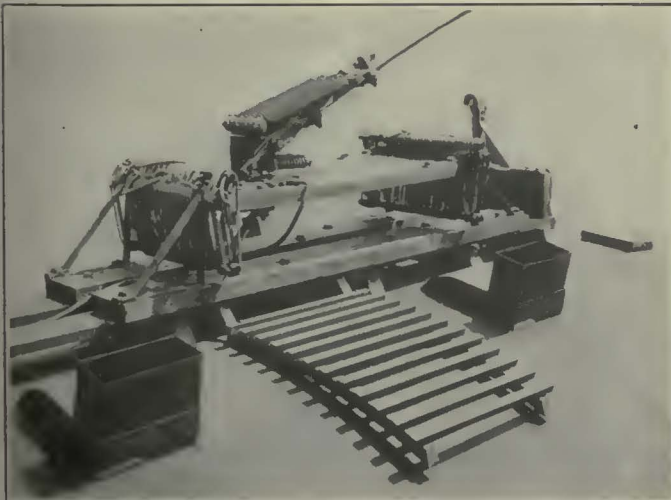
Steel Cabinet Used in the Paint Storage Department of the Department of Street Railways, Detroit, for Keeping Used Paint Brushes

Flexible Trolley Base Suspension Reduces Noise

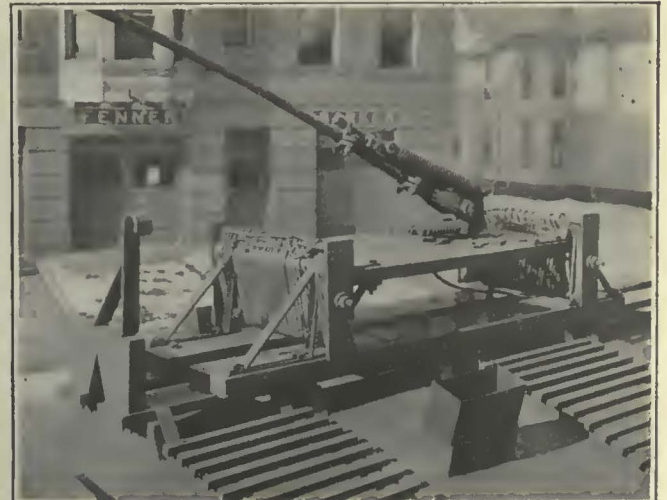
FOR a means of breaking up the vibration transmitted from the trolley equipment to the car body and also to provide a flexible suspension that will permit the wheel to follow the trolley wire easily, the Buffalo & Erie Railway, Fredonia, N. Y., has equipped one of its interurban cars with the type of trolley base support illustrated. This was originated by Thomas Elliott at the request of the railway officials.

With this suspension, the trolley

base is mounted on 2-in. planking, which in turn has a flexible rope support. At the ends of the planking, brackets of ½-in. x 2-in. strap steel are used to hold rods of 1-in. steel tubing. Two similar rods are fastened by steel brackets to the roof boards of the car. At each end of the planking, which supports the trolley base, there are thus three cross-rods; the middle one of the three is fixed to the car roof boards, while the two outside rods are fastened to the trolley base planking. A lacing of impregnated trolley rope binds the rods together and serves as a flexible



Flexible Rope Support Used for Trolley Base on One of the Interurban Cars of the Buffalo & Erie Railway



A Special Fixture Is Used to Hold the Trolley Base Planking in Position During the Lacing Operation

suspension. The rope lacing from the middle rods to the two lower ones serves to support the planking, while the lacing from the middle rods to the two upper ones keeps the planking from rising from its proper position.

The top of the planking on which the trolley base is mounted is about 12 in. above the roof boards of the car. The lower rods are 9½ in. below the fixed rod and the upper rods 2 in. above the fixed rod. With this method of support, the trolley base is held quite rigid and still a small degree of flexibility is provided. The rope lacing serves to break up any vibrations which would be transmitted from the trolley equipment to the car and so reduces noise in operation.

To provide a support for the planking during installation and also to insure that it is located accurately, a special fixture is used. This is shown in one of the accompanying illustrations. It consists of upright plates, held together by rods. The upright plates are fastened to the roof boards of the car at the bottom, while the central portion supports the trolley base planking. With the boards held in position by this fixture, the rope lacing is applied, and after this is completed, the fixture is removed.

Large-Wheeled Acetylene Welding Truck

EASE of manipulation is particularly desirable in connection with welding equipment. The Grand Rapids Railway, Grand Rapids, Mich., has found that the use of large diameter wheels in connection with a mounting for the tanks



Large-Wheeled Acetylene Welding Truck as Used in the Shops of the Grand Rapids Railway

and equipment required for acetylene gas welding makes the equipment easy to push. An accompanying illustration shows one of the welding trucks which has solid rubber tired wheels of 36 in. diameter. The framework for supporting the tanks is constructed of 2½x2½x½-in. steel angles. A 1½-in. strap fastens the tanks to the framework. This strap has a hasp and pin connection, so that the tanks can be readily removed and replaced as desired. The truck is provided with wooden handles, which have also been found desirable for use in cold weather, as cold metal is disagreeable to handle. The rubber tires remove jars from the gages and welding attachments so that in operating over rough floors or tracks these do not get out of adjustment.

Hose Serves as Buffer at Edge of Dipping Tank

DAMAGE to armatures by coming in contact with the edge of the tank while they are being dipped is prevented by a simple method used in the shops of the Erie Railways, Erie, Pa. This is to attach a rubber hose around the edge of the tank. In this case some sections of discarded hose about 2 in. in diameter are used. These are cut lengthwise so as to fit over the edge of the metal tanks. When once in position, the tendency of the rubber hose to close keeps it tightly in position.

New Equipment Available

Asbestos Lumber Dispatching Booths

BOOTHs of asbestos for use in telephone train dispatching on electric railway lines are now being manufactured by the Asbestos Buildings Company, Philadelphia, Pa. These booths are made from Ambler asbestos lumber, which is manufactured from long fiber Canadian asbestos and Portland cement, built up in sheets and consolidated under tremendous hydraulic pressure. The asbestos lumber has set-in patent galvanized brass pin hinges, bolted on, and a galvanized safety hinge clasp is provided for the padlock. The floor is of tongue and groove pine. The booths are shipped in knock-down form and can be erected by



Telephone Booth of Asbestos Lumber with Galvanized Fittings

ordinary labor, without the need of the erection crew and engine which are necessary when concrete booths are constructed along the right-of-way. The asbestos lumber from which the booths are made is fire-proof and cannot rot or deteriorate from exposure to the weather. No paint is required and there is nothing to need repairs, as asbestos lumber becomes harder and stronger with age.

Push-Button Motor Control Developed

BUILT for across-the-line starting of slow speed motors and for reduced voltage starting of higher speed motors, a completely self-contained oil-immersed automatic starter for 2,300-volt synchronous motors has been developed by the Electric Controller & Manufacturing Company, Cleveland, Ohio. To start a motor, the operator pushes a button, and as the motor approaches synchronous speed the field excitation is automatically applied.

The reduced voltage starter consists of an automatic double-throw switching mechanism, a power transformer, potential transformer and the current limit transition relay, all contained in a tank of welded boiler plate. On the outside of the tank there is a dust-proof steel cabinet, which incloses the field switching mechanism, field discharge resistor, timing relay and d.c. field ammeter.



Self-Contained Oil-Immersed Automatic Starter for Synchronous Motors

This cabinet may also contain an automatic starter for operating a magnetic clutch. The full voltage starter is of similar construction except that the starting auto transformers are omitted. This equipment is complete in a single unit.

Safety Zone Markers

OF A TYPE particularly suitable for street car safety zone markings as well as other forms of traffic regulations, Graf-Barton traffic signals have been placed in service in a number of cities throughout the United States. Several types of these signals are available, the two pictured in the accompanying illustration being especially recommended by the makers for safety zone application.

The signals consist of corrugated or smooth traffic buttons in which

sensitive reflecting lenses have been placed, making them plainly visible at all times. As a point in their favor the manufacturers state that the signals are not electric and, therefore, are not subject to the ills of electric systems generally. Each signal is cast in one piece from alloy metal of considerable strength and is mushroom in shape, thus giving the least obstruction to traffic. The various types of Graf-Barton signals are uniform in their general dimensions, being 5 in. high and with a diameter of 15 in. The standard weight is 40 lb. per signal, and approximately fifteen minutes each for installation is required. Four 3 to 4-in. pins are inserted in the paving, while one hole in the top of the signal dome is provided for an anchor bolt for installation purposes.

The city of San Francisco, Cal., has recently purchased 500 of the corrugated types of signals and Los Angeles, Cal., is at present using a like number. Smooth type signals are in use in Birmingham, Ala., and Memphis, Tenn., and in some cases the slow signals have been utilized for street car safety zone purposes as well. Smaller numbers of signals have been installed in other cities and sample orders are being demonstrated in various sections of the country.

At night the reflecting lenses give a brilliant automatic signal. The lens used has been developed after more than a year of research and experimental work in co-operation with various lens factories both in this country and abroad. The reflecting is accomplished by means of a special process of molding the glass, so there is no gilt or mirror backing to peel off or to deteriorate from dampness and other weather conditions.

Welded Steel Tank for Transformer



A Transformer of Oil-Tight Construction Is Inclosed In a Sheet Metal Tank

HEAVY end frame construction and a welded sheet metal tank are outstanding features of a new shovel type transformer just designed by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

Additional bracing is used to prevent the transformer from sliding around inside the tank. This type of transformer is intended for applications where fine dust finds its way into the ordinary transformer and causes clogging of ventilating ducts. These new transformers are manufactured at present at 2,300 volts, single phase, 60 cycles, but it is also possible to obtain them in other voltages.



Plain and Corrugated Types of Graf-Barton Traffic Signals for Safety Zone Use

Association News & Discussions

Wisconsin's Experience with the Indeterminate Permit*

By LEWIS E. GETTLE
Chairman Railroad Commission of Wisconsin

THE Legislature, the commission and the courts have universally agreed in Wisconsin that the very essence and foundation of a complete system of centralized regulation is the indeterminate permit complemented by provisions for municipal acquisition and for monopoly of operation. It is recognized that attempts to provide rates that will adequately take care of amortization in the cases of term franchises have universally failed. The public had no assurance of continued, progressive service, and capital necessarily was timid in the face of uncertainties and hostile contingencies. The new form of permit was an effort toward standardization, permanence and a large measure of security whereby the consumer, the investor and the utility would mutually profit.

The outstanding difference between the new grant and the old is that the monopoly feature of the new can be

*Abstract of a paper presented before the Missouri Association of Public Utilities, May 3, 4, 5, 1926.

changed at any time by the commission through the issuance of a permit to a competing utility. Revocation is perhaps purely a function of the Legislature or a court, but the commission is vested with almost as effective an equivalent. Competition in the utility field is futile, wasteful, exasperating to municipal authorities in constantly creating conditions of unsightly and unsafe construction, and uneconomic as viewed from any standpoint. "Monopoly" from ancient time was and still is to many people highly offensive. The Supreme Court of Wisconsin has clarified the significance of its application to utility service in terms that divest it of all semblance of malevolence and clothe it with positive beneficence. In *Calumet Service Co. vs. Chilton*, 148 Wis. 334, the court says:

We should say, in passing, that the term "monopoly" as thus used is to be taken in the sense of a mere exclusive privilege granted for a consideration equivalent; monopoly only in the sense that the field of activity is reserved to the grantee—the mere element of exclusiveness. A privilege of that sort, where there is a consideration

equivalent to the public, though often spoken of as a "monopoly" is essentially different from one of the character regarded as odious at common law and prohibited in many state constitutions.

So while, in common parlance, it is proper to characterize the exclusive privilege in question, a monopoly, it is one purchased by giving an equivalent to the public, as in case of a patent allowed by the federal government. It is a grant for a public, not for a private, purpose, and not a grant of that which without it would be of common right. It has none of the essentials of the monopoly so offensive, anciently, in the eye of the law.

While perhaps the term exclusive privilege is the better term to apply to the right in question, the word "monopoly" has been used in the books with reference to such franchises.

The increasing public demand for utility service is stupendous. In Wisconsin the demand for capital additions to public utilities, exclusive of railroads and other utilities classed as such, has required \$50,000,000 annually in recent years. The rural communities are actually clamoring for coveted electric service. The companies are just beginning to study and to meet these rural demands. When a utility must market its bonds at 75 and pay a high rate of interest it must amortize the bond discount and get the money to pay the interest out of consumers during the life of the bond. The form of franchise has a direct bearing on and relation to the economy of financing.

I have been accorded the liberty of

SUMMARY of Mr. Gettle's Views as Expressed in a Report Prepared by Him as Chairman of a Special Committee on Uniformity of Legislation of the National Association of Railroad and Utilities Commissioners at Phoenix, Ariz., in November, 1924.

THE fixed-term franchise is the product of a bargain arrived at between the municipality and the public utility promoter, at best with each of these striving for the best bargain available from his own standpoint and each subject to the human limitation of being unable to forecast the future with certainty as to just what changes in the conditions of performing public service will be brought about by the development of the public utility, new improvements, new inventions affecting the service and its cost, the growth in population of the municipality, etc.; at worst such a bargain has, by reason of either the faithlessness or the inefficiency of public officials, resulted in a subordination of the rights of the city and the public to the private interests created by the franchise. At all events a fixing of rights and duties of the utility by such bargaining has proved a hopelessly inadequate method of dealing with a very simple situation.

The franchise in theory has but one purpose and in practice it should be made for that single purpose. It is the grant of a right to use the public streets and highways in the interest and service of the public, and in the last analysis it is only the interest of the public which should be considered in determining its provisions. It is granted not for the purpose of enabling private persons to carry on a private business, but for the purpose of securing adequate public service at reasonable rates of charge therefor. Private interests, whether they be those of the public utility owner, or those of the investor in public utility securities, are created merely as a means to that end.

For the purpose of securing such public utility service as is desired, of course private capital and initiative must be

attracted to the enterprise, and to determine whether it would be attracted by allowing the opportunity of earning a liberal return upon the investment, or whether it be attracted by reducing the risks to a minimum, and decreasing the amount of the return in proportion, the interests of the public must be consulted. And since the state has the power and the means of reducing the risks of the public utility business to a minimum, and in turn attracting into public utility investments capital at a correspondingly cheaper rate, and since the state may thereby reduce the cost of public utility service to the consumer, and extend the opportunities of securing it to a wider portion of the public, the public interests demand that such means and such power be employed.

This is the direct purpose and the direct effect of the indeterminate permit. The interests of the public emphatically do not warrant hanging over the head of the public utility the warning contained in the fixed-term franchise that at the end of the term the municipality, for any or for no reason, may see fit to deprive the public utility of the use of its equipment except as it may be removed from the streets or disposed of at such market as may present itself. Such treatment amounts to an injection by the state into the public utility business of a wholly unnecessary and unjustifiable risk, and can be indulged in only at the expense of discouraging capital investments in public utility enterprises, thereby resulting in necessarily higher rates of charge for public utility service and an impairment of the ability on the part of companies furnishing that service to improve and extend the same as may be required by the demands of public convenience and necessity.

quoting from communications received within a week from banking houses on this subject.

I quote from "Time and Money," by H. V. Bozell of Bonbright & Company, New York, being a statement made Dec. 4, 1925, to the Illinois legislative committee investigating the indeterminate permit:

There is no doubt that the life of the franchise has a very direct bearing upon not only the cost of financing but also the question as to whether sound financing is possible.

The indeterminate life of a terminable permit, together with the provisions for public acquisition or other guarantee in case of termination, allows long term and consequently cheaper financing—cheaper both in actual price and in the saving due to the absence of necessity of refinancing frequently. It also has a tendency to keep the investment banker "on the job," so to speak, to keep in contact with the company, to be assured that it is constantly giving satisfactory service so that there will be no probability of the termination of its franchise with a consequent weakening of the position of the securities which he has marketed.

That such an argument is not merely hypothetical is graphically portrayed in an instance which came to my attention just two or three years ago. One of the largest, most conservative and most astute investing institutions in America was considering the purchase of a large block of bonds of a company in Oklahoma. The purchase was decided against on account of the franchise situation there. Subsequently, Oklahoma passed her indeterminate franchise law, and on account of that and that alone this large institution decided to purchase the very block of bonds which had previously been decided against.

In the early history of the indeterminate permit private utilities apparently were apprehensive that the public would abuse or use recklessly the new power to buy utilities through easily usable methods and at trifling procedure expense and that such power might be employed to harass companies which did not enjoy pleasing and satisfactory public relations. But the commission early took the position that only where satisfactory service at reasonable rates was utterly impossible or where a utility persistently disobeyed or flouted the orders of the commission would it exercise its power to authorize a competing utility. This position has been maintained consistently even as to cities which desired to do their own lighting for the reason that it was practically shown that the existing utility could perform the service more cheaply and better if the commission's orders were complied with. I recall only one case where a certificate of convenience and necessity was issued to a competing company. This was where a miller incidentally had some surplus water power which he used to furnish current during the summer months to cottagers around a small lake but could not very well increase his power sufficiently to reasonably serve the town for which he had an indeterminate permit. A competing company could give 24-hour service at about one-half of the miller's charges and the company was granted an indeterminate permit.

Under present laws, there is no sale of a franchise by bid or otherwise, and no payment of percentage of gross earnings into the municipal treasury. The franchise has no monetary or property value either for rate-making or purchase purposes, yet it is of such character that the privilege may be defended and protected from invasion or usurpation by every arm of the courts

COMING MEETINGS

OF

Electric Railway and Allied Associations

June 9-16—American Railway Association, Mechanical Division, annual convention, Atlantic City, N. J. Car matters, June 9-11; locomotive matters, June 14-16.

June 10-11—Advisory Council conference electric railway executives, Eastern region, starting 3 p.m. June 10, Engineering Societies Building, 29 West 39th Street, New York City.

June 21-25—American Society for Testing Materials, annual meeting, Haddon Hall, Atlantic City, N. J.

June 25-26—New York Electric Railway Association, annual meeting, Hotel Champlain, Bluff Point, N. Y.

June 28-July 2—Central Electric Railway Association, summer meeting, S. S. South American, Buffalo, N. Y., to Chicago, Ill.

July 8-10—Midwest Electric Railway Association, annual convention, Brown Palace Hotel, Denver, Colo.

August 12-13—Wisconsin Public Utility Association, Railway Section, La Crosse, Wis.

Oct. 4-8—American Electric Railway Association, annual convention and exhibits, Public Auditorium, Cleveland, Ohio.

in law or equity. Very occasionally the ghosts of the old provisions arise and assert themselves in rate and purchase cases. The commission, justly we think, allows claims made for franchise purchase costs, but only to the extent that the cash was actually and honestly paid.

Every member of the Railroad Commission since its inception has strongly favored the indeterminate permit form franchise. Halford Erickson, former commissioner, then and now an eminent utility economist, presented a discussion on this subject in 1914, which is an exceedingly valuable early contribution. I quote his concluding observation:

When everything has been said, however, the fact remains that the indeterminate permit as a form of franchise affords more protection to both the public and the utilities than any of the various kinds of franchises by which it was preceded.

John H. Roemer, former chairman, in his address before the Southern Gas convention at Mobile, Ala., April 3, 1908, vigorously supported the new form of permit but stressed the prerequisite for its successful administration a skilled, judiciously minded personnel on the commissions.

Carl D. Jackson, former chairman of the Wisconsin Commission and president of the National Association of Railroad and Utilities Commissioners, in his annual address as such president, at Detroit, Mich., on Nov. 14, 1922, said:

A limited term franchise is notice that at some future date the municipality or state may see fit to treat the utility property and legitimate investment in public utilities on the junk value basis. Such

possibility discourages incentive, improvements, extensions and good service and at the same time increases the cost of all financing.

The Wisconsin Supreme Court has not only established the indeterminate permit in legal security but has added its commendation of the social and economic aspects.

In *La Crosse vs. La Crosse G. & E. Co.*, 145 Wis. 408, the court said:

The aim of the Wisconsin indeterminate law was to displace existing public utility franchises by new, direct grants from the state of a uniform character free from the peculiarities of old franchises prejudicial to the dominant end in view; the best service practicable at reasonable cost to consumers in all cases and as near a uniform rate for service as varying circumstances and conditions would permit; a condition as nearly ideal probably as could be attained. . . . That such a complicated situation has been met by written law in such a way as to avoid successful attack up to this time on the validity of the law or any part of it, and avoid attack at all, either upon the law or its administration, except in a few instances, and secure optional submission by many owners of old franchises to the displacement of the privileges—is quite a marvel; reflecting credit upon the lawmaking power and the body charged with the onerous duty of administering the statute.

The public utilities of the state seem to be a unit in approval of the law. There is some dissatisfaction and restiveness regarding the valuation methods of the commission, the utilities claiming that the commission undervalues and the public resisting advances in valuations. While the commission's functions and powers have quite often been attacked by bills in the legislature, the tendency has been strongly toward strengthening the utility laws. There has been no retrogression in any essential regard.

The Socialist party, rather dominant in Milwaukee and unwaveringly hostile to all commission regulation, frankly hails any weakness or alleged failure of the law or its administration with satisfaction because it thinks it may hasten universal public ownership—its ultimate goal. Even the Socialists have little or no criticism of the indeterminate permit, but they want the city authorities to administer it.

I cannot summarize my views more clearly than I expressed them in my report as chairman of the special committee on uniformity of legislation of the National Association of Railroad and Utilities Commissioners at Phoenix, Ariz., in November, 1924. I may say most of my colleagues refused to join in my proposed report and the convention refused to approve it because it was thought to be too sharply out of accord with the fixed faith in the term franchise employed in the home states.

Attractive Program Arranged for Bluff Point

BLUFF POINT, on Lake Champlain, N. Y., is such a beautiful spot that it is hard to imagine a convention there without an entertainment program which will suit everybody. Such a program has been arranged for those who expect to attend the 44th annual convention of the New York Electric Railway Association, to be held there on June 25-26.

On account of the fine links at Bluff Point, golf will be the principal form of outdoor sport, and a tournament will be held on Saturday, June 26. There

will also be a ladies' putting contest.

While many will probably drive by automobile to Bluff Point, special Pullman accommodations, consisting of two compartment cars and three 12-section-drawing room cars will be attached to the New York Central train No. 31, leaving New York at 8 p.m. Eastern standard time on the night of June 24. These cars will be set out on the private

siding at Bluff Point, on their arrival there, so it will not be necessary for passengers to leave the train. One of the standard sleeping cars will return to New York Saturday night. The other cars will leave Sunday night. C. H. Beck, Westinghouse Traction Brake Company, 150 Broadway, New York, has charge of the Pullman and transportation arrangements.

conveyance. Their attitude, if continued, will result sooner or later in causing a general decentralization of retail business." An abstract of the report of this committee is published in the news pages of this week's issue of the JOURNAL.

Charles Gordon, editor ELECTRIC RAILWAY JOURNAL, said that the subject of increasing the efficiency of passenger transportation in city streets was a broad community subject and that progress toward the solution of the problem would not be made until all those affected stop seeking their own selfish advantage and consider the problem in the light of what would be best for the community as a whole. He cited the opposition of merchants to parking restrictions and skip-stop car operation as examples of this feeling.

Elimination of traffic bottle-necks was held to be even more important than restriction of parking by Louis Deblois, National Bureau of Casualty and Surety Underwriters. He expressed some doubt about the amount of extra space that would be obtained for moving traffic by forbidding vehicles to stand along the curb for long periods. This was answered by Mr. Miller with figures showing that parked automobiles in some cases take up as much as two-thirds of the effective roadway, and that instances of such use of one-quarter to one-half of the available space were common.

H. H. Dunn, the Beeler Organization, New York City, spoke briefly concerning investigations showing the means of transportation used by Westchester residents in reaching New York City. Other speakers included E. N. Johnston of the American Gas Accumulator Company; Max Miller, contractor, and E. K. Thompson, consulting engineer.

C.E.R.A. Delegates May Return Home by Boat

AROUND TRIP by water can be made by delegates attending the Central Electric Railway Association convention. Arrangements for the return trip have just been made by the committee in charge. The return voyage will be on the same boat. Just 24 hours layover will be allowed in Chicago and delegates making the return trip will be permitted the use of these accommodations, although no meals will be served while in port at Chicago.

The convention trip will be officially over upon arrival at Chicago, Friday afternoon, July 2. The *S. S. South American* will lie at the dock until 4 4 p.m. Saturday, July 3. For those who have not made reservations the rate will be \$85 from Buffalo to Chicago and return, \$76 from Cleveland and return and \$72 from Detroit and return, including meals and stateroom accommodations. If reservations have been made, the return accommodation can be had for the difference between these rates and the convention one-way rates.

New York Railroad Club Outing

THE New York Railroad Club has changed the date of its midsummer outing from July 15 to July 8. A number of new "stunts" are promised for this meeting by the committee on entertainment.

Engineers Debate Parking Restriction

Better Use of Existing Streets Rather than Creation of New Ones Is Proposed to Relieve Traffic Congestion—Common-Carrier Vehicles Can Be Used Advantageously to Replace Private Automobiles

INCREASING the efficiency of passenger transportation in city streets by making the entire roadway available for moving vehicles was the subject of lively discussion at a meeting of the American Society of Civil Engineers held at New York June 2. Representatives of the electric railways, the Regional Plan of New York and Its Environs, the police department and various other agencies contributed their views. Better use of existing streets rather than construction of new streets was held to be the most practical method of relieving traffic congestion.

A paper dealing with parking regulation and its effect on city transportation was presented by John A. Miller, Jr., associate editor ELECTRIC RAILWAY JOURNAL. Use of the public streets for the storage of private automobiles is tolerated, he said, only because of an exaggerated idea of their importance in the general transportation plan. Traffic counts in several large cities show that public transportation vehicles are carrying upward of 75 per cent of the total traffic, although they constitute only about 15 per cent of the total number of vehicles. Retail trade suffers greater loss now on account of traffic congestion than would be occasioned by the elimination of parking.

Most wasteful of all vehicles used in passenger transportation is the taxicab. Investigations made at various locations in New York City indicate that the average load is less than one passenger. Approximately half the taxicabs were cruising without passengers. He suggested reduction or elimination of parking and substitution of buses in many instances in place of private automobiles and taxicabs. An abstract of this paper was published in ELECTRIC RAILWAY JOURNAL, May 8.

Discussing this paper, Harold M. Lewis, executive engineer Regional Plan of New York and Its Environs, gave figures showing the relation between speed and the number of vehicles per lane per hour, as determined from traffic surveys made in New York City. Charles Rufus Harte, president American Electric Railway Engineering Association, said that the value of the parking privilege from the viewpoint of the retail merchant depends not so much upon the actual curb length available in front of the store as it does upon the distance from the store to the center of gravity of the entire parking area. In his opinion the time is not yet ripe for any real

solution of the parking problem. He believes that the situation will work itself out to a considerable extent. Electric railway traffic in the last year or two has been materially increased because of the difficulties and dangers of driving automobiles in congested districts. Development of electric railway service to such a point of convenience and attractiveness that a still larger number of people will prefer it to the use of private automobiles or taxicabs was mentioned in his talk as one possible way by which relief might be obtained.

As an intermediate step between the present lack of street parking regulation and the type of regulation which might be considered as ideal, W. E. Thompson, vice-president Third Avenue Railway system, suggested the elimination of parking during rush hours only on one side of important streets. He called attention to the results of an investigation made by the Department of Commerce showing that retail merchants all over the country are beginning to realize that congestion is hampering their business. Lieut. William A. Lochman of the Traffic Division of the New York Police Department expressed himself as favorable to a plan to eliminate parking on one side of important streets during rush hours. He admitted that the parking situation is a serious problem and mentioned the difficulty of enforcing the limited time parking regulation, but said that he thought that total elimination of all parking in the congested district was too drastic a step to be taken at this time.

CONGESTION IS CAUSING DECENTRALIZATION

W. G. Strait, vice-president New York Railways, spoke of the work of the Manhattan surface line operators' traffic committee. "We believe that parking ought to be confined to one side of one-way streets and that it ought to be prohibited on thoroughfares south of 65th Street where street cars and permanently established bus lines operate," he said. "The merchants, or some of them, are the principal champions of parking. They are so solicitous of the luxurious comfort of the lady who drives up to their stores in a private sedan that they inadvertently are doing their utmost to make their stores, and, in fact, the entire midtown section, inaccessible to the thousands of her sisters who travel by foot and public

California Electric Railway Men Hold Semi-Annual Meetings

MEETINGS of the superintendents, engineering, purchasing and stores, accounting, and public relations committees of the California Electric Railway Association were held in San Francisco May 20-22, 1926. The dis-

cussions centered on public relations, present-day bus operation, storekeeping methods, and overhead construction. The matter of radio interference by electric railways was discussed at some length, and a committee was appointed to make investigations, conduct tests and report findings and recommendations to the members.

American Association News

Manufacturers' Executive Committee Organized

L. S. STORRS, managing director of American Electric Railway Association, has just announced the organization of the committee of manufacturers' executives to direct activity leading to the improvement of electric railway cars. Organization of such a committee was decided at a general meeting of car and equipment manufacturers held in New York last fall. This, in turn, was the outgrowth of the meetings of manufacturers arranged during the convention last fall at Atlantic City by Mr. Storrs and by ELECTRIC RAILWAY JOURNAL.

Members appointed on this committee are as follows: M. B. Lambert, Westinghouse Electric & Manufacturing Company; E. P. Walker, General Electric Company; T. W. Casey, National Pneumatic Company; George Frey, J. G. Brill Company, and E. C. Faber of the Barron G. Collier organization. A meeting of the committee is planned for the near future. One of the first subjects to come before it will be action on the report made by the special committee of manufacturers' engineers, which was also appointed at the New York meeting, to undertake a study of car design looking toward reduction in the number of sizes and types of bodies and equipment demanded by the electric railway industry. The work of this committee has been completed and its report turned over to Mr. Storrs pending organization of the manufacturers' executive committee, which has now been appointed.

Equipment

THE final meeting of this year's equipment committee was held at the American Electric Railway Association headquarters, New York City, on June 3 and 4. Those present were: Pierre V. C. See, chairman; Daniel Durie, sponsor; Clarence W. Squier, secretary; Walter S. Adams, W. W. Brown, R. S. Bull, A. L. Broe, A. T. Clark, R. W. Cost, M. R. Hanna, J. M. Hipple, Joseph C. McCune, J. S. McWhirter, E. S. Sawtelle and H. S. Williams.

In connection with Subject No. 1, which included a review of existing standards and specifications, it was decided to include two new designs of air-brake shoes for the American Railway Association's wheel contours in the Manual. In addition to these shoes,

necessary standard head, key, brake-head gages and brakeshoe gages are to be included.

Some corrections and changes have been decided upon in connection with standard designs of journal bearings. In making these changes, it was decided to have a single drawing for all journal bearings and to provide a table of dimensions for each bearing. The drawing was submitted and the table of dimensions was approved by the committee.

Recommendations of the Central Electric Railway Master Mechanics Association, relating to dimensions for height of platforms and bumpers for interurban cars, automatic couplers and specifications for end connections were considered. Some of the changes recommended by the C.E.R.A. were thought to require further investigation and the committee decided to continue this subject for another year.

Specifications for gears and pinions were discussed at considerable length and it was decided to include tooth forms for the long and short addendum spur and helical shapes in the specifications. Distinguishing marks for different tooth shapes of spur and helical gears were also decided upon, together with a table giving different rim thicknesses for different pitch gears.

In connection with Subject No. 2, which included air brakes and air-brake rigging, specifications for certain parts under existing miscellaneous methods and practice were decided upon and will be recommended for standard. A new miscellaneous method and practice entitled "Air Brake Equipment—Inspection of Brakes," was also approved.

In considering the subject of car painting, a very complete report was presented by Mr. Bull. This was approved and will be included in the final report.

An inspection schedule for buses was also approved and will be recommended for inclusion in the Manual as a recommended practice. To provide a limit at which gearing should be removed, gages have been developed by Committee No. 5. These gages permit operators to determine easily when the gearing has reached its useful life.

In connection with the boiler code adopted by the American Society of Mechanical Engineers, and which the sub-committee of the equipment committee has been following, it was reported that agreement had been reached to include 16-in. diameter reservoirs in the classification of those with 1-in. wall.

Specifications for wool waste were presented and approved by the committee and will be submitted as a recommended specification. A report on motor leads and supports was also accepted.

In connection with the study of cars and car equipment with the idea of improving the appearance and convenience to passengers, lighting tests and demonstrations of lighting effects, were made by various manufacturers' representatives at the De Kalb Avenue shops of the Brooklyn-Manhattan Rapid Transit Corporation on Thursday night. This study is being made in order that the committee can recommend certain fundamentals that appear desirable to be included in general specifications for cars in regard to lighting equipment.

Space Application Blanks for Convention Sent Out

DIAGRAMS showing the booth layout, together with application for space at the convention to be held at Cleveland, Oct. 4 to 8, inclusive, were sent out June 1 via registered mail by the exhibit committee of the American Electric Railway Association. As in previous years, a 30-day time limit has been set for the return of applications. All space requests received at association headquarters up to the close of business June 30 will be awarded space by the exhibit committee, which is scheduled to meet the early part of July to make the official space assignment. Applications received after June 30 will be assigned space in the order of their receipt by the director of exhibits.

Ample space has been provided for all classes of display. The plans contemplate the full use of both floors of the Cleveland Public Auditorium. In addition, a steel structure, to be known as the Auditorium's West Wing, with an ornamental stucco facade, and planned to conform to the architectural lines of the auditorium, will be erected immediately adjacent to the auditorium. In all, there will be available 111,902 sq.ft. of space in both buildings, distributed over 312 booths. Last year at Atlantic City it was possible to provide only 100,000 sq.ft. of space.

In the auditorium proper there are 156 booths of varying sizes, containing, in all, 43,465 sq.ft. of space. In the Auditorium's West Wing there are 148 booths, covering in all 62,077 sq.ft. In addition there are eight large booths outdoors for operating exhibits of steam shovels, caterpillar cranes, earth borers, tie tampers, welders and other maintenance of way operating exhibits, as well as 1,500 lineal feet of track space for the display of street, rapid transit, interurban, gas-electric, gasoline, crane, dump and other car exhibits. The track space has been divided off into 10-ft. units, in order to accommodate equipment of varying lengths. Should space requests be such as to make it advisable to provide for additional square footage, it will be necessary only to lengthen the Auditorium's West Wing. There is ample city property immediately adjacent which has been placed at the disposal of the association for such use.

The News of the Industry

Mayor Vetoes Richmond Franchise

Mayor Bright of Richmond, Va., vetoed the blanket franchise for the operation of the Virginia Electric & Power Company. The Common Council has been called in special session by President Fred H. Powers to act on the veto, and the general consensus of opinion is that both the Council and the Board of Aldermen will over-ride the Mayor's veto.

The Mayor states in his veto message that he approves the ordinance in every particular save that referring to tax on gross revenue. He declares that the proposed reduction will mean the loss of approximately \$70,000 a year in revenue to the city, and suggests that the Virginia Electric & Power Company should be required to pay its proportion of the expenses of increased outlay in the conduct of a growing city. The Mayor says it is manifestly unfair to reduce the tax against the traction company without making a move toward similar reductions in taxes for other corporations.

The existing rate of tax paid by the traction company on its gross revenue is 6½ per cent. The company argued for a tax of 3 per cent. The 5 per cent tax is a compromise. The proposed tax it to be graduated downward for a period of ten years until it is 3 per cent, at which it is to remain for twenty years, the life of the proposed blanket franchise being 30 years.

Mariemonters Prefer Electric Railway Service

Definite plans for the operation of the Cincinnati, Milford & Blanchester Traction Company by the Cincinnati Street Railway, Cincinnati, Ohio, will be worked out as soon as Edgar Dow Gilman, city railway director, has acted on the request of the railway to purchase the traction line, which operates between Cincinnati and Milford. Meanwhile, at a conference of officials of the railway with residents of Mariemont, the suburb served principally by the Cincinnati, Milford & Blanchester Traction Company, patrons expressed the opinion that they favored electric railway transportation over bus service because the railway was more dependable. Under the plan as outlined by Walter Draper, president, the Cincinnati Street Railway would buy the tracks, poles and wire for \$49,000 and would lease the rolling stock and buy the power.

The Cincinnati, Milford & Blanchester line recently was sold by the Kroger interests to a Toledo syndicate headed by L. G. Van Ness, formerly president of the Cincinnati, Lawrenceburg & Aurora Street Railroad, and now in charge of operations of the Cincinnati,

Georgetown & Portsmouth Electric Railroad.

In a letter to the director of public utilities Mr. Draper explained that the Cincinnati, Milford & Blanchester traction line had operated years ago to Blanchester, but that portions of the line had been abandoned, until at present it embodies 11 miles of track in all and a carhouse at the terminus in Madisonville at Erie Avenue and the Pennsylvania Railroad crossing. Mr. Draper said the traction line now operated three modern cars on a half-hour schedule and was owned by the Cincinnati Suburban Power Company. If the street railway bought the tracks, poles and

wire, the power would be bought from the Suburban company, while the rolling stock would be leased from the Cincinnati, Milford & Blanchester Traction Company.

Mr. Draper expressed the opinion that the road could be made to pay. He said that his company had been urged by residents along the route to take over the operation of the system. The Cincinnati, Milford & Blanchester Traction would link up with the system operated by the railway, which contemplates operating a bus line in connection with the interurban service. All this hinges, however, on the approval of the director of public utilities.

Franchise Draft Presented

Kansas City Document Before City—Sliding Fare Scale Suggested with Extra Return for Economical Operation

WILLIAM G. WOOLFOLK, representing the reorganization interests of the Kansas City Railways, Kansas City, Mo., on May 25 submitted to Judge H. F. McElroy, City Manager, a proposed new 30-year franchise. In the new plan a valuation of the properties of \$33,000,000 was assumed as a basis, it being provided that the 7-cent fare be retained for the present.

In the Jost franchise, now in effect, the general provisions for track extensions are thought to be rather too liberal. The new plan provides for track extensions by ordinance of the city "accepted by the company."

Judge McElroy recently warned the officers of the Kansas City Public Service Company, the proposed successor to the Kansas City Railways, that no financial concession may be expected from the city. Hence, the proposed plan retains the provisions in the old franchise in connection with the paving and cleaning between tracks, viaduct rentals and street car licenses.

The plan also provides for the creation of a barometer fund of \$600,000. Any excess earnings, over and above the \$2,310,000 a year, will be added to the barometer fund. Whenever that surplus fund is more than \$900,000 at any quarter, the fare will be reduced to the next lowest step in the scale, on the first of the following month.

The provision for earnings in connection with the ten various fares suggested is so arranged as to stimulate the practice of economy to reach points where lower fares may become effective, inasmuch as the franchise provides for higher earnings on the lower fares. For the period during which the cash fare is 5 cents, the return shall be at the rate of 8½ per cent per annum; when the 6-cent fare is in effect the return shall be 8 per cent; for the 7-cent fare, a return of 7½ per cent and,

for the 8-cent fare, a return of 7 per cent per annum.

The new company's return is to be made cumulative after Jan. 1, 1928, under the proposed franchise. After that date, any deficiency in the 7 per cent earnings will be paid from future gross earnings and will draw 7 per cent interest in addition.

BUS OPERATION WILL BE CONTINUED

The bus system, started a few months ago by the receivers of the Kansas City Railways, is to be retained under the new plan, and the present bus franchise is made a part of the proposed franchise. Universal transfers between bus and street car are to be continued.

Replacing the old and intricate system of a city board of control and city representation on the board of directors of the operating company, which was in vogue before the advent of the receivership, the new officials have provided that the city shall receive the same reports as rendered to the president of the company and will have the right to make independent audits.

Interurban provisions of the old franchise are retained, and it is provided that the new company shall spend not less than \$2,000,000 during the first three years for rehabilitation of the railway system.

In addition, the city is granted the right to buy the property on a basis of \$33,000,000 plus any additions to the property and the capital that shall have been made in the interim. The franchise is made to terminate on Jan. 1, 1956, eliminating the necessity for a popular vote, which is required for all franchises of a duration of 30 years or more.

Judge McElroy announced that he would confer with the members of the

Council, and that he would set a date for an informal hearing to be held on the franchise after that conference. He is said to be anxious to consider seriously any reasonable proposal and

to desire settlement of the project at the earliest possible date commensurate with the details involved. Mr. Woolfolk supplied printed copies of the proposed franchise.

time to consider suitable measures is at hand. The carrying capacity of our streets is now sorely overtaxed. Relief ought to be afforded before the situation is complicated by a further influx of unregulated traffic.

Parking prohibition, which need not interfere with proper loading or unloading, would automatically release for moving traffic two additional lanes of travel on every thoroughfare to which they were applied and also would discourage the movement into the restricted area of thousands of motor cars that are now parked there unnecessarily. Offsetting any inconvenience which such restrictions might impose on a comparative few is the great gain which unquestionably would accrue to the general public through the speeding up of all forms of traffic.

Unless we are willing to admit that motor car owners constitute a specially privileged class, parking can hardly be considered an inalienable right. Surely, if the city may restrict the height of buildings erected on private property and say what kind of business they shall or shall not be used by, as, fortunately, it may do under the building and zoning laws, it may quite properly prohibit the use of its own streets for the storage of automobiles.

Only One Remedy for Traffic Congestion

New York Committee Holds Streets Were Built Primarily to Facilitate Traffic Movement, Not for Parking—Makes Earnest Plea for Recognition of Rights of Majority, Non-Users of Autos

ACCORDING to the preliminary report of the Manhattan surface line operators' traffic committee the traffic problem of the Borough of Manhattan, New York, will not be solved until its primary cause is recognized and a suitable remedy applied. About this problem the committee feels:

It will not be solved by demolishing hundreds of millions of dollars' worth of masonry from one end of the island to the other in order to construct new thoroughfares.

It will not be solved by chopping down trees and encroaching on our open spaces in order to lay new miles of asphalt.

It will not be solved by bridging over street intersections or by building elevated roadways or by reducing the width of sidewalks or by lopping off ornamental fronts from residences.

The committee points out that Fifth Avenue was widened some dozen years ago and today is more congested than ever. More recently, First Avenue was transformed into a wide, well-paved thoroughfare. Lafayette Street, Park Avenue and Varick Street have all been utilized in the city's quest for additional lanes of vehicular travel. Says the committee:

Each of these improvements was highly desirable, but collectively they failed of their primary purpose, the relief of traffic congestion, for the simple reason that New York is always confronted with an excess of traffic which may be described as pent-up, awaiting the opportunity to utilize additional roadway space.

No one who has devoted any study to the traffic situation can doubt that within 30 days after the opening of a new longitudinal thoroughfare the congestion would be as great as it is today. If one does doubt it, let him consider traffic conditions on our crosstown streets, of which there are more to the mile than in any other city, and which, in spite of this fact, are even more crowded, at least in the midtown section, than the longitudinal routes.

The committee is of the opinion that the cause of traffic congestion cannot be found in the growth of population. It says that while there has been a considerable gain in the metropolitan area as a whole during the past decade, the recent state census revealed an actual decrease in Manhattan, where the situation is most acute. Nor is business activity primarily responsible. It may be a contributory factor, but the congestion has increased steadily under all manner of business conditions—good, bad and indifferent. Furthermore, congestion in those sections of the city where the pleasure car predominates is noticeably worse than in districts given over largely to trucking. On this subject the committee says:

The private car riding habit is responsible for nine-tenths of the congestion. The automobile has brought comfort and happiness to many millions of people and prosperity to thousands of others, but it certainly has played hob with city traffic.

Before its advent and, indeed, until every other family owned a car, people living in and near cities traveled in public conveyances between their homes and the point of interest, which might lie in a business section, the shopping center or the amusement district. Now, however, as

many of them as can conveniently find roadway space travel between their homes and the point of interest in private cars.

The number of private cars now seen on downtown and midtown thoroughfares represents only a small proportion of the total number in the metropolitan district. The rest are kept out of the congested sections by lack of roadway space. Whenever a street is widened or a new one opened a few more are able to trickle in, with the net result that they and not the general public are benefited.

The committee wants the public and the public authorities to know that this is what has happened time and again and that it is what will continue to happen until the necessity of restricting or discouraging the influx of private automobiles in congested sections is recognized.

A check of vehicular traffic on one of the principal thoroughfares reveals the fact that the average private automobile and taxicab carries 1.7 persons, exclusive of chauffeur. The roadway space occupied by an automobile is about 72 sq.ft., so each passenger takes up 42 sq.ft. of city street.

The average street car occupies approximately 320 sq.ft. It seats more than 40 passengers and carries more than 80 when filled. Larger cars have a relatively higher seating capacity. The proportionate part of the street space required for each seated passenger is about 8 sq.ft.; when the car is filled each passenger takes up only 4 sq.ft. or less. The amount of roadway space required to transport a person by private automobile is, on the average, seven or eight times as great as is required to transport him by street car. Significant as are these figures they tell only a part of the story, for according to the committee they ignore the fact that the average private automobile in the congested sections occupies roadway space not only when its owner is in transit but when he is in his office or a theater, a store or a restaurant. In conclusion the committee says:

This brings us to the crux of the traffic situation—the parking evil. On any street where traffic is dense, lines of parked cars can be seen along each curb. The number of travel lanes on these thoroughfares is thus reduced one-third to one-half, depending upon the roadway width of each.

There can be no traffic relief so long as this condition exists. The problem would be solved overnight if we could bring ourselves to tackle it fearlessly and intelligently and with a determination to consider the vital interests of the general public rather than the convenience of a few.

Many if not a majority of these parked cars are owned by residents of other boroughs and the suburbs. When the vehicular tunnel to New Jersey is opened next fall the number of non-resident motorists who add daily to the congestion on Manhattan's streets will be increased materially. Their ranks will be augmented also by fleets of interurban buses, collecting passengers at the curb in the shopping and theatrical districts. Many of these buses are already in operation.

If parking is to be prohibited or restricted on congested thoroughfares, the

\$10,000,000 Skokie Valley Route Opened

Saturday, June 5, one year almost to the day from the date construction was begun, saw service started on the new \$10,000,000 Skokie Valley route of the Chicago, North Shore & Milwaukee Railroad. A special train carrying a party of newspaper men and company officials left Chicago Friday morning on a final inspection trip.

Described by President Britton I. Budd as "an event of great importance in the development of the Chicago Metropolitan District," the opening of the new line will place within commuting distance of the Chicago Loop a large area to the west of the Shore Line route of the North Shore Line hitherto inaccessible through lack of transportation facilities.

The Skokie Valley route will also furnish high-speed express service between the Chicago Loop and Libertyville and Mundelein and will reduce the running time of limited trains operating between downtown Milwaukee and Chicago. Express service on the old Shore Line route between Chicago and Highwood and Waukegan will be maintained, but the through Chicago-Milwaukee limiteds will be operated over the new line, connecting at North Chicago Junction with Shore Line trains. Four trains will be run every hour in each direction on the Skokie line.

Completion of the project under the direction of D. H. Howard, engineer of construction, in less than a year is declared by engineering experts to be an outstanding example of speed and efficiency. Work trains have been operating daily over the new line with electric power from the five new automatic substations, furnishing tests to insure maximum operating efficiency in regular train service.

Nine passenger stations of unique Spanish design were built, 48 miles of track laid, 138 miles of wire strung and 469 catenary bridges, comprising 1,200 tons of steel, were installed in the course of the line's construction.

Trains of the Chicago Rapid Transit Company, which, under the terms of a lease, have been operating for more than a year over a completed portion of the Skokie Valley line as far as Niles Center, will continue in service.

Wage Issue in New Jersey

Public Service Railway Gives Views on New Agreement—Wants Old Wages

The wage issue affecting trainmen of the Public Service Railway, Newark, N. J., and its allied properties is up for consideration, with Amalgamated officials planning sessions in the near future on the course to be pursued. The agreement at present in effect between the association, the Public Service Railway, Public Service Railroad and the Public Service Transportation Company expires by limitation on Oct. 1, 1926. In the hope of reaching an amicable arrangement the company, through M. R. Boylan, vice-president in charge of operation, on June 1 made a public statement of its position in the matter.

He first referred to the present agreement, involving an increase in wages, which upon the former operating basis, it was estimated, would cost the Public Service Railway some \$2,000,000 a year. It was evident, he said, that the revenue available under the fare in effect at the time would not absorb this additional cost, especially under the conditions of bus competition then existing. Mr. Boylan said this fact was recognized by the State Board of Public Utility Commissioners, which, after careful consideration, suggested that the Public Service Railway put into effect a 5-cent fare good for a ride within the limits of the larger cities, with an additional 5-cent fare for rides in adjacent suburban territory, no transfer to be issued. This rate of fare was substantially that charged by buses.

The utility commission at the same time stated that it would regulate bus competition in accordance with the law and would endeavor to secure the co-operation of the municipalities to the same end. It also declared in favor of a modification of the company's paving obligation. Under these conditions the company accepted the suggestion of the board and put the 5-cent fare into effect, and has since extended it to cover all of its lines. The company realized that only by the greatest economy and efficiency of operation could the revenue received be expected to be sufficient to pay expenses.

According to Mr. Boylan's statement, as far as the company's operations are concerned the result aimed at has been in part, achieved. One-man operation, which offered the maximum rate wage to every operator, was put in effect and efficiency and economy of operation have been to a certain extent attained.

In speaking of the company's losses, Mr. Boylan said that in order to reduce bus competition the Public Service Transportation Company between Oct. 1, 1923, and Jan. 1, 1926, raised and expended for buses new capital to the amount of approximately \$11,430,000 and will during the present year raise and expend an additional \$6,345,000, or a total of \$17,775,000. He said every effort had been made to secure the co-operation of public authorities to the end that bus and car service be co-ordinated and the waste inherent in duplicate and useless service be eliminated and it has appealed to the public and to the state Legislature for the

removal of unfair and unjust paving charges. While considerable progress has been made in securing the co-operation sought, paving charges still remain a burden upon the company and co-ordination of car and bus service is far from being complete, so that, unfortunately, from every standpoint, the utmost efforts have failed to bring the cost of operating the three companies within the revenue which fares provide. In the 30-month period between Oct. 1, 1923, and April 1, 1926, the three companies together showed a loss for the period of \$3,534,217.

It is the opinion of the companies, Mr. Boylan said, that the situation can be corrected by complete co-ordination of street car and bus facilities and relief from paving obligations, combined with a return to the rate of wages in effect prior to Aug. 1, 1923, and still greater co-operation from employees.

Westchester Argument to Take Place on June 11

The appeal of creditors of the Westchester Street Railroad, White Plains, N. Y., to enjoin Leverett S. Miller, the receiver, from discontinuing service on the trolley lines until the property is sold will be argued before the Appellate Division in Brooklyn on June 11. The court announced on June 2 that in the meantime the stay would be operative. The announcement was made later that trolley service would be maintained in White Plains, Scarsdale and Tarrytown for the next several days until arrangements are completed for the operation of buses by the County Transportation Company, a subsidiary of the New York, New Haven & Hartford Railroad, which has just obtained franchise rights covering extensive bus routes in Westchester County. Announcement was also made that the Westchester Street Railroad would continue to operate its cars. The reason assigned was lack of substitute transportation facilities.

The sale of the property of the Westchester Street Railroad was ordered in mortgage foreclosure proceedings brought by the Farmers' Loan & Trust Company of Manhattan, as trustee for the holders of bonds amounting to \$225,000, which are long overdue. When Justice Morschauser granted an order permitting the receiver to discontinue operations on May 31 the creditors at once applied to the Appellate Division in Brooklyn for a restraining order. They maintained that to stop the operation of cars would damage the property and injure their interests.

The result of recent developments is that bus operation across Westchester County will be established as soon as the necessary consents have been received by the County Transportation Company from municipalities along the Sound shore. It will mean that the New Haven Railroad has a virtual monopoly of intra-county transit facilities in Westchester.

L. S. Miller, receiver of the Westchester Street Railroad, is president of the New York, Westchester & Boston and also of the County Transportation Company, which has obtained the bus franchise.

Louisville Advertises Its Need

The Louisville Railway, Louisville, Ky., recently published in local newspapers six letters, one each day, telling of its needs. This advertisement followed a letter to Mayor A. A. Will, advising him of the intended publicity work. The company is anxious to secure a franchise which will permit it to expand and enlarge its operations, not possible under the present grant with its maximum rate of 7 cents.

During the week the Louisville Real Estate Board adopted resolutions calling for a new ordinance for the railway with no fare limitation. The real estate men are handicapped in suburban development on account of lack of street railway facilities.

Seeks Eight Cents in St. Louis

Receiver Wells of the United Railways, St. Louis, Mo., on June 3 applied to the Missouri Public Service Commission to increase immediately car fares to 8 cents, two tokens for 15 cents, stating that the company under the present 7-cent fare was unable to earn a fair return on valuation. No change was sought in children's fare of 3 cents. Mayor Miller stated that the city would oppose the increase, but that the service-at-cost franchise now being negotiated would be presented to the public in three weeks. Federal Judge Paris authorized the application for an increase, which would net the company about \$1,200,000 annually. Hearing on the application was not set.

I.C.C. Schedules Hearings

The hearing assigned by the Interstate Commerce Commission on the application of section 15-a of the interstate commerce act to the Hudson Valley Railway of Glens Falls, N. Y., originally set for June 1, has been postponed until Aug. 3. The hearing on the Grand Rapids, Grand Haven & Muskegon Railway has been set for June 15.

Section 15-a of the transportation act of 1920 excludes from its provisions all railways not engaged in the general transportation of freight. It has been the contention of the American Electric Railway Association that under this provision a great many interurban electric railways which transport freight incidentally but are not operated as part of a general steam railroad system should be included in this exemption and therefore are not bound by the terms of the act. This view has been accepted by the Interstate Commerce Commission, which has agreed to consider the case of different roads individually and decide whether any such road comes under provisions of the act.

Under this ruling two hearings have been conducted. The first, held last December, was that of the Lackawanna & Wyoming Valley Railroad, in which the commission decided that on the records presented the road came under the provisions of the act. But it said, "Future changes in the traffic or operation of the carrier may justify a change in its classification." The other hearing so far held was on May 25 and was of the Interstate Public Service Company of Indianapolis. No decision in this case has been handed down yet.

Denver Does Some Boosting

It Isn't a City Without Electric Street Cars—It's a Better City with a Real Good Street Car System

Folks in Denver, Col., are inclined to agree with the caution of this article and to say: "Well, we must have one of the better cities because we have electric cars operated under a system that is incomparable, when its good qualifications are considered."

As he stood at the "Loop" and watched the various cars wind around, a representative of the JOURNAL smiled his approval when he saw on the front dashboard a large sign which read:

BUY A HOME IN DENVER
It's a Great Place to Live.

Why the sign; what the object? Well, the tourist season is beginning. Every day brings hundreds of visitors to the mile-high city and everybody wants a home. Many want a new home, a new place to live, and here is the silent salesman, a homy welcome, an invitation, a declaration that a great place to live is right in Denver. Words like these convince the citizens and the newcomer because they see the declaration flashed every few moments when the electric cars glide by smoothly.

Isn't this the work of some realtors?

No, indeed. It was suggested by W. G. Simmonds, purchasing agent of the tramway, and the directors took to it like a duck does to water. General Manager Robertson said:

We feel that it is part of our duty to do anything we can to build up our already beautiful city. There has been a wonderful growth in the last few years, both in number and quality; there is much room for more and the way to get it is to go after it, and that is just what we are doing.

We shall carry these signs for an indefinite period; that is, we have placed no limit during the summer season, but we will change the wording of the cards.

There are more than a hundred slogans. We expect to change the cards twice a week, and it may be that we will vary the exhibit, that is, not place them in a numerical row and use them in order, but placard in line with the day's events.

On all the posters the words "It's a Great Place to Live" will be used. President Ernest Stenger said:

First we are going to educate permanent residents and then we are going to devote our space to the thousands of tourists who will be visitors in the city between June 1 and Sept. 1.

Summing it all up one is forced to conclude that the tramway is doing for the city more than any other method, hence various improvement associations, the realtors, the city fathers are calling in person, via the telephone and by the use of the mails, to say to President Stenger and Vice-President Robertson:

Oh boy, but you folks have hit upon a wonderful educative idea. Our sincere thanks, appreciation and obligations are yours. As advertisers you may go to the head of the class.

One man upon leaving Mr. Robertson said:

Never again will I accuse you folks of being nickel nurses.

The V.-P. grinned. Try it in your own city, for be it ever so humble there's no place like home.

Oh, yes, here's one more slogan:

A good thing to remember and a better thing to do is work with the construction gang and not the wrecking crew.

Labor Wants Say in St. Louis Franchise

Action of the local Amalgamated union at St. Louis, Mo., in demanding certain concessions in the new United Railways franchise being drafted by city officials was indorsed by the Missouri Federation of Labor at Jefferson City on May 26.

The carmen want official recognition in the franchise of their right to organize, the right of a six-day work week, the right to have differences with the company arbitrated and a provision against the use of one-man cars in congested districts.

While not expressly advocating that members of organized labor should oppose a franchise that does not contain such provisions, the resolution adopted by the state labor convention calls upon

labor men to support any fair and reasonable franchise ordinance containing the provisions listed.

International Railway Seeks Loan for Reconstruction

Bernard J. Yungbluth, president of the International Railway, Buffalo, has suggested that the Buffalo City Council loan the railway \$750,000 with which to proceed with reconstruction of its Seneca Street line from the city line to Main Street. The railway points out that the city has \$5,170,000 in cash on deposit in Buffalo banks and the loan could be made without impairing the city's financial reserve. When the suggestion of the International Railway went before the City Council the city law department ruled that such a loan would be illegal and no formal action was taken. The city law department informed the Council that the company now owed the city \$8,000 for paving between the tracks in Main Street some years ago and no effort had ever been made by the company to reimburse the city. The Council ordered the corporation counsel to bring suit against the International to recover the \$8,000.

Formal notice has been served on the city by the railway that it is without funds with which to proceed with the rehabilitation of its tracks in several streets which were recently ordered by the Public Service Commission. The railway will appeal to the Appellate Division of the Supreme Court in an effort to have the decision of the state utilities board reversed.

Street Railway Commissioner at Des Moines Attacked

Charges that Mayor Fred Hunter and Councilmen John Jenney and Mrs. C. H. Morris planned in a secret meeting with J. Ben Wiley, secretary of the local street car men's union, to oust Col. Harry E. Wilkins, city street car supervisor, have been made by W. F. Mitchell, commissioner of streets.

In a public statement Mr. Mitchell declared that Mayor Hunter admitted that Mr. Wiley had made charges against Mr. Wilkins. The Mayor later said an investigation would be made.

Mr. Wiley admitted that he had charged Wilkins with being in too strong accord with railway officials, and that Mr. Wilkins, so far as the record shows, had never "gone to bat" with company officials over the rights of the public he is supposed to protect.

Under the terms of the franchise, the city supervisor has equal authority with the company's supervisor in the matter of determining proper service. Mr. Mitchell, who appointed Mr. Wilkins, declared that the fact that the supervisor lives in harmony with car officials is no indication that he is not looking after the rights of the public.

Mr. Mitchell further complicated matters by declaring that if Mr. Wilkins is ousted by the Mayor and Councilmen Jenney and Morris he will be promptly reappointed to the office. Mr. Mitchell said that under the terms of the franchise the nomination of the city car supervisor rests with the head of the Department of Streets.



Emphasizing the Value of Denver as a Place of Residence

New Agreement Submitted at Providence

Amalgamated officials submitted a draft of a new wage and working agreement to the officials of the United Electric Railways, Providence, R. I., on May 17 to replace the agreement which is now in effect, though theoretically expiring on May 31. To date no progress has been made as to acceptance of the compact.

The present rate of pay for motormen and conductors is 56 cents for the first three months of their employment, 59 cents for the next nine months and 61 cents after they have been employed one year. The new agreement asks 61, 65 and 70 cents for corresponding periods, an increase of 5, 6 and 9 cents an hour. The present pay of one-man car operators is 6 cents more than is paid motormen and conductors in two-man crews, and the new agreement asks that this be increased to 10 cents. The same differential is asked for motormen and conductors while acting as instructors and for bus drivers. Nine cents increase is requested in all of the mechanical and miscellaneous departments and for car starters, inspectors, money counters, checkers and clerks. In the freight department the agreement asks for 2 cents an hour more for motormen and conductors than is paid in the passenger department and 10 cents an hour more for the crew of the electric engine than is paid to the freight car crews.

The agreement calls for a general increase in all departments of the service, the institution of the 48-hour week, where it can be arranged without impairing the service to the public, and a slight rearrangement of runs so that at least 50 per cent of the scheduled runs shall be eight hours straight, two-thirds of the rest not to exceed eleven hours outside time, the remaining runs not to exceed thirteen hours outside time, and a guarantee of eight hours per day to all regularly employed motormen and conductors.

The relations between the company and the union are not changed, the company being asked to agree that there shall be no discrimination against employees because of their membership in the union and the union agrees that there shall be none on its part against new employees who refuse to join the union. Employees who are now or may later become members of the union, however, must remain members in good standing during the period of the employment.

Seniority rights in promotion in the different departments are asked in all cases when the senior employee of the department is able to qualify for the higher position.

Expiring Franchises at San Francisco Cause Comment

A scheme has been put before the Supervisors of San Francisco, Cal., to meet the emergency that will arise in the near future when the principal franchises of the Market Street Railway expire. Briefly, this plan proposes that the city turn over the municipal lines to the corporation for operation on a partnership basis, instead of wrestling with the difficulties of extend-

ing the municipal system over all the existing lines.

The situation is complicated. The franchises do not all expire at one time. In some instances the franchises overlap, so that disconnected portions of the system will expire at widely separated intervals. To take over operation of some routes the city would have to acquire the franchises on those portions where they were unexpired. The company owns the tracks, cars and equipment. To operate the lines the city would have to acquire the tracks and cars or replace tracks and cars with new ones. Naturally this situation has provoked considerable editorial comment. For instance the *Chronicle* said recently:

The common sense procedure at this time is to get at the facts. We need a transportation commission, whose members are not in politics and not affiliated with Market Street Railway interests, to study the situation and recommend such measures as it can formulate to deal with the case. Then the best method can be selected. Can nothing be done to awaken our public officials to the desperate need for prompt action in creating such a commission?

Wage Increase at Cleveland Accepted

The board of directors of the Cleveland Railway, Cleveland, Ohio, at a meeting on May 27 approved the wage increase to trainmen and all other employees. This is an increase which was ordered on April 27, the day following the City Council's approval of the amendments to the Tayler franchise. The bulletin concerning this increase follows:

Effective on May 1, 1926, and until further notice, the wage scale for motormen and conductors will be:

	Cents per Hour
First three months of service.....	65
Next nine months of service.....	68
Thereafter	70

All working conditions will remain unchanged. These are specifically those stated in notices of May 6 and June 22, 1925.

Part of the train force are members of Division 268 of the Amalgamated Association. After the bulletin on the wage increase was posted members of Division 268 met and considered the effect of the company's announcement, and a committee was appointed by them to discuss it. On May 17 the street railway company issued the following bulletin:

To Motormen and Conductors, All Lines:

In considering with representatives of you who are members of Division 268 the working conditions bulletined you on April 27, we have agreed that the general manager will meet these representatives semi-weekly and the president semi-monthly.

Members of Division 268 voted by ballot at the fourteen operating stations of the company on the question of accepting the increase or attempting to secure amendments to the Tayler grant by referendum. The vote to accept the increase was approximately three to one.

Company officials estimate that the increase will add approximately \$700,000 to the annual expenses. They are of the opinion that the present rate of fare will produce an income sufficient to care for the increase, but their ideas probably will be expressed in greater detail after June 6.

\$80,000,000 Electric Interurban Under Discussion

Engineers of the Atchison, Topeka & Santa Fé Railroad, it is said, have selected stations along a proposed route for an electric railway line between Bakersfield and Los Angeles at a cost of approximately \$80,000,000. Present plans call for the construction within the near future. W. R. White, local agent of the Santa Fé, verified the statement that surveys for the electric interurban line have been made. The line would be approximately 101 miles in length. Rumors have it that joint committees of both the Santa Fé and Southern Pacific companies are considering such a project.

Michigan Elevated May Construct Monorail in Detroit

Following a meeting attended by Mayor John W. Smith of Detroit, G. Ogden Ellis, president of the Street Railway Commission, and H. U. Wallace, general manager of the Detroit Municipal System, it was announced that the Street Railway Commission is agreeable to the proposal that the Michigan Elevated Railway be granted permission to erect a half mile or a mile of its overhead monorail rapid transit system in Detroit at its own expense. It is understood that the granting of this permission will not bind the city in any way with respect to the overhead monorail system, and that the experimental line is to be removed without expense to the city whenever such action is desired by the city.

The recent conference at which the decision was reached grew out of the fact that a letter to the City Council was referred by the Council to the commission. The opinion was expressed that no one should be interfered with in efforts to solve the problem. Action by the Council is awaited.

Another Franchise Drafted in Chicago

Although its present franchise has a number of years to run, a new ordinance for the Chicago Rapid Transit Company, operating elevated lines, was completed on June 1 by Corporation Counsel Busch. It will be submitted to the committee on local transportation of the City Council at an early date.

Like the surface lines ordinance which was recently approved by the committee, the measure is a tentative draft and subject to change. The outstanding feature of the elevated ordinance is that it provides for unification of the elevated and surface lines. There is no law which compels the elevated to submit to such an arrangement.

That the new ordinances will not be acceptable to either the Chicago Surface Lines or the Chicago Rapid Transit Company is regarded as a foregone conclusion by Mr. Busch. Speaking before the Chicago Association of Commerce on June 3, the attorney declared that both ordinances are dependent upon the enactment of state legislation that will permit the municipality to issue terminable permits and to regulate the utilities to which they are issued.

Winnipeg Difficulties Before Board

The Dominion government has appointed a board of conciliation to inquire into the dispute between the Winnipeg Electric Company, Winnipeg, Man., and its street railway employees. The one big union unit had applied for such a board because the company had refused to negotiate an agreement. When the agreement expired on April 30 the company took the stand that it would not negotiate an agreement with any body of men whose affairs were controlled or whose actions were influenced by the one big union, a communistic organization, which had somehow gained control of the committee representing the men following the signing of an agreement with the Amalgamated in 1922.

More details of the quarrel were given in the *ELECTRIC RAILWAY JOURNAL*, issue of May 22, 1925, page 898.

P.R.T.-Public Service to Run Delaware Bridge Buses

The Philadelphia Rapid Transit Company-Public Service Railway proposal for the operation of buses on the Delaware River Bridge, guaranteeing a minimum annual return to the Bridge Commission of \$100,000, will be recommended for approval by the commission at its next meeting.

The two transportation companies of Philadelphia and Camden will operate as the Penn-Jersey Transportation Company. Their offer made on May 28 to the transportation committee of the Joint Bridge Commission carries with it an agreement to pay 40 cents for double-deck buses and 25 cents for single-deck vehicles crossing the span. The bridge is fast being rushed to completion. It probably will be opened within the next few weeks.

Sunday Passes in Des Moines

The Des Moines City Railway, Des Moines, Iowa, has received permission from the City Council to institute a special 25-cent ticket for Sundays only, beginning on June 6. Tickets will be sold on the cars and will be good for an unlimited number of rides. They will be transferable and may be used any number of times by one person up to midnight.

F. C. Chambers, president of the company, said the plan will be tried for 60 or 90 days as an experiment. He said:

We want more riders. It is often claimed that a greater number would ride the cars if the cost were less. If low fares stimulate riding, this experiment should make that fact obvious. The holder of the special Sunday ticket may have any rate of fare he desires merely by taking more rides.

Hearing Set to Discuss Sale of New York City Car Lines

An invitation was extended on June 3 by the Board of Estimate of New York City, N. Y., to every street car and trolley company operating in New York City to appear before the board at a public hearing on June 22 to initiate proceedings looking toward the sale of

their property upon equitable terms to the city.

The actual resolution was that which was presented a week ago by former Comptroller Charles L. Craig and defeated through the negative votes of Comptroller Berry and President Julius Miller of Manhattan. It provided that a date be set for a public hearing to determine whether the Fourth and Madison and also the Eighth Avenue trolley lines constituted an "obstruction to traffic and an ill use of the street." The resolution was adopted on June 3 unanimously with an amendment that similar applications on the part of all other street car companies would be taken up at the same time.

I. C. Electrification at Chicago Nearly Completed

So rapid is the progress being made on the electrification of the Illinois Central Railroad's Chicago terminal that predictions made months ago that the first electric trains would be running by July 1 of this year will probably be definitely verified.

The first suburban trains to be changed over from steam to electric propulsion, according to an announcement by President C. H. Markham, will begin operation early in July between Randolph and 67th Streets. Construction forces have been increased until approximately 4,000 men are now employed in outdoor work on the terminal, in addition to large engineering and clerical staffs in the company's offices.

All overhead steel structures, involving the placing of 4,300 tons of steel, have been erected. The stringing of 293 miles of transmission wires and more than 100 miles of contact wire has already been completed. The company has tested 37 two-car units, while 60 more are soon to be tried out. Other equipment is set for early delivery.

Two car inspection plants, costing \$650,000, will be completed by the middle of June. Temporary suburban station facilities are almost ready for use.

News Notes

Submitting Names in Worcester.—The contest is on until June 15 in Worcester, Mass., for a suitable name for the new monthly pamphlet issued by the Worcester Consolidated Street Railway. The name of the new publication together with the winner of the \$10 prize will be announced in July.

Ride Free in Greensboro.—Meyer's department store in Greensboro, N. C., chartered all the cars and buses of the North Carolina Public Service Company for one hour on May 11, giving the residents of the city an opportunity to ride to the city free of charge. The store's annual anniversary sale began on that date.

Automatic Windshield Wipers for Indiana Cars.—Representatives of about twenty electric railways in Indiana who gathered on May 28 for a conference with members of the Public Service Commission at the statehouse agreed that within 90 days they would comply

with a request from the commission to install automatic windshield wipers on all of their cars.

New Magazine in Toronto.—The Toronto Transportation Commission, Toronto, Canada, is publishing a new house organ, called the *Coupler*. A commentator states that among its leading opinions is the difference between a coach and a bus—4 cents and a transfer.

\$7,226 as Paving Share.—After deducting a claim of \$577 against the Madison Railways, Madison, Wis., the finance committee of the Council voted to recommend that the company pay \$7,226 to the city as its share of the cost of repaving and repairing the streets on which its lines operate.

Improves Properties at Resorts.—The Connecticut Company has awarded a contract to the H. Wales Lines Company, Meriden, Conn., for remodeling its pavilion at Lake Quassapaug, Middlebury. The improvement is in line with a general revamping of the company's properties at popular resorts.

Wage Settlement in Pottsville.—Employees of the East Penn Electric Company, Pottsville, Pa., won a partial victory on May 26 when the award of arbitrators was made known, ending the dispute which has been in progress since the beginning of this year. Wages of 61 cents an hour for operators of two-man cars and 67½ cents an hour for operators of one-man runs were allowed. On the question of paying the men for time engaged in eating, which was one of the chief objections of the company to the present schedule, a compromise was agreed upon. On the two-man cars there is no provision for pay, but this is retained on the one-man cars.

Illicit Use of Transfers.—"Bootlegging transfers" is the newest form of sport on the Seattle Municipal Railway, Seattle, Wash., and has resulted in the arrest of two men caught in an attempt to use a street car transfer not issued to them. E. A. Mitchell, public utilities traffic inspector, saw the men accept the transfer from two others. "Transfer bootlegging," Mr. Mitchell declares, robs the railway of large sums of money every year. He declares that members of the "transfer ring" get the slips, which they do not need, and dispose of them for small sums to regular "fences" at transfer points. The men arrested will be tried under the ordinance making it a misdemeanor to defraud by illegal use of a transfer.

No Fare Reduction for Des Moines in Sight.—If increases in the stabilizing fund of the Des Moines City Railway, Des Moines, Iowa, continue as they have the last seven months it will be three years before patrons can expect a reduction in fares. This situation was indicated in the April report for the company. The fund is now only \$12,500, an increase of \$4,176 in April and about the normal rate since the 10-cent fare became effective in October. The fund must reach \$150,000 before the reduction is possible. The report shows 2,031,502 passengers carried in April and revenue of \$190,395, while total revenue for the month was \$198,690. Operating expenses, depreciation and taxes were \$156,435.

Honor for Transit Man.—Frank L. Raschig, chief engineer of the Rapid Transit Commission of Cincinnati, Ohio, has been elected president of the Cincinnati Chapter of the American Society of Civil Engineers. For the past four years Mr. Raschig served as vice-president of the organization.

Foreign News

Buenos Aires Tramways Makes Report

Result of the operation of the tramway lines in Buenos Aires, Argentine Republic, which city has a population of 2,000,000 inhabitants, for the year of 1925 compared to 1924, is as follows:

Gross earnings:	1925	1924
Anglo-Argentine, surface..	\$18,279,280	\$18,321,600
Anglo-Argentine, subway..	2,368,889	2,287,360
Laeroze Company.....	3,307,960	3,243,160
Tranvias Electricas del Sud	129,440	124,240
Port and city of Buenos Aires.....	343,640	365,760

German Tramcar Accidents

Causes of accidents and the means of their reduction are dealt with at some length by A. Wolf in a recent issue of *Verkehrstechnik*. Taking as a basis the traffic accidents in Germany from 1899-1919, the figures relating to tramways show that 43.77 per cent of the accidents were sustained by passengers and 56.23 per cent by pedestrians. Of the total, only 8.38 per cent were due to tramway operation. The majority of passenger accidents were caused by boarding or alighting moving cars, sudden application of the brakes, and collisions. Folding steps and gates on the rear platforms would, he believes, reduce accidents due to the first cause.

Transportation in Chile.—Transportation facilities are on the up-grade in Chile. Valparaiso and San Antonio, rival seaport cities, are both connected with the inland metropolis and capital of the state, Santiago, by electric railway lines, the latter city having an advantage of proximity to the capital by a shorter railway haul. However, in Valparaiso an excellent tramway system serves the traveling public, and marked improvement has been shown since the city authorities have had the streets straightened and paved. Funicular railways are used also, to carry the pedestrians from the lower street levels of Valparaiso to the higher ones, because of the abruptly rising hills. Buses, too, will be in more demand and used to a greater extent because of the automobile highway, nearing completion, which will cover these routes.

English Company to Be Bought.—The City Council of Worcester, England, has decided to purchase the tramway of the Worcester Electric Traction Company. It is hoped that this will be done by agreement with the company at a price of about £60,000, so that the cost of an arbitration may be avoided. The Council has introduced a bill before Parliament to give it authority to work the tramways.

Recent Bus Developments

Ordinance Would Provide Tax for Bus Companies

The City Council of Buffalo, N. Y., has directed the city law department to draft an ordinance requiring all bus companies engaged in passenger transportation over city streets to pay the city a percentage of their annual receipts to provide funds for the upkeep of pavements on streets over which the buses operate. In the event that the city law department rules such an ordinance illegal, the Council indicated it would amend all existing bus franchises to provide for the payment of the tax.

According to Commissioner Frank C. Perkins, the large double-deck buses operated by the International Bus Corporation, a subsidiary of the International Railway, Buffalo, are destroying the pavement of the streets over which they operate. Buses have been forced to alter their routes to avoid pavements condemned by the city engineering department. Property owners along several parkways and streets told the municipal authorities that the buses alone have been responsible for the damage done to the pavements. Due to the damage, the Council has voted to repave several streets over which buses operate and one-half the cost will be paid from the general fund of the city and the balance will be assessed against abutting property owners.

Members of the City Council believe the International Bus Corporation should be required to pay a special tax which would be sufficient to guarantee part of the maintenance of these streets. The company's application for a rehearing before the commission on this order has been denied. B. J. Yungbluth, president of the International, says the company has no funds with which to make the improvements.

Substitution of heavy pneumatic tires for solid rubber tires on all double-deck buses of the International Bus Corporation was proposed by the City Council as a means for reducing the damage being done to the city pavements.

Cross-Town Service in Des Moines —No Independent Bid

The Des Moines City Railway, Des Moines, Iowa, has put in crosstown service three new 25-passenger buses of latest design. They have a White engine and chassis upon which is mounted a body built by the Bender company of Cleveland.

Officials of the Capital City Motor Coach Company, who announced several months ago that they would ask the City Council for a franchise to operate here, have made no public request as yet for a permit to operate, although the new Council took office the first week in April.

M. H. Cohen, attorney for the company and a stockholder, said he has interviewed individual members of the Council and expects soon to ask for a permit. In some quarters, however, the

continued delay on the part of the bus company executives is interpreted to mean that Mr. Cohen has been unable to secure the promise of enough votes to put the Council on record for buses.

Seeks to Restrain Line

The Amalgamated Association has filed a bill in equity in the Supreme Court at Boston, Mass., to prevent Franklin T. Miller, receiver for the Boston & Worcester Street Railway, from operating a bus line between Boston and Worcester. It is stated that the agreement between the railway and the union provides that at the introduction of a new method of transportation, the matter of the status of the employees would be settled by a conference between members of the union and officials of the company. The operation of buses instead of street cars is a new method of transportation on the route between Boston and Worcester by the railway and, according to the union, becomes subject to discussion under the agreement. It is further brought out that such transportation jeopardizes positions now held by members of the association, and the union proposes to protect its members.

Rules on Standees, Hours and Brakes in Massachusetts

Rules have been adopted by the Massachusetts Department of Public Utilities to cover the number of passengers to be permitted to stand in buses, to govern the number of hours employees are to be permitted to work and to fix the equipment of brakes that shall be provided. On the question of the limitation of the number of standees the commission said:

Passengers in excess of 25 per cent above the seating capacity of the motor vehicle shall not habitually be carried. Where the number of passengers regularly applying for transportation exceeds that above provided for, it shall be the duty of the licensee to furnish additional facilities to carry such passengers.

In no event shall standing passengers be carried a distance in excess of 15 miles. The use of portable seats for passengers on any motor vehicle shall not be allowed.

On the hours of service of operators the regulations read:

No owner of a bus shall cause or allow any operator to work as such for more than ten hours in any period of sixteen consecutive hours, except in cases of emergency.

On the question of brakes the commission said:

Every bus shall be provided with at least two brakes, powerful in action and separated from each other, of which one brake shall act directly on the driving wheels or on parts of the mechanism which are firmly connected with said wheels. The service or foot brake shall suffice alone to stop the bus within a distance of 45 ft., and the emergency or hand brake shall suffice alone to stop the bus within a distance of 100 ft. when the vehicle is moving at a speed of 20 m.p.h., on a dry level road. One of the two brakes shall be so arranged as to be operated by the foot. One shall be a ratchet brake which can be set when the operator leaves the bus. Brakes shall at all times meet with the requirements of any tests made by the department, its representatives or other authorized persons.

Seattle Bus Purchase Still Uncertain

Protests by organized labor have failed to shake the City Council of Seattle, Wash., in its determination, reached more than a year ago, to replace with a municipal bus line the privately-owned buses operating on Tenth Avenue Northeast. But the Council is still unable to agree as to how the fourteen buses shall be purchased, although the \$80,000 for their purchase was appropriated months ago. A proposition is now before the Council utilities committee, sponsored by two Councilmen, providing for appropriating \$55,000 to purchase fourteen chassis of designated makes, with an understanding that the bodies were to be built by the municipal railway in its shops. Other members of the Council think that bids should be called for the buses complete, while a minority think that bids should be called separately for bodies and chassis.

The Central Labor Council meanwhile has appealed to the Council, urging that the F. M. Peterson bus line, which for years has furnished service on Tenth Avenue Northeast, be permitted to continue operation. They base their claim on the allegation that patrons prefer the privately-owned bus line to a municipal line, and that under municipal ownership the bus line, operated by the municipal railway department, would add to the annual deficit from the city's various bus lines. The Council feels, however, that since the city is in the transportation business, it should have a monopoly of that business. It is also pointed out that from the 10-cent fare collected, the bus line gets 7½ cents and the municipal railway only 2½ cents, although the haul on the car lines is much longer than that on the buses.

Bus Bids in New York to Be Considered June 14

Probability of any award of bus franchises in New York City before July 1 was diminished on June 1, when the Board of Estimate postponed consideration of several applications until June 14, the date of the last stated meeting of the board before the summer vacation. All these applications were for individual routes instead of for the so-called bus systems, proposed by the Board of Transportation.

Hornell to Have Buses July 1

Buses will supplant trolleys in Hornell, N. Y., after July, when the Hornell Traction Company will suspend operations after years of service at a deficit. The Hornell Council has granted the application of Raymond E. Page, receiver for the railway, for a fifteen-year franchise to operate buses in place of the electric railway that has served the city for 35 years. Virtually the same service as maintained by the trolleys will be kept by the buses. Mr. Page stated that about \$50,000 would be invested for equipment for the new bus line and that the trolleys would be kept running until the buses arrive. Application also will be made by Mr. Page for permission to operate buses between

Hornell and the neighboring city of Canisteo to replace the present inter-urban railway.

Stockholders in the Hornell Traction Company will receive nothing and bondholders about 10 cents on the dollar when the affairs of the company are wound up. There is about \$120,000 in stock outstanding and \$150,000 in bonds, on which about \$25,000 in interest is due. The system had been in receivership for some time.

Hearing on Illinois Bus Project Deferred

The petition of the Western Motor Coach Company, recently organized by Britton I. Budd, president of various Insull electric railway properties, which was scheduled for hearing on May 26 before the Illinois Commerce Commission, was deferred until June 15. The Western Motor Coach Company has applied for a certificate of convenience and necessity to operate buses on four main routes out of Chicago, following in general the line of the Chicago, Aurora & Elgin Railroad and supplementing that service. It will operate as far as Aurora, Geneva and other points in the Fox River Valley. This project was referred to previously in the ELECTRIC RAILWAY JOURNAL.

Trolleys Replaced in Winfield.—Railway service in Winfield, Kan., supplied by the Arkansas City-Winfield Northern Railway was abandoned on May 25. Buses will replace the railway line. The bus fare is 8 cents with two tickets for 15 cents, against the railway rate of 7 cents.

Buses Supplant Cars.—Electric railway service will be discontinued in Phenix City, Ala., following permission by the Alabama Public Service Commission. Buses will be substituted to be operated by the Columbus Electric & Power Company. The railway line in Phenix City is owned and operated by the Columbus Electric & Power Company, which company owns and operates the railway lines in Columbus, Ga., just across the Chattahoochee River from Phenix City. The company gave as its reason for discontinuance the fact that the cars no longer paid.

Seeks to Buy Bus Competitor.—The Cincinnati, Lawrenceburg & Aurora Electric Street Railroad, which operates between Cincinnati and the Indiana state line, has asked the Ohio State Public Utilities Commission for authority to purchase the certificate of the Indiana Bus Company. The bus company is a competitor of the inter-urban.

How the Buses Are "Panning Out."—The Chicago & Joliet Transportation Company, operating buses in the Joliet, Ill., district, recently opened a newspaper campaign to inform customers of the results of bus operation. April figures were printed showing a loss of \$1,756, not including charges of interest on investment, depreciation or reserve. Operating revenue was \$5,804 and expenses \$7,560. There were 66,133 passengers, with an average revenue of 8.8 cents, carried at a cost of 11.4 cents. Coach-miles were computed at 28,850, with the revenue 20 cents a

coach-mile and the expense 26.2 cents. The company explains its publication of the figures in this wise: "Motor coach patrons will be interested to know how the line which operates in their vicinity is 'panning out.'"

Supreme Court to Pass on Holyoke Issue.—The Interstate Buses Corporation of Connecticut has taken its appeal to the Supreme Court at Washington in its fight against the Holyoke Street Railway, Holyoke, Mass., which recently obtained an order from the Massachusetts courts restraining the bus company from operating buses in unfair competition with the street cars. The Supreme Court refused to grant a temporary order to allow the buses to continue operations, but has consented to hear the case, which is scheduled for Oct. 4.

Seeks Permission for Bus Line.—The International Railway, Buffalo, N. Y., has filed a petition with the City Council for permission to operate a passenger bus line in Walden Avenue from Bailey Avenue to the easterly city line. The petition says the company desires to operate the Walden Avenue bus line in conjunction with the proposed Best-North Street line, for which a petition for a franchise is now pending in the Council.

Buses Will Replace Car Line.—The Michigan Electric Railway recently notified the City Commission of Owosso and the Corunna City Council that it would abandon service in and between the two towns and tear up its rails. The company said the line had been a losing venture and that it could no longer comply with the requirements of its franchise. Bus service will be substituted for the street cars. The buses will be operated by the Owosso-Flint Bus Line, Inc., an Owosso, Mich., company.

Permits Secured for Bus Operation.—Having obtained all necessary local licenses and state certificates, the New England Transportation Company, subsidiary of the New York, New Haven & Hartford Railroad, has started a bus line connecting Boston, Walpole, Wrentham, North Attleboro, Pawtucket and Providence. The company has opened a terminal at 36 Park Square, Boston. Coincident with the through operation between Providence and Boston, shuttle service between Boston and Wrentham was put in operation. The buses are driven by operators formerly employed by the New York, New Haven & Hartford Railroad. Regular railroad fare tickets are honored on the buses.

Seeks to Substitute Buses.—The Madison Railways, Madison, Wis., has applied to the Wisconsin Railroad Commission for permission to abandon its tracks on Harrison Street and to operate buses from Regent Street to the west city limits. Residents will be furnished service at more frequent intervals. The city of Madison plans to pave Harrison Street this year. It will be necessary for the railway, if it continues its old route, to share in the paving costs. The company plans ultimately to double track Regent Street to the west city limits and abandon Harrison Street, so that the officials do not see the justice in asking the company to pay for paving its share of a street that it will soon abandon.

Financial and Corporate

Traffic in Capital Stabilized

Washington Company Believes Downward Trend Over—Large Sums Spent for Maintenance

For the year ended Dec. 31, 1925, the balance of income of the Washington Railway & Electric Company, Washington, D. C., credited to profit and loss was \$404,226. To this was added other miscellaneous items, making the total credited to profit and loss during the year \$644,857. This figure compares with \$258,035 for the year 1924. The financial situation of the company was made the subject of the report of President Ham at the annual meeting held on Jan. 16.

During the year 1925 the company's system carried 101,829,572 passengers, of whom 24,323,936 were carried on transfers, leaving 77,505,636 revenue passengers. This indicates a decrease in revenue passengers of 281,039, or only about one-third of 1 per cent, compared with the revenue passengers carried during the year 1924. This is a relatively small decrease compared with that suffered annually since 1919, indicated in the accompanying table.

STATEMENT OF PASSENGERS CARRIED BY WASHINGTON RAILWAY & ELECTRIC COMPANY

	Revenue Passengers Carried	Decrease Compared With Previous Year
1919	91,488,735	
1920	87,782,784	3,705,951
1921	85,481,656	2,301,128
1922	82,716,756	2,764,900
1923	81,518,607	1,198,149
1924	77,786,675	3,731,932
1925	77,505,636	281,039

Although the operations of the company and its subsidiary railway companies with the present fare of 8 cents cash, or tickets at the rate of six for 40 cents, indicate a return of less than 4 per cent on the value of the property within the District of Columbia, fixed by the Public Utilities Commission, the company continued in 1925 the practice of recent years of expending large sums of money on track renewals and repairs. Maintenance of way and structures, together with allowances for depreciation, totaled \$981,792. The more important projects completed in 1925 were the renewal of rails and substructure on 1.69 miles of underground construction and renewal of rail and paving on practically 7½ miles of overhead construction, which projects alone cost \$469,681. With respect to the rolling stock of the company, two snow sweepers and 24 buses were added during the year at a cost of \$177,897.

On the safety contest started in 1921 and continued during 1925 the report says the constant increase in the use of automobiles was a most important factor. Due to this, and to the unusually inclement weather the early part of 1925, that year was one of the most difficult, from the standpoint of safety in operations. These conditions brought

about a slight increase in the number of accidents occurring in 1925 compared with the previous year. It is noted that 74 per cent of all accidents were with automobiles. Efforts of the company to draw the attention of the public to the need of care in all street movements, through posters and otherwise, aided in keeping the accidents down. The expenditures for settlements of claims was but 2.76 per cent of total operating revenues for the year.

The total outstanding bonded indebtedness of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, is now \$26,282,900, which, added to the \$15,000,000 capital stock of the parent company, and \$2,093,750 outstanding capital stock of subsidiary companies, makes the total outstanding capitalization Dec. 31, 1925, \$43,376,650. This excludes bonds purchased for the sinking funds and for temporary investment.

The total payroll for 1925 of the Washington Railway & Electric Company and subsidiary companies, including the Potomac Electric Power Company, was \$4,659,090, an increase over the previous year of \$377,843. The number of employees in the service of the company's system as of Dec. 31, 1925, was 2,979.

The figures for 1925 in the accompanying comparative table are subject to revision upon final audit.

COMPARATIVE STATEMENT OF WASHINGTON RAILWAY & ELECTRIC COMPANY

	1925	1924
Gross earnings from operation	\$4,775,285	\$4,759,243
Miscellaneous income (including dividends from Potomac Electric Power Company)	1,025,501	858,802
Gross income	\$5,800,785	\$5,618,045
Operating expenses (including depreciation), taxes and miscellaneous charges	\$3,915,959	\$3,820,621
Interest on funded and unfunded debt	730,600	790,675
Payment of dividend on 5 per cent preferred stock	425,000	425,000
Payment of dividend on common stock	325,000	325,000
	\$5,396,559	\$5,361,297
Balance of income for year 1925, credited to profit and loss	\$404,227	\$256,748
Miscellaneous items credited to profit and loss	240,630	1,287
Total credited to profit and loss during the year	\$644,857	\$258,035

In discussing the use of the bus by the company President Ham said:

The additional buses acquired now bring the total available for operation, as auxiliaries to our street car service, to 44. During 1925 we augmented the rail service by inaugurating four new bus lines. Upon completion of the highway from Bladensburg School to East Riverdale, Maryland, in August, 1925, we extended the bus operations of the Washington-Interurban Railroad to East Riverdale, thereby completely abandoning rail operations on this line.

All of our bus service is operated in coordination with rail service and, while operated at a direct loss, has added materially to the convenience of the public. We realize that through the use of buses new avenues of traffic may be opened up, thereby extending a wider use of all transportation facilities. We are constantly studying the needs of additional bus transportation and since Jan. 1, 1926, have placed in service a new bus line, known as the Rhode Island Avenue Coach Line, operating between Fourth Street and Central Avenue, Northeast, to Nineteenth and "H" Streets, Northwest.

U. S. District Court Must Decide Seattle Tax Issue

The suit of the Old Colony Trust Company against the city of Seattle, Wash., which involved taxes charged against the street railway and light and power properties of the Puget Sound Power & Light Company in 1919, was not a suit against the state of Washington but against alleged harmful acts of agents of the state and hence properly could have been brought in a federal court. The Supreme Court decided this issue on June 1, reversing the decree of the district court which had dismissed the bill for lack of jurisdiction on the ground that it was a suit against the state. The effect of the decision, rendered for the court by Justice Van Devanter, is to send the case back to the United States District Court of Washington for trial.

Early in 1919, the Puget Sound company owned and operated both the street railway system and the electric light and power system of Seattle. It transferred the street railway system to the municipality in March that year under a contract which specified that state, county and municipal taxes should be borne proportionately for the year. The city later refused to pay any part of the taxes against the properties, the bill for the year having been rendered and charged against the company prior to the transfer of the street railway properties. The county treasurer threatened to proceed against the electric light and power system for the full amount of the taxes charged to both systems for the full year. The Old Colony Trust Company filed suit to stop proceedings by distraint and sale, acting as trustee for a mortgage issue of bonds on the light and power system issued in 1921. The tax bill aggregated \$400,000, of which \$179,000 was for municipal taxes. Under the contract for transfer of the street railway, three-fourths of the taxes were to have been charged to the municipality.

Decreased Earnings in Ottawa

The Ottawa Traction Company, Ottawa, Canada, received from the Ottawa Electric Railway during 1925 \$279,075, with which were paid the usual quarterly dividends of 1 per cent and a bonus of 1 per cent. This fact was disclosed in the twelfth annual report of the Ottawa Traction Company for the year ended Dec. 31, 1925. The report itemized the work done during the year in modernizing the plant.

President T. Ahearn in his address to the stockholders said he regretted that the report was not so good as the shareholders were accustomed to receive in that it showed a substantial decrease in gross earnings compared

with 1924. He stated that in carrying out the terms of its new contract with the city the company had spent a very large amount in improving and extending the system, but that the second year of the contract had just been completed and the results for both the first and second years were much less favorable than those forecast in the report of the city's expert. In this connection he called attention to the possibility of an application for increased fares at the end of the current five-year period. He reiterated the policy of the company to maintain the 5-cent fare in Ottawa if possible and expressed the hope that improved business conditions would enable that policy to be continued.

One of the causes for decreased receipts, he pointed out, was from the operation of buses to and from points outside the city limits. The inroads being made by this competition, if unchecked, would in itself result in increased street car fares. The manager had recently brought the matter to the attention of the Board of Control.

Balance in Oakland \$284,194

The passenger revenue of the Key System Transit Company, Oakland, Cal., for the year 1925 decreased \$26,694 compared with 1924. The number of passengers carried increased 808,852. The decrease in revenue and increase in passengers carried are explained by the additional passengers taking advantage of the commuter rates, which are lower than regular rates and free transfers. Transportation expenses increased \$97,715. The increase of \$74,419 in transportation and power expenses added to the decrease of \$26,694 in passenger revenue resulted in a net loss of \$101,114.

These facts are contained in the annual report of the company for the year ended Dec. 31. C. O. G. Miller, president, stated that as the earnings of the company continued to be satisfactory from the standpoint of operation and the bondholders, they are still inadequate to yield a fair return to the stockholders on their investment and give a fair return on the value of the property devoted to public service.

STATISTICS OF THE KEY SYSTEM TRANSIT

For the Year Ended Dec. 31, 1925

Passengers carried:	
Traction division:	
Cash and ticket fares, 6 cents.....	73,491,050
School tickets, 3 cents.....	1,987,617
Commuters (East Bay cities).....	617,613
Miscellaneous, 12 cents, 18 cents, etc	1,189,953
Total revenue passengers.....	77,286,233
Free transfer passengers.....	21,568,238
Total revenue and transfer passengers.....	98,854,471
Key division:	
Transbay fares, 18 cents.....	8,724,479
Commuters, transbay.....	8,037,406
Children's fares, 10 cents.....	212,678
San Francisco-Sacramento Railroad tickets.....	237,033
Miscellaneous transbay tickets.....	33,259
Total transbay passengers.....	17,244,855
Fares (East Bay cities), 6 cents.....	531,768
School tickets, 3 cents.....	43,488
Total passengers (East Bay cities)	575,256
Total revenue passengers, key division.....	17,820,111
Entire system:	
Revenue passengers.....	95,106,344
Revenue and free transfer passengers.....	116,674,582

The company provided additional service to the extent of 207,476 passenger-car-miles and 506,349 bus-miles. The motor coach service performed by the company at regular street car rates with free transfer privileges is resulting in a net annual loss of approximately \$124,000. Net additions to the company in 1925 totaled \$355,244. The year was marked by important reconstruction work and the purchase of new equipment. As a result of arbitration proceedings between the company and the platform men, an award of the eight-hour day with increased pay an hour was put into execution at the beginning of the new year.

The costs and revenues from Key System bus operations were as follows: Bus-miles in 1925, 850,111; 1924, 340,479; receipts in 1925, \$82,076; 1924, \$24,145; drivers' wages in 1925, \$49,376; 1924, \$20,278; other direct costs in 1925, \$114,103; 1924, \$43,274; state gross receipts tax in 1925, \$4,308; 1924, \$1,266; overhead in 1925, \$29,522; 1924, \$11,698; interest on investment in 1925, \$9,004; 1924, \$4,082; total cost in 1925, \$206,315; 1924, \$80,601; net loss in 1925, \$124,238; 1924, \$56,456; passengers carried in 1925, 2,261,739; 1924, 703,641.

Rockford Bonds Must Be Deposited by June 15

Robert W. Baird, chairman of a committee representing the owners of the 5 per cent first mortgage gold bonds of the Rockford & Interurban Railway, Rockford, Ill., announced on May 27 that the committee had fixed June 15 as the limit of time in which bonds might be deposited under the protective committee agreement. The formation of the protective committee of bond-

holders really dates back to Nov. 1, 1925. Subsequent to the formation of the committee approximately \$1,000,000 of bonds was deposited with the committee. The committee then deposited \$365,000 of the deposited bonds with the Continental & Commercial Trust & Savings Bank of Chicago, as trustee under the deed of trust securing the Rockford & Interurban bonds and pursuant to the provisions of the deed of trust requested the trustee to institute foreclosure proceedings. Upon receipt of this request the trustee applied for the appointment of a receiver and on Feb. 15, 1926, Adam Gschwindt was appointed receiver of the properties of the Rockford & Interurban Railway and the Rockford City Traction Company, security for the Rockford & Interurban bonds. The receiver is now operating the properties covered by the trust deed.

\$1,663,698 Loaned to City by Detroit Municipal Railway

During April the Department of Street Railways loaned the city of Detroit, Mich., \$1,663,698 on demand notes of the city bearing interest at 4 per cent. William M. Hauser, auditor, made this fact public in presenting the financial statement of the department for the month. This money was loaned out of the various funds of the department as follows:

Sinking fund	\$413,698
Interest fund	450,000
Injuries and damages fund.....	800,000
Total	\$1,663,698

The Department of Street Railways would receive only 3 1/2 per cent on this money if it were left on deposit in the banks, while the city of Detroit would be compelled to pay 4.10 per cent to 4.25 per cent if it had borrowed from the banks. Mr. Hauser regards this arrangement as beneficial to both the general taxpayer and the car rider.

The auditor further pointed out that in the report for March, 1926, attention was drawn to the fact that the department had \$49,612 available for future capital costs. The amount available for future capital costs at April 30, 1926, is \$196,503. In other words, the Department of Street Railways' investment has been brought back to the position where it shows an equivalent in property and equipment for all the money that was put into it, and a surplus of \$196,503, an amount by which current assets are in excess of its current debt.

The outstanding bonds, including the Detroit United Railway obligation at April 3, 1926, are given as \$37,131,000. There is accumulated in the sinking funds, consisting of cash and securities, \$6,059,600 at April 30, 1926, toward paying this debt, so that the net debt remaining to be paid is \$31,071,099. The department has an investment in road and equipment of \$44,456,472, on which \$31,071,099 remains to be paid. The difference between these two amounts, \$13,385,373, represents the equity of the city of Detroit in its transportation facilities, and the amount that has been contributed by the car riders toward establishing a city asset represented by its railway system.

The balance of net income for April,

INCOME ACCOUNT OF THE KEY SYSTEM TRANSIT COMPANY

For the Year Ended Dec. 31, 1925

Gross operating revenue.....		\$7,289,871
Operating expenses:		
Way and structures.....	\$439,349	
Equipment.....	564,310	
Power.....	668,642	
Conducting transportation..	2,873,807	
Traffic expenses.....	21,334	
General and miscellaneous..	679,293	
Transportation for investment and construction overhead (credit).....	67,542	5,179,194
Net operating revenue.....		\$2,110,676
Less taxes.....		444,032
Operating income.....		\$1,666,644
*Add-non-operating income.....		211,560
Gross profit.....		1,878,204
Sundry charges:		
Depreciation.....	\$689,035	
Amortization of franchises..	8,762	
Abandonment of obsolete equipment.....	1,395	699,193
Balance, current operations.....		\$1,179,011
Deductions:		
Bond interest.....	\$789,757	
Other interest.....	12,502	
Miscellaneous.....	22,636	824,896
Surplus, current operations.....		\$354,114
Profit and loss adjustments.....		35,490
Surplus.....		\$389,604
Surplus from prior year.....		308,207
Total surplus.....		\$697,811
Less four quarterly prior preferred dividends paid.....		413,617
Balance to surplus account.....		\$284,194

*Includes \$126,408 net revenue, Key System Service Company.

1926, is \$74,587 after the payment of sinking fund charges. The balance of net income for the month of April, 1925, was \$74,360, so that the past month shows an increase of \$226 over that for April, 1925.

During April, 1926, 43,665,806 passengers were carried by the rail lines and 1,745,087 by the coach lines, a total of 45,410,893 passengers, compared with a total of 40,858,694 in April, 1925, divided 40,190,694 rail lines and 668,231 coach lines. In other words, the department carried 4,551,968 passengers, or 11.1 per cent more in April, 1926, than in April, 1925.

Net Income Improves in Buffalo.—

For the three months ended March 31, 1926, the operating revenue of the International Railway, Buffalo, N. Y., was \$2,709,594, compared with \$2,568,482 for a similar period in 1925. Operating expenses and taxes decreased from \$2,342,858 in 1925 to \$2,283,271 in 1926. The 1925 expense figure was adjusted to include 3 cents an hour additional wage paid on Dec. 31, 1925, and retroactive to Jan. 1, 1925. The net income after the consideration of income deductions was \$64,298 for the three months period to March 31, 1926, against a deficit of \$149,741 for the three months period ended March 31, 1925.

Net Income Higher.—For the four months period ended April 30, 1926, the railway operating revenue of the Eastern Massachusetts Street Railway, Boston, Mass., was \$3,335,607, against \$3,274,637 for a similar period last year. The operating expenses fell from \$1,971,149 to \$1,941,691. The net corporate income carried to profit and loss is \$344,092 for the four months period of 1926, compared to \$299,821 for the four months period ended April 30, 1925.

Increase Scope of Service.—The British Columbia Electric Railway, Vancouver, B. C., has acquired the plant of the New Westminster Gas Company and will in future supply this commodity to the residents of the Royal City. The transaction marks the passing of one of New Westminster's early industries, although the plant will continue to be operated and will be improved. The gas works has about 12 miles of mains in New Westminster. A few years ago a plebiscite was submitted to the ratepayers for the purchase of the industry. The proposal carried, but the scheme never reached fruition.

Passenger Travel in Memphis Increases.—During the present year the number of passengers on the lines of the Memphis Street Railway, Memphis, Tenn., has been consistently increasing over the corresponding months of 1925. The increased riding, however, has not been sudden, as is indicated in a comparison of the months of December, November and October, 1925, with similar months of the previous year. The *Tri-Service News*, the official paper of the Memphis Power & Light Company, says the increase indicates that people are more and more acknowledging the street car as the most economical as well as safest and most convenient means of transporta-

tion in regular travel. Although the number of passengers has shown a considerable decrease over a period of about four years, the company hopes now that the tide has turned and that an improvement may be shown indicating larger patronage to the cars.

Applies to Abandon Two Branches.—The Cleveland Southwestern Railway & Light Company, Cleveland, Ohio, has filed application with the Ohio Public Utilities Commission for permission to abandon the Amherst and Grafton branches of its railway. The Grafton branch runs from Elyria, Ohio, to Grafton and the Amherst branch from Penfield Junction to Amherst. The company claims these branches are being operated at a loss.

Toronto Loses Interest Appeal.—The city of Toronto lost its appeal in the first divisional court at Osgoode Hall in its effort to collect interest on the \$500,000 deposited into court during the arbitration proceedings between the city of Toronto, Ont., and the Toronto Street Railway. The city of Toronto appealed against the decision of Mr. Justice Grant, who decided against the city's action to recover interest on the \$500,000. The city appealed to the first divisional court at Osgoode Hall, and five separate judgments were delivered by their lordships on the bench. While separate judgments are being given, Chief Justice Mulock, Mr. Justice Hodgins, Mr. Justice Smith and Mr. Justice Ferguson all decided that the appeal should be dismissed.

Bids for Property on June 17.—The Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., has been granted permission by the Public Service Commission to abandon its lines and sell its property. The railway operates about 22 miles of line in the towns of Exeter, Hampton, Hampton Falls and Seabrook, N. H. Bids on this property will be receivable at once and acceptance of the highest bid or

bids will be made on June 17 for the whole or any part of the equipment and rails. Bids must specify whether the offering party intends to junk the line or continue railway operation.

April an Encouraging Month.—For the first time this year the Oklahoma Railway, Oklahoma City, Okla., in April made more than enough money to pay its operating expenses, its taxes and its interest charges, according to the monthly report of W. C. Jones, auditor. There was a balance of \$625 after paying expenses, the report shows. Increased freight revenues are helping to reduce the company's deficit, officials pointed out. The company is now making special efforts further to increase its revenues through freight service with the hope of being relieved from receivership as soon as possible.

Net Income Increases in Baltimore.—The net income of the United Railways & Electric Company, Baltimore, Md., during April of this year totaled \$81,049, compared with \$65,964 for April, 1925. For the first four months of this year the net income after fixed charges was \$281,708 an increase of \$63,340. Gross revenue in April was \$1,421,965, compared with \$1,414,058 for April of last year. Gross revenues for the first four months this year were \$5,579,622 or \$50,686 more than for the first four months of 1925. The operating expenses totaled \$846,249, a decrease of \$10,662.

Four-Mile Line to Suspend.—The Missouri Public Service Commission has authorized the Grand View Railroad, a 4-mile electric railway between the southern city limits of St. Louis and the Alpha Portland Cement Company's plant on the Lemay Ferry Road in St. Louis County, to discontinue and abandon the line. The property will be junked. The company reported an annual net deficit of \$1,200 in 1924 and 1925 despite a subsidy of \$3,000 from the cement company. This bonus was stopped on Jan. 1, last.

Book Reviews

Electric Railway Practices in 1925

A summary of the most significant features of presentations by electric railways to the Charles A. Coffin Foundation; edited by Henry H. Norris with an introduction by John N. Shannahan. American Electric Railway Association, New York. 233 pages, exclusive of appendices and index.

This volume is uniform with similar volumes published in 1924 and 1925. It places on record in detail the practices and methods of most general interest followed by the electric railways which competed last year for the Charles A. Coffin prize. The volume, like the others in the series, is well arranged and indexed. The chapter headings selected are twelve in number as follows: Furnishing Better Transportation Service; Improved Operating Practices; Getting Closer to the Public; Selling the Service; Advertising as an Aid in Selling Service; Recent Types of Cars and Buses; Improved Operating Practices; Recent Maintenance Methods; Improving Electric Railway Construction; Securing the Co-operation of Employees;

Bettering the Accident Record; Electric Railway Financing.

The material presented in last year's briefs is of unusual value. While it was abstracted at length in the technical press shortly after the award, the reappearance of the material in book form in greater detail, with the information carefully collated and grouped under subject heads, gives another use for it.

As the Coffin competition for electric railways has more than established its value in stimulating interest in improvement, it might be worth while to consider somewhat more definitely than has been done in the past the fields being filled by this book and another with a somewhat similar name, also published by the association, namely, "Handbook of Modern Electric Railway Methods and Practices, 1925." If the latter is to be issued annually in the future, it might be well to see whether the titles could not be differentiated more than at present or the material combined in a single annual volume.

Legal Notes

CALIFORNIA—Leased Trucks Held to Be Common Carriers.

Some truck owners leased their trucks to shippers at a certain daily rate, but with such other provisions as to the rate that the Public Service Commission held they were common carriers. As such, they came under the Auto Stage and Truck Act, which requires certain duties of such carriers. This contention of the Railroad Commission was upheld in spite of the fact that the trucks were not operating between fixed termini and over regular routes. [Holmes et al. vs. Railroad Commission et al., 242 Pacific Rep., 486.]

CONNECTICUT—Duty to Passenger in Perilous Position.

The plaintiff was standing on the running board of a moving trolley car and was struck by a standing truck. In confirming the verdict for the defendant, the Supreme Court of Errors defined the duty of a railway to its passengers by quoting from the decision of the trial court, which said, in part: "A railway is not an insurer of passengers' safety, but must use the utmost care to avoid injury to such passengers that a reasonably prudent person would use under such circumstances." [Dwyer vs. Connecticut Co., 131 Atlantic Rep., 838.]

FEDERAL CIRCUIT COURT—Contract of Street Railway to Pay Half of Cost of Maintaining Gates at Steam Railroad Crossing Has Consideration.

A contract, by which a street railway company agreed to pay a steam railroad one-half of the cost of maintaining gates at the intersection of their tracks, will not be voided on the plea that the contract lacked mutuality or was without consideration. [Northern Ohio T. & L. Co. vs. Erie R.R., 8 Federal (2d) 962.]

FEDERAL CIRCUIT COURT—That Private Interests Were Benefited or That They Defrayed Expenses of Relocating Highway Held Not to Affect Validity of Condemnation Under Right of Eminent Domain.

A railway agreed with county authorities to donate certain land for a new highway and to build a large power station at a certain point if the authorities would abandon a portion of the old highway which obstructed the construction of the power station. The agreement was carried out, but the owner of some real estate which was condemned by the county commissioners brought suit on the ground that the change in location was dictated because of the benefit to private interests and so was a violation of the fifth and fourteenth amendments of the Federal Constitution. The Circuit Court of Appeals of the Sixth Circuit held, however, that the mere fact that private interests were served or that they defrayed in whole or in part the expenses of the relocation of the highway or

other improvements would not affect the validity of the proceedings, and in this case the change in location was justified from the public interest. [Weaver vs. Pennsylvania-Ohio P. & L. Co., 10 Federal (2d), 759.]

FEDERAL DISTRICT COURT—Intra-state Business of Interstate Bus Company Prohibited.

Greenfield, Mass., contended that it could do an intra-state business in Massachusetts without complying with the provision of the Massachusetts statute for the regulation of motor buses, but this was forbidden by the Federal District Court of Massachusetts. [Holyoke Street Railway vs. Interstate Buses Corporation, et al., 11 Federal (2d.), 161.]

FEDERAL SUPREME COURT—Delay in Ending Confiscatory Rates May Constitute Confiscation.

In a case where a public service commission did nothing for two years to increase telephone rates after the Federal Circuit Court had reversed an earlier order of the commission, the Supreme Court said that "property may be as effectively taken by long continued and unreasonable delay in putting an end to confiscatory rates as by an expressed affirmation of them." [Smith et al. vs. Illinois Bell Telephone Co., 46 Supreme Court Rep., 408.]

FEDERAL SUPREME COURT—Right of Interstate Railway to Abandon Unprofitable Intrastate Branch.

The Interstate Commerce Commission has power to authorize a railroad chartered by a state and engaged in both interstate and intrastate commerce to abandon a branch line located wholly within the state, when this line cannot be operated except at a loss. This authority arises from the power of Congress to free interstate commerce from unreasonable burdens. [State of Colorado vs. United States et al., 46 Supreme Court Rep., 452.]

FEDERAL SUPREME COURT—Reasonable Return and Excessive Depreciation.

A public utility company, which because of excessive depreciation in the past has created a reserve depreciation account greater than that required adequately to maintain its property, cannot be compelled to apply a part of the property or money represented by such reserve to overcome a deficit in present or future earnings or to charge low rates which otherwise could not be sustained. The just compensation, safeguarded to a utility by the Federal Constitution, is a reasonable return on the value of the property used at the time that it is being used for public service, and the protection does not depend on the source of the money used to purchase the property. Past losses cannot be used to support a claim that present or future rates are confiscatory, nor can profits of the past be used to sustain confiscatory rates for the future. [Board of Pub. Util. Com.

et al. vs. N. Y. Tel. Co. 46 Supreme Court Rep., 363.]

IOWA—Doors Opened Before Car Stopped.

As a car was approaching the destination of a passenger he stepped in front of the door and the conductor opened it, although the car was still moving. In attempting to alight, the passenger fell and was injured. The court gave an extended review of decisions in similar cases and concluded in this case that the question of contributory negligence was a matter for decision by the jury. [Fitzgerald vs. Des Moines City Railway, 207 Northwest. Rep., 602.]

KANSAS—Pedestrian Crossing Street Is Negligent if He Fails to Look for Car Approaching.

A pedestrian undertook to cross a street on which there were two car-tracks. He crossed the first safely, but while on the second track he was struck by a street car, which required 60 ft. to stop and which, as he stepped on the second track, was 30 ft. away and coming toward him at the rate of 20 m.p.h. His failure to look out for the approaching car was held to be negligent, as a matter of law, precluding a recovery. The fact that his attention was attracted to a car approaching from the opposite direction on the other track did not affect the case. [Ogden vs. Wilson et al., 243 Pacific Rep., 284.]

NEW JERSEY—Injury to Alighting Passenger When Car Started without Warning After Unscheduled Stop.

A car stopped at an unscheduled point because the road was temporarily obstructed by a truck that had been backed up against the curb. Several passengers got off. Then the defendant attempted to do so as it was near her destination, but as she was attempting to alight, the car was started, and she was injured. The question of the motorman's negligence is a proper one for settlement by the jury. [Scott vs. Atlantic City & S. Ry., 132 Atlantic Rep., 239.]

NEW YORK—Motormen and Conductors May Be Examined by Plaintiff before Trial.

Within the Civil Practice Act, Sec. 289, which permits the examination of "officers, directors, managing agents, or employees" of a corporation before trial, where their testimony is material and necessary to the plaintiff's case, the motorman and conductor of a street car may be so examined. [Enequist vs. Brooklyn City R., 214 New York Sup., 450.]

SOUTH CAROLINA—Injury to Taxicab Attempting to Cross in Front of Two Cars.

A taxicab driver received a sign from the motorman of a trolley car on a city street to pass ahead of that car, but when he attempted to do so, he was struck by a trolley car coming in the opposite direction. The taxi driver was held negligent, but a judgment in favor of a passenger in the taxicab was affirmed, as there was some evidence of negligence by the railway. [Dozier vs. Charleston P. R. & L. Co., 131 Southeast. Rep., 592.]

Personal Items

J. P. Griffin Active Vice-President of Texas Road

Important changes are announced in the personnel of the Texas Electric Railway, Dallas, Tex. Burr Martin, vice-president and general manager, has resigned, effective July 1. James P. Griffin has been given the title of active vice-president in charge of all operations.

Mr. Martin's withdrawal is due to slightly impaired health and a desire to retire from active business. He plans an extended trip to the Pacific Coast. Mr. Martin has been with the company more than fifteen years.

Mr. Griffin went to Dallas in July, 1905, with J. F. Strickland as secretary of the Texas Traction Company, an association engaged in the effort to build an interurban railway from Dallas to Sherman. This project was successful, and that line was put in operation on July 1, 1908, and Mr. Griffin served as secretary, also as general passenger agent and auditor. On April 1, 1912, he became also secretary of the Southern Traction Company, then building the interurban lines from Dallas to Waco and Dallas to Corsicana. These lines were put in operation in October, 1913. Mr. Griffin also served as general passenger agent for these lines.

On Jan. 1, 1917, the Texas Traction Company and Southern Traction Company were consolidated under the name of the Texas Electric Railway, and Mr. Griffin was elected secretary and general passenger agent of that company. On June 19, 1923, he was elected vice-president of the Texas Electric Railway.

Mr. Griffin was born at Waxahachie, Tex., on Jan. 28, 1881. He was graduated from the high school at Waxahachie in 1900 and took special work at the University of Texas in 1903. His first railway experience was in the general freight and passenger office at Waxahachie of a subsidiary of the Southern Pacific. He served in the General Land office of the State of Texas at Austin, Tex., from 1902 to 1904, and was secretary to Jack Beall, now president of the Texas Electric Railway, for one year while he was in Congress.

H. I. Gahagan has resigned as treasurer. This vacancy may be filled at the meeting to be held June 15.

A. J. Bush has resigned as local manager at Waco.

J. G. Hailey has resigned as electrical construction engineer, and he will be succeeded on July 1 by G. H. Peters as superintendent of power.

J. A. Wright has resigned as auditor. He will be succeeded by D. W. Milam, Jr.

M. R. Fewell will succeed Mr. Griffin as general passenger agent.

C. F. McAuliff, who is now purchasing agent, will have added the duties of chief clerk in the operating department.

H. G. Floyd will continue as superintendent of the Southern Divisions,

Dallas to Waco and Dallas to Corsicana, being in charge of transportation, line and roadway. M. J. Loftus will continue as superintendent in charge of the Dallas-Denison Division, with duties similar to those of Mr. Floyd.

J. F. Layng and J. M. Stoddard on Missouri Road

John F. Layng, vice-president of the Buchanan & Layng Corporation, New York, has assumed the title of general manager for Receiver M. H. McLean of the Joplin & Pittsburg Railway, Joplin, Mo. As announced in the *ELECTRIC RAILWAY JOURNAL* for April 24, page 738, the Buchanan & Layng Corporation is making a report on the affairs of the railway, with the management of the road placed in the firm's hands. Mr. Layng temporarily assumes the title of general manager for the receiver during the period required to make the report and determine a plan of reorganization. As its resident representative on the ground the engineering firm has appointed J. M. Stoddard to the post of assistant general manager in charge of local operations of the company. Mr. Stoddard was formerly for twelve years superintendent and assistant to the general manager of the Long Island Electric Railway and the New York & Long Island Traction Company, Jamaica, N. Y., and later was general manager of the former company.

F. H. Daniels Heads Riley Stoker Corporation

Fred H. Daniels, general manager of the Riley Stoker Corporation, has been elected president to fill the vacancy resulting from the death of R. Sanford Riley; Aldus C. Higgins, vice-president, has been elected chairman of the board of directors, and James W. Armour, engineering manager, has been elected a member of the board of directors. The officers of the company are now as follows: President, Fred H. Daniels, Worcester, Mass.; vice-presidents, Aldus C. Higgins, Worcester, Mass.; William Pestell, Worcester, Mass.; R. T. Riley, Winnipeg, Manitoba; S. A. Armstrong, Toronto, Ontario; and secretary and treasurer, David K. Beach, Worcester, Mass. The board of directors of the company now consists of Fred H. Daniels, Aldus C. Higgins, William Pestell, David K. Beach, George N. Jeppson, Charles L. Allen, Henry S. Pickands, and James W. Armour.

Since the organization of the company in 1911 Mr. Daniels has been closely associated with Mr. Riley in connection with its affairs, having served respectively as secretary, general manager and vice-president. The company announces that the same policies and principles which have resulted in the company's growth under the leadership of Mr. Riley will be continued.

C. B. Frazer Made Superintendent of Traffic at Houston

Carl B. Frazer was recently appointed superintendent of traffic of the Houston Electric Company, Houston, Tex., succeeding C. A. Brann, who was transferred to the El Paso Electric Company.

Mr. Frazer has had a varied experience in public utility work and has been connected with companies under the executive management of Stone & Webster, Inc., for eight years. His first assignment was with the Columbus Electric & Power Company at Columbus, Ga., where he was a salesman in the commercial department. After serving in that capacity for one year he entered the accounting department of the company. Later he went to Cuba. There he was connected with a light and water company for approximately one year, but returned to the Columbus company as chief clerk. He next was transferred to the home office of Stone & Webster at Boston, Mass. After serving for nine months in the treasurer's office of Stone & Webster, Mr. Frazer went to the Haverhill Gas Light Company at Haverhill, Mass., as assistant treasurer, whence he went to Houston.

F. A. Jordan Promoted at Atlanta

F. A. Jordan, purchasing agent for the Georgia Railway & Power Company, Atlanta, Ga., for the past three years, has been promoted to the position of supervisor for purchases and stores. These two departments, although their work is closely connected, had previously been operated separately.

Mr. Jordan is a veteran of twenty years service with the Georgia Railway & Power Company. He became a member of the street mains department of the Atlanta Gas Light Company in 1907. Later he was transferred to the stores and purchasing department of the same company, and upon the formation of the Georgia Railway & Power Company he was assigned to the purchasing department. He became purchasing agent for the Georgia company in 1923.

Obituary

Eliseur S. Goodrich, president of the Hartford Street Railway and of its predecessor, the Hartford & Wethersfield Horse Railway, Hartford, Conn., for some 40 years prior to 1906, died in Wethersfield, Conn., on June 1. He was 91 years old last December. For many years Mr. Goodrich was also president of the Hartford & New York Transportation Company, which operated a steamboat line between New York and Hartford, but he retired from active connection with both companies upon their purchase by the New York, New Haven & Hartford Railroad. He did not, however, give up his personal interest in electric railroading at that time, and he was a regular attendant of annual conventions of the American Electric Railway Association long after he was 80 years old.

Manufactures and the Markets

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

Business Conditions in May Improve Over 1925

Reports for the early weeks of May indicate increases in business activity as compared with the same weeks of 1925. Larger production of bituminous coal and beehive coke, larger awards for building construction, greater receipts of wheat and cotton, and a larger distribution of merchandise, as measured by car loadings, were reported during this period, compared with the corresponding weeks of 1925. Debits to individual bank accounts, indicative of the dollar volume of trade, were also running larger during the early weeks of May than a year ago. Wholesale prices continued to average lower than a year ago but the early weeks of May recorded an advance over the previous month. Business failures were running smaller in number than a year ago.

Loans and discounts of Federal Reserve member banks were declining in May, as compared with last month, but were well above last year. Prices of stocks averaged for the third week of May were higher than in the preceding week and a year ago. Call-loan rates for the same week were stronger than in any previous week during the month, being higher also than a year ago. Time-money rates showed the same comparison with the previous weeks and a year earlier, while the Federal Reserve ratio, averaged for the first three weeks, was higher than in the previous month but lower than a year ago. Loans on stocks and bonds to brokers and dealers by member banks in New York City continued to decline.

Six-Wheel to Exhibit Buses and Trucks

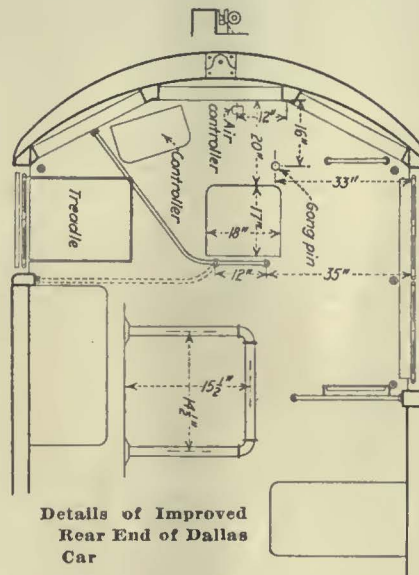
Exhibition of the new type parlor car body on the model 64 bus chassis will be made by the Safeway Six-Wheel Company of Philadelphia at the forthcoming convention of the Mechanical and Purchases and Stores Division of the American Railway Association at Atlantic City, June 9-16. New departures in the model 64 bus, which is designed either for high-class city or de luxe interurban touring service, are the street car type double jackknife folding front doors, arcade type of roof, permitting low appearance from the outside while allowing 75½ in. of headroom, and rear doors 31 in. on both sides. Five seats of the folding taxi type are installed at the rear. The right-hand rear door for baggage storage opens only to the outside. Balloon tires 38x9 are standard equipment.

In addition to the new bus model, the company has on exhibit its new model 57 truck chassis, suitable for city trucking service and particularly for long-distance operators, it is claimed. The Six-Wheel company believes that railways will become large

users of this new truck. It has shown a speed of from 25 to 40 m.p.h. without injury to pay-load or highway, it was stated.

Improved Rear Exits for Dallas Cars

The Dallas Railway, Dallas, Tex., has ordered 30 one-man, two-man modified Peter Witt type cars from the American Car Company, St. Louis, Mo. As a new feature the rear doors of these cars are



to be treadle operated, this being added to speed up unloading and consequently the operating time of the cars.

General specifications are as follows:

Number of cars ordered	30
Name of road	Dallas Railway
Date order was placed	May 8, 1926
Builder of car body	American Car Co., St. Louis, Mo.
Type of car	One-man-two-man
Length over all	45 ft. 8½ in.
Truck wheelbase	21 ft. 11½ in.
Width over posts	8 ft. 5 in.
Height, rail to trolley base	10 ft. 7½ in.
Body	All steel
Interior trim	Cherry, stained light
Roof	Arch
Air brakes	General Electric
Bumpers	Channels with flanges outward
Car signal system	Faraday buzzers
Car trimmings	Statuary bronze
Curtain fixtures	Curtain Supply
Curtain material	Curtain Supply, Wyndasote
Destination signs	Hunter No. 35
Door operating mechanism	National Pneumatic—rear doors treadle operated
Fare boxes	Johnson
Fenders	H. B. lifeguard
Heater equipment	Consolidated Car Heating double oil trussplank
Headlights	Golden Glow SM-95
Motors	Four GE-265, inside hung
Sanders, Nichols-Lintern materials	preferred
Sash	Curtain Supply all metal
Seats	Reversible backs
Seating material	Birch slats
Step treads	Feralun
Trolley catchers	Keystone
Trucks	Brill 177-E-1
Ventilators	Railway Utility honeycomb
Wheels	26 in. diameter
Energy saving device	Economy meters

Need for Relief from Unwise Transportation Legislation Stressed

Using the illustration of over-regulation of traffic and all forms of transportation by national, state and municipal governments to show the need for industrial freedom from unwise legislation, Frederick P. Fish, honorary chairman of the National Industrial Conference Board, pointed out the manner in which the board has striven to overcome this tendency during its past ten years of existence. His talk was given on the occasion of the tenth anniversary meeting of the board, held at the Hotel Astor, New York, on May 20. Mr. Fish was one of the original founders of the conference board and has acted as its chairman up to the present time. The address was in the nature of a review of the manner in which the board has functioned and the objective to which it has striven during its existence.

While stressing the point that industry as a whole and the transportation industry in particular must expect a certain amount of legislative control of the proper kind and must, in fact, welcome this supervision as conducive to its own best interest, nevertheless too great control or legislation which does not consider the welfare of the public as a whole and provide fair treatment to its transportation agencies must be discouraged. Mr. Fish pointed out that the present traffic situation is intolerable in the larger cities of the country and that conditions will inevitably become worse before some means of betterment is found. In this connection, he believes that the proper interpretation of all facts dealing with transportation in general is of utmost importance and should be stimulated by railway and other transportation officials.

Today industry is far less individualistic, according to Mr. Fish, and the relationships existing between employer and employee have undergone a profound change from those of a few years ago. Employers have come to realize that they do not profit in the long run by refusing to their employees a comfortable living wage. Mr. Fish stated that the labor unions are valuable institutions as long as their function is to remain on watch against unfair treatment of labor, unsatisfactory working conditions, etc. In this function, he

Metal, Coal and Material Prices

Metals—New York	June 1, 1926
Copper, electrolytic, cents per lb.	13.825
Copper wire, cents per lb.	16.00
Lead, cents per lb.	7.675
Zinc, cents per lb.	7.30
Tin, Straits, cents per lb.	60.25
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$4.675
Somerset mine run, Boston, net tons	2.00
Pittsburgh mine run, Pittsburgh, net tons	1.825
Franklin, Ill., screenings, Chicago, net tons	1.925
Central, Ill., screenings, Chicago, net tons	1.75
Kansas screenings, Kansas City, net tons	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	\$6.25
Weatherproof wire base, N. Y., cents per lb	18.00
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.	15.00
Turpentine (bbl. lots), N. Y., per gal.	\$0.87

believes that they are to be heartily co-operated with, but when they attempt to interfere with management, to restrain production and to endanger public welfare, Mr. Fish believes they should be strongly condemned.

The speaker suggested a comprehensive survey by some unprejudiced body or commission, examining into the very root and structure of industry throughout the country. In this way, with all sides playing fair, he believes that it will be possible to determine just what regulation is needed today. This study of industry should be made in the light of present conditions rather than those of 40 or 50 years ago, and the study should embrace not only business in general but transportation services as well. The speaker declared that the state legislatures and national government are recognizing the changed attitude which industry is taking in its relations with the public, the government and its employees, as well as its competitors. He pointed out that in former days the railroads and industry invited legislative attacks by the general attitude which they assumed. The attack was not slow in forthcoming and much damage was done to the general business structure before the uncompromising attitude which had caused the trouble was done away with.

The danger of a highly organized minority dominating an entire community was pointed out in connection with a reference to the recent coal strike and the often-threatened general railroad strike in this country. The experience which England has just gone through was cited to show that it is the duty of the American people to look forward and see what can be done to make impossible any such situation in this country.

Westinghouse Traction Appointments

T. J. Pace, director of sales for the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has announced the following appointments in the traction apparatus sales division of the company. In charge of the division is A. J. Manson, while in charge of the various types of traction sales are E. T. Wurts, heavy traction; E. A. Palmer, light traction; W. B. Bassett, propulsion; L. F. Brahmaer, line material; A. B. Gibson, renewal parts, and E. P. Gooth, cost.

Rolling Stock

Birmingham Electric Company, Birmingham, Ala., is following, in its sixteen new cars, very much the design of the previous order. The principal differences are that the new cars will have rubber tile floors, metal sash and plush upholstered seats. A brief reference to this latest order was published in the issue of May 22, page 910. Some of the principal specifications follow:

Date order was placed.....	May 20, 1926
Date of delivery.....	Four months
Builder of car body.....	Cincinnati Car Company
Type of car.....	Closed passenger motor
Seating capacity.....	60
Weight (total).....	35,000 lb.
Length over bumpers.....	49 ft. 7 in.
Length of body.....	48 ft. 7 in.

Width over all.....	8 ft.
Height, rail to trolley base.....	10 ft. 8 1/2 in.
Body.....	Side entrance
Interior trim.....	Cherry
Roof.....	Turtle back type
Air brakes.....	Westinghouse straight air
Axles.....	Treated steel
Bumpers.....	Cincinnati Car Company pressed steel
Buzzers.....	Electric Service Supplies Company
Car trimmings.....	Brass
Conduits.....	Duraduct
Control.....	K
Curtain fixtures.....	Curtain Supply Company
Curtain material.....	Pantasote
Destination signs.....	Hunter
Door-operating mechanism.....	National Pneumatic
Fenders.....	H. B. Hefguards
Gears and pinions.....	G. E., treated
Hand brakes.....	Cincinnati Car Company
Heaters.....	Consolidated
Headlights.....	Electric Service Supplies Company
Headlining.....	Agasote
Journal boxes.....	Cincinnati Car Company
Lightning arresters.....	G. E.
Motors.....	G. E. 265
Paint.....	Duco
Registers.....	International
Sanders.....	Ohio Brass
Sash fixtures.....	National Lock Washer
Seats.....	Hale & Kilburn
Seating material.....	Plush
Side and center bearings.....	Cincinnati
Slack adjusters.....	American
Springs.....	Cincinnati Car Company
Step treads.....	Feralun
Trolley catchers.....	Ohio Brass
Trolley base.....	U. S. 20-C
Trucks.....	Arch bar, Cincinnati
Ventilators.....	Railway Utility Company
Wheels.....	Chilled Iron, 26-in. diameter

Track and Line

Gary Railways, Gary, Ind., has started the reconstruction of a substantial part of the 15-mile interurban line between Gary and Valparaiso, Ind. The program calls for expenditures of approximately \$37,000. It includes the rebuilding of the Woodville Junction bridge and several small trestles, the erection of five new outdoor passenger shelters and the laying of 10,000 creosote-treated ties. The work of laying a second track on Eleventh Street in Gary will soon be undertaken. Double tracking of a section 3/4 mile long through Tolleston on the Gary-Hammond line was completed on May 28. In all reconstruction, the company is replacing the old 60-lb. rails with 90-lb. rails, installing creosote-treated ties and laying heavy gravel ballast.

Trade Notes

Edwin Besuden, for the past few months sales promotion manager for the Leon L. Wolfe Company, Cincinnati, Ohio, has severed his connections with that company. Most of Mr. Besuden's experience has been in the electric railway field. For more than eighteen years he was affiliated with the Jewett Car Company, Newark, Ohio, being sales manager twelve years of that time. Upon the retirement of this company from business he became associated with the Chicago Varnish Company as sales manager of its eastern territory, later acting in a similar capacity for the DuPont company after its purchase of the Chicago Varnish Company. While with the Leon L. Wolfe Company Mr. Besuden introduced Kemi-Suede, the new waterproof fabric manufactured by the Kemitex Products Company, Barberton, Ohio.

Taylor Electric Truck Company, Troy, N. Y., manufacturer of electric railway car trucks, railway car springs and

springs for heavy vehicles, announces the appointment of L. W. Rolfe as sales manager. Mr. Rolfe formerly served in the same capacity with the Simmonds Machine Company of Albany, N. Y.

Francis A. Fox, formerly of the Griffin Wheel Company and more lately of the Yellow Truck & Coach Manufacturing Company, has joined the organization of the Mack-International Motor Truck Corporation, with headquarters in Chicago. Mr. Fox will co-operate with the various branches of the central division of this company in the sale of buses and trucks to the public utility and railway companies. The central division comprises eighteen states in the Middle West.

Francis T. West, who has been Western manager of the Watson-Stillman Company, with headquarters in Chicago, Ill., for the past 25 years, has retired. He has been succeeded by J. F. Coyne with offices at 549 West Washington Boulevard, Chicago. Associated with Mr. Coyne in the handling of the hydraulic machinery and accessory lines of the Watson-Stillman Company are James T. Lee and John O. Clark.

Bridgeport Brass Company, Bridgeport, Conn. has announced that H. Allen Faust, 915 City Center Building, Philadelphia, who has been covering the state of Pennsylvania, including the Philadelphia district and southern New Jersey, as salesman of brass pipe and tubular plumbing goods, has had Maryland, West Virginia and Washington, D. C., added to his territory.

Dr. R. H. Cunningham, widely known electrical engineer, has joined the Eise-mann Magneto Corporation engineering staff. Dr. Cunningham has been identified with the automotive industry since its inception, except for a brief period 1917-1919, during which he occupied a post at Columbia University.

New Advertising Literature

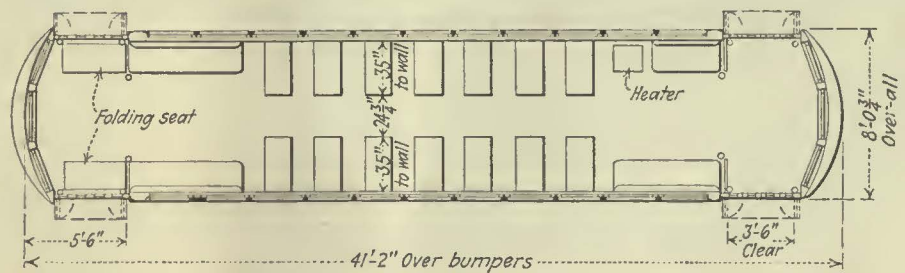
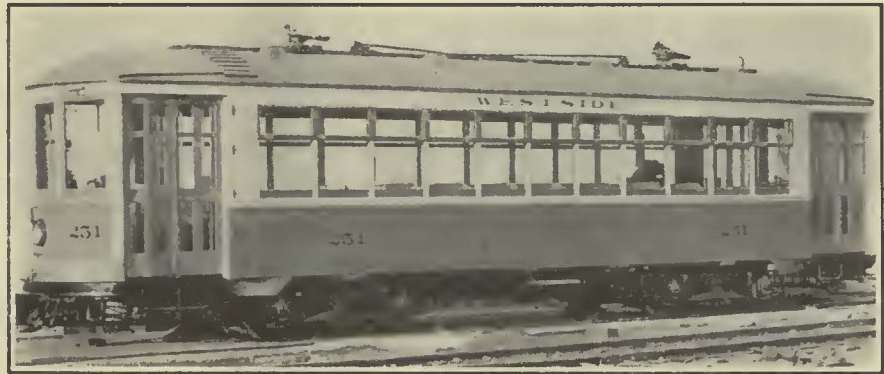
American Car & Foundry Motors Company, New York, N. Y., has issued a leaflet entitled "Across the United States Every Eighteen Minutes." It describes the large mileage and worldwide adoption of Fageol safety coaches, and the manner in which these buses are being developed in line with best transportation practice and thought.

American Abrasive Metals Company, New York, N. Y., has just issued a new leaflet illustrating and describing a new design of safety car step. The use of Feralun anti-slip treads in connection with various step designs pictured is recommended by the company.

Economy Electric Devices Company, Chicago, Ill., has issued a leaflet telling of the purchase of 375 Economy watt-hour meters by the Philadelphia Rural Transit Company, Philadelphia, Pa. An extract from a paper by R. M. Horton president of the Philadelphia Rural Transit Company, which was delivered before the Society of Automotive Engineers in November, 1925, is included.

Roller-Smith Company, New York, N. Y., has issued supplement to Bulletin No. 530 dated May, 1926, covering Roller-Smith direct-acting time-limit attachments for standard type circuit breakers.

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Engineers and Contractors SYRACUSE, N. Y.

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ENGINEERS

Operation and Management
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424 CHESTNUT STREET PHILADELPHIA

THE P. EDWARD WISH SERVICE

50 Church St.
NEW YORK

Street Railway Inspection
DETECTIVES

131 State St.
BOSTON

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

The Most Successful Men in the Electric Railway

Industry read the

ELECTRIC RAILWAY JOURNAL

Every Week

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 build. That's why so many electric railway men rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut



Gets Every Fare

**PEREY TURNSTILES
or PASSIMETERS**

Use them in your Prepayment Areas and
Street Cars

Perey Manufacturing Co., Inc.
101 Park Avenue, New York City

UNA

RAIL BONDS-RAIL JOINTS
DYNAMOTORS
WELDING ROD

UNA Welding & Bonding Co.
Cleveland, Ohio.



MOHAWKS

Go Farther!

A handsome tire—strong—clean-cut—well balanced appearance. It looks like a super quality tire—AND ACTS LIKE IT. Try them the next time. You won't regret it.

THE MOHAWK RUBBER COMPANY
AKRON, OHIO

Branches in Principal Cities
Export Dept. 745 West 55th Street, New York, N. Y.



“Low Tire Cost Per Mile”

“We felt that you would be interested in knowing of the very good service Firestone Tires have been giving us and the exceptional way your local dealer takes care of our needs.

“We very highly recommend Firestone Gum-Dipped Cords to any bus operator interested in low tire cost per mile.”

The endorsement of another Firestone enthusiast! For Firestone Bus Pneumatics permit maintenance of schedules at lowest cost per mile. They are built specially for bus loads at bus speeds. They deliver the mileage that means economy.

Gum-Dipping, the exclusive Firestone process, insulates every fiber of every cord with live rubber, minimizes internal friction and destructive heat. The broad tread and deep cushioning assure greater comfort for passengers and lessen strain of road vibration on engine and chassis.

You can profit by Firestone bus tire experience. Combine it with your dealer's knowledge of local conditions. See him next time you buy tires.

MOST MILES PER DOLLAR



Firestone

TRUCK AND BUS PNEUMATICS

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER .

Harvey Firestone

Light on the Bus Braking Question

The ABC's of Bus Brakes and Braking Systems

Self-Equalization and Brake Adjustments

For safe, effective braking it is absolutely necessary that wheels on the same axle receive equal braking power. On front wheels this is vital. A stronger drag on one side than on the other may easily spell disaster.

Perfect brake equalization depends primarily upon three major elements:—Friction between tires and road surface;—coefficient of friction between the brake shoes or bands and the drums;—and the pressure applied to the band or shoe. The first of these is governed by tire pressures and actual road surface conditions, and is largely under control of the operator.

The equalization of the coefficient of friction between two or more sets of brakes has been difficult to obtain and maintain. The latest modern practices in the manufacture and application of brake linings and drums have, however, developed these parts to the point where we can depend upon a fairly constant coefficient of friction. It is reasonable, therefore, to consider this factor disposed of.

The third and by far most important element is the pressure applied to the bands or shoes—**THIS PRESSURE MUST BE EQUAL under all conditions.**

Equal pressure against the shoes or bands has never been obtained and *MAINTAINED* by any manual or power system that is complicated by levers, pull rods, universals, shafts and cams. Although difficult, brakes can be equalized in the shop by a mechanic, but lost motion, wear and vibration soon undo this work. Only a system that is **AUTOMATICALLY SELF-EQUALIZING** can be depended upon to stay equalized; and further, such a system must

automatically equalize the pressure applied to the bands, regardless of the amount of wear upon the bands, and regardless of other variable factors.

Obviously a system which will maintain this automatic equalization must be simple in construction, and direct in action, with the minimum of moving parts between the actuating mechanism and the brake band. Likewise its power must be transmitted by a fluid—i.e., air, oil or a similar agent. The pressure in a fluid system is equal throughout, and when directly applied, the ideal of **AUTOMATIC SELF-EQUALIZATION** is attained. In no other way is this possible.

The brake system that automatically maintains equal braking pressure at the point of application will also be completely free from brake adjustment. If there is sufficient movement in the mechanism to take up all wear of the liner and "follow-up" of the drum the brakes will need no adjustments from the time a set of liners is put in until it is completely worn out.

The result of such a system will be safe, effective braking at all times; and entire relief from the expense and delays incidental to frequent brake inspection and adjustment.

This is the third of an informative series on Bus brakes. The series consists of:

- A—What Brakes Must Do.
- B—How many wheels should brakes go on?
- C—Self-equalization and brake adjustments.
- D—Curing the skid.
- E—Metal to metal or molded linings—which?
- F—Braking Power.
- G—Compressor Mountings and Drives.
- H—Compressor Cooling.
- I—The Control Valve.
- J—Maintenance on Different Types.

The other topics will appear in the above order. Address any comments, suggestions, or requests for advance information to—

The Christensen Air Brake Co.
6513 Cedar Ave., Cleveland, O.





Over 40,000 buses have followed the Budd-Michelin road of experience

BEFORE the bus industry started the Budd-Michelin Dual Wheel was making history.

It had battled war-torn roads where no other wheel could stand the punishment—and triumphed!

The bus industry saw its advantages. Here was a wheel that made it possible for heavy buses to ride on pneumatics. It meant the economy of interchangeable wheels and tires—and one wheel-service for the fleet.

Today over 40,000 heavy buses are rolling up from 15,000 to 20,000 profitable miles from a set of tires on Budd-Michelin Dual Wheels. The road that's paved with such experience is a safe road to follow.

B U D D

WHEEL COMPANY

Detroit

The Budd-Michelin equipment—two Budd-Michelin single wheels in front, two Budd-Michelin Dual Wheels in the rear (pairs of single wheels acting together as units.) All wheels completely interchangeable either as units or as halves of Duals. One spare.





The Passenger's View

Nothing contributes more to the selling of service by motor coaches than comfort and a feeling of real security.

Graham Brothers Coaches appeal to the rider because they are built from the *passengers'* viewpoint. It is they who appreciate the handsome low body, the riding comfort obtained by the well upholstered and amply spaced

seats, the wide aisle and proven safety as the driver easily winds in and out of traffic. They know that the Dodge Brothers Engine can be relied upon to perform under the very trying conditions of every-day bus operation.

These are the qualities that will attract the rider.

Street Car Type
Motor Coach,
Complete,

\$3815


F. O. B. Detroit

GRAHAM BROTHERS

Evansville - DETROIT - Stockton
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED - TORONTO, ONTARIO

GRAHAM BROTHERS MOTOR COACHES

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE



“**Body-**
the principal part
of anything”
—Webster

CONSULT Noah Webster and other dictionary compilers, and that's what they will tell you. It's worth heeding when you buy a bus.

A husky motor, long-lived tires, and reliable drivers are assets, of course, but the One Biggest Question in the *public mind*, in the minds of your prospective passengers, is “*Are the busses convenient and comfortable?*” That's what will attract them your way, teach them the bus-riding habit and coax them away from other forms of public transportation and from their own automobiles.

Leg-room, elbow-room, head-room, luggage-space, freedom from jounce, free vision, easy access to seats, freedom from squeaks, interior conveniences and refinements—these are the factors which make all the difference between a half-empty coach and a full-up pay-load. These are the points which inspire favorable comment—the finest kind of advertising for you—and make people anxious to try a ride with you.

Because its study of bus transportation has convinced The Baker-Raulang Company that the greatest single need of the Bus Industry is the elimination of awkward, inconvenient and uncomfortable vehicles from the streets and highways, and making it possible for the operator to carry the greatest possible number of comfortably-seated passengers for a given length of wheelbase, The Baker-Raulang Company has set up as the motto of its Bus Body Department—“*To promote public popularity.*”

In every type of body it designs the goal will be to improve upon existing standards of the industry and develop a body which will definitely and measurably attract trade and win public favor.

We are already prepared to explain by letter several accomplishments new to bus body designing which have emphatically passed the all-important test of outspoken public approval.

THE BAKER-RAULANG COMPANY · Raulang Bus Body Division · CLEVELAND, OHIO

Baker
Raulang
BUS
BODIES

To Promote Public Popularity

The Beautiful Coaches of
INTERNATIONAL HARVESTER
Manufacture Lend Distinction
to the Proudest Highways

THE success of the International Harvester Company in motor coach development is founded on the firm foundation of over twenty years' automotive experience.

Merit in design and mechanical detail, beauty of line, and perfection of body appointment have built a consistent high reputation for International Motor Coaches and called them to service on good and bad roadways the nation over.

The various bodies supplied for the 6-cylinder chassis carry 24 to 33 passengers. Regular equipment includes air brakes on all four wheels. The International SL 4-cylinder coach (12 to 14-passenger) offers extra advantages of flexibility and economy, either as main units for many requirements or as auxiliaries to larger enterprises. Write the Chicago address for special information.

INTERNATIONAL HARVESTER COMPANY
 606 So. Michigan Ave. of America Chicago, Illinois
 (Incorporated)

*A fleet of 37 International Harvester Coach, Davis Shores, St. Augustine, Fla.
 One of a popular fleet of 37 International 6-cylinder parlor coaches being
 operated throughout Florida by the Blue Bus Line of Tampa*

INTERNATIONAL offers unparalleled service to coach owners, rendered through the world's largest Company-owned truck and coach service organization. Company-owned branches now at 120 points in the United States and 17 in Canada, supplemented by the service of our automotive dealers.





For Motor Bus and Electric Railway Service



The fact that among the hundreds of electric railways and motor bus companies now using Ohmer Fare Registers, there are one hundred and forty-eight that have used them for periods varying from ten to twenty-six years is significant of the correctness of the principles on which the Ohmer System is based.

The constant and steady building up of the morale among your transportation salesmen; the certain elimination of fare collection losses by making the best interests of your men identical with your own; the exact-

ness and permanency of the statistics gathered from the printed register records—these are some of the reasons why the Ohmer System of Fare Protection is being adopted by progressive managers everywhere.

The Ohmer Fare Registers of today are made in many different types and sizes to meet every possible requirement of modern transportation methods.

If you are not sure that your fares are being effectively safeguarded write to us about it.

OHMER FARE REGISTER CO.

Address Dept. A.

Dayton, Ohio, U. S. A.

OHMER

REG. U.S. PAT. OFF.

FARE REGISTERS

Gibraltar Bodies



Twenty-one passenger street car type Studebaker busses for South Bend Indiana Railroad

Studebaker—South Bend—Gibraltar Bodies

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


are principles incorporated in these clean cut, attractive, rugged Studebaker busses. Only quality bodies mounted on quality chassis could make these principles facts. That is why the Chicago, South Bend & Northern Indiana Railway Company purchased Studebaker chassis with Gibraltar Bodies.

Gibraltar Bodies have ride compelling attractiveness and patronage continuing comfort—they are sturdy of construction, yet of light weight giving low operating cost—they have ample aisle and head room yet are low and safe, giving the passenger a sense of security—they are arranged so drivers have clear vision and easy control of car and passengers. Built of the best material and workmanship to Studebaker designs and specifications, Gibraltar bus bodies are standard equipment on pay-enter busses built by the Studebaker Corporation of America.

THE AUTO BODY COMPANY

LANSING, MICHIGAN



Designers and Manufacturers of Motor Coach and Bus Bodies  Open and Enclosed Automobile Bodies

Better finish in less time!

NITRO-VALSPAR

The Valentine Lacquer Finish

One way to keep your cars on the road

is to keep them out of the paint shop—
by having them Nitro-Valsparred.

Nitro-Valspar keeps its good looks. Long after ordinary finishes are shabby and dull, Nitro-Valspar shines like new. Its durability is amazing.

Nitro-Valspar saves time in application. All coats from Primer to Final coat are lacquer materials and may be applied in two days' time, if necessary.

Valentine Company

Seeing is believing

A large section of a steel car finished with Nitro-Valspar is on exhibition at the Valentine booth, number 57, at the Railway Car Accessory Manufacturers Exhibition, Young's Pier, Atlantic City, June 9-16th. Come and see it. You'll find a finish there worth investigating.



Modern Cars

Essential to Progress

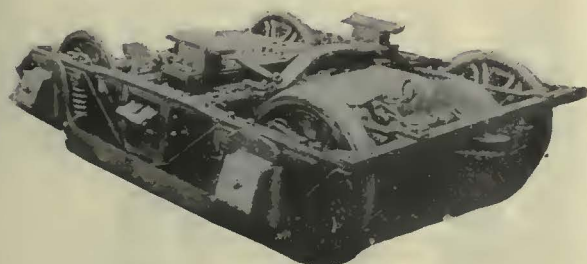
Today's conditions require better equipment — light weight, better operating characteristics, and more attractive appearance—in other words *modern cars*.

Let our engineers help you develop equipment for your modernization program.

We will gladly offer designs and estimates, or quote on your plans and specifications.



For feeders and co-ordinated service, the Cummings Gas-Electric Motor Coach offers the most modern form of automotive vehicle.



Type MC-62 Light Weight Low Car Body Truck
for City and Interurban Service

CUMMINGS CAR AND COACH CO.

Successors to McGuire-Cummings

111 W. Monroe St., Chicago, Ill.



**Texaco
Liquid Grease "D"**

being applied to controller fingers on a car of the Third Avenue Railway System, 65th Street and Third Avenue, New York City.

33/47.

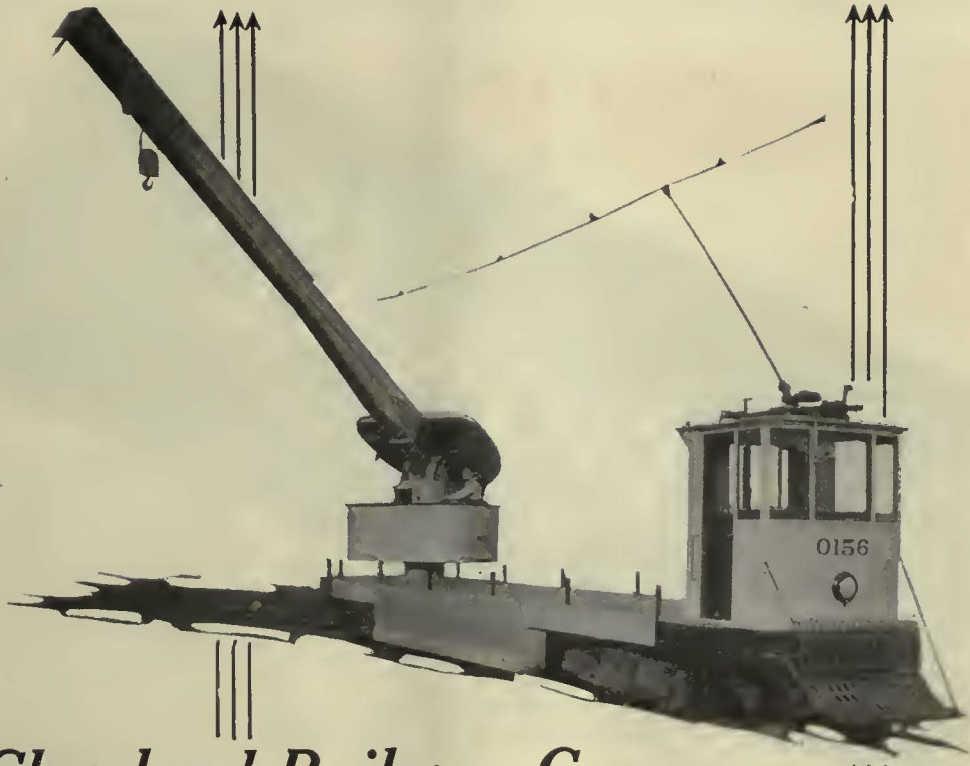
TEXACO



The Chosen Lubricant
of **ELECTRIC RAILWAYS**



The Texas Company, U. S. A., 17 Battery Place, New York City
OFFICES IN PRINCIPAL CITIES



On the Cleveland Railway Co.

Built for rugged service, this Differential Crane Car depends on "STANDARD" Rolled Steel Wheels to help maintain its record of performance.



Rolled Steel Wheels
 Quenched and Tempered
 Carbon Steel Axles
 Coil and Elliptic Springs

STANDARD STEEL

WORKS COMPANY

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TUBULAR STEEL POLES

THE experience of leading street railway companies throughout America with their overhead construction points to less interruption to service, lower upkeep, greater reliability and longer life of the installation when these poles are used. There is another advantage of tubular poles—their straightness and general uniformity give a neat appearance to the street wherever used.

Besides electric railway service, these poles are adaptable to electric transmission; signal; telephone, telegraph and street lighting service, and are particularly adaptable for combination services.

Bulletin No. 14—"NATIONAL" Tubular Steel Poles—contains information on manufacture, installation and service conditions, and tables of sizes, weights, lengths, etc. This Bulletin will be sent on request.



NATIONAL TUBE COMPANY, PITTSBURGH, PA.

GENERAL SALES OFFICES: FRICK BUILDING

DISTRICT SALES OFFICES

Atlanta Boston Chicago Denver Detroit New Orleans New York Salt Lake City Philadelphia Pittsburgh St. Louis St. Paul
Pacific Coast Representatives: U. S. Steel Products Co. San Francisco Los Angeles Portland Seattle
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In Pittsburgh
and
in Cleveland
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in Columbus
and
in Kansas City
and
in Cincinnati
and
in St. Louis
and
in Chicago

and in most of the important cities of United States, Carnegie Steel Cross Ties will be found in track that has proved a sound investment, not only from the standpoint of economy, but because of the excellent character of service rendered. Carnegie Steel Cross Ties will do much toward lowering your track maintenance costs, and at the same time providing a smoother and more efficient track.

Booklet—"Steel Cross Ties"—on request.

CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue

PITTSBURGH

PENNSYLVANIA



STUD TERMINAL RAIL BONDS



View of main line New York, New Haven and Hartford Railroad. Insert is our type CPOF Bond a concealed type of bond which is used on all main line tracks.

Performance is the best means by which the efficiency of a rail bond can be determined.

The use of Stud Terminal Rail Bonds, exclusively by the New York, New Haven and Hartford Railroad clearly indicates that this type of bond has stood the test of time.

No bond has more convincingly demonstrated its efficiency and ease of maintenance on lines carrying heavy traffic.

The catenary messengers shown in the illustration are Extra High Strength Galvanized Steel, furnished by the American Steel and Wire Company.

AMERICAN STEEL & WIRE COMPANY

SALES OFFICES

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CLEVELAND...Rockefeller Building
DETROIT....Foot of First Street
CINCINNATI...Union Trust Building
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ST. LOUIS.....506 Olive Street
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OKLAHOMA CITY
First Nat'l Bank Bldg.
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BOSTON.....185 Franklin Street
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PHILADELPHIA...Widener Building
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WORCESTER.....91 Grove Street

BALTIMORE....32 So. Charles St.
BUFFALO.....670 Ellicott Street
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DALLAS.....Praetorian Building
DENVER...First National Bank Bldg.
SALT LAKE CITY...Walker Bk. Bldg.

UNITED STATES STEEL PRODUCTS COMPANY, San Francisco, Los Angeles, Portland, Seattle

Douglas Fir—America's Permanent Lumber Supply



An unusual picture

Out in the Douglas Fir country on the West Coast, a photographer who makes a specialty of forest pictures found he could not bring to his pictures a conception of the true size of the Douglas Fir.

With real ingenuity he used two negatives and created this composite picture which compares the mighty Douglas Fir with ten-story office buildings.

One of these trees would build a five-room home.

THE DENSEST and heaviest forests the world has ever known stand today between the west slope of the Cascade Mountains and the waters of the Pacific.

This forest region contains 26 million acres of towering trees—more than 700 billion feet of merchantable timber—three-quarters of which is Douglas Fir; the rest Sitka Spruce, Western Hemlock and Western Red Cedar.

The average yield of these forests is in excess of 30,000 feet per acre and in some cases 150,000 feet and more. One Douglas Fir tree here sometimes produces more lumber than five acres in other forest regions.

What is of more vital interest to the people of the United States is that under modern methods of lumbering, foresting and fire protection, these forests will be a permanent source of lumber supply for the entire country for all time.

Where timber has been cut and fires guarded against countless millions of young Douglas Fir trees from Nature's own seeding appear, and in their vigorous growth offer a new merchantable supply of the finest quality within a comparatively few years.

Emphasizing the importance of Douglas Fir, we quote from U. S. Forest Service Bulletin 88:

"Douglas Fir may, perhaps, be considered the most important of American woods . . . its rapid growth in the Pacific Northwest forests, its comparatively wide distribution, and the great variety of uses to which it can be put place it first . . . As a structural timber it is not surpassed."

[[An illustrated treatise on Douglas Fir, written by a forester, telling why this is the wood of tomorrow as well as today, and how to use it, sent on request]]

Address WEST COAST LUMBER TRADE EXTENSION BUREAU 5562-T STUART BUILDING, SEATTLE, U. S. A.

Durable Douglas Fir

AMERICA'S PERMANENT LUMBER SUPPLY

Use this coupon

WEST COAST LUMBER TRADE EXTENSION BUREAU 5562-T STUART BUILDING, SEATTLE, WASHINGTON

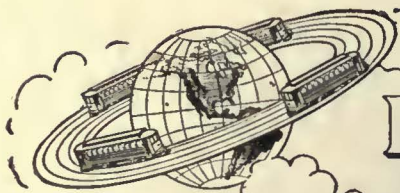
Gentlemen: Please send me a copy of your booklet "Douglas Fir, America's Permanent Lumber Supply."

Name _____

Street _____

Place _____

The creation and maintenance of car advertising space values requires the same degree of highly specialized knowledge as the construction and maintenance of railroads. Such tasks should be delegated only to those of widest experience and longest record of success.



Barron G. Collier

INCORPORATED
CANDLER BLDG. NEW YORK

Each of Your Salesmen Should Have the 1926 Edition Electric Railway Directory

Because:—

All purchases are passed upon by two and often three officials before the order is placed. If your salesmen are not procuring orders they are not interviewing the proper officials.

With 65% changes in this directory over 1925, it is very important your salesmen are directed right to save time and possibly embarrassment.

\$296,000,000 will be spent this year for new equipment, material and supplies—Can your salesmen afford to make one false step on his introduction?

The above holds true respecting your mailing lists. With six changes for each property listed makes your old mailing list practically worthless.

It is too expensive to have your literature go wrong. In fact the directory pays for itself many times over the first campaign.

Price \$7.50 for one copy—

10% off for five or more.

Leading Features

- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico, and the West Indies.
- 2—List and addresses of officials, superintendents, department heads and purchasing agents, corrected to date of issue.
- 3—Addresses of companies operating buses.
- 4—Addresses of bus repair shops.
- 5—Mileage of track and bus routes.
- 6—Number and kinds of cars used.
- 7—Rates of fare.
- 8—Amusement parks owned or reached.

Directory
Department,
Electric Rail-
way Journal,
10th Avenue and
36th St., New York,
N. Y.

Gentlemen:—Will you please send me:

.....copies of 1926 McGraw
Electric Railway Directory, check
for \$..... enclosed.

.....More complete information con-
cerning contents.

Name

Company

Street

CityState

E.R.J. 6-5-23

OFFICIAL RESOLUTIONS
 Passed by
THE NATIONAL DISTRIBUTION CONFERENCE
 Washington, December 16, 1925

SUMMARY OF CONCLUSIONS

The National Distribution Conference was initiated to examine processes of distribution and conditions vital to the industry. The purpose was to identify and eliminate obvious wastes and to attain a better understanding, to attain such unwarranted criticism due to misconceptions. Misunderstandings about distribution are so general and such unwarranted assumptions that statement of present methods developed by economic and fundamentally sound:

(b) The essential distribution functions now performed by various agencies are fundamental and none may be eliminated but must be assumed, replaced by new methods.

(c) Wasteful practices as they exist are not inherent in the present machinery of distribution, but arise through human failings such as lack of definite organized information and the imperfection of performance which characterizes alike producer, manufacturer and distributor.

Overcome this human failing

A. B. P.

The advertisers in this publication demonstrate by their presence here that they are awake to modern methods of selling as well as production—methods that cut costs and standardize operations.

The manufacturer has neither the news gathering facilities, nor the organization to select, sift and present the facts and information that he needs.

That is the work of good Business Papers, the best of which are members of the Associated Business Papers, Inc., an organization based

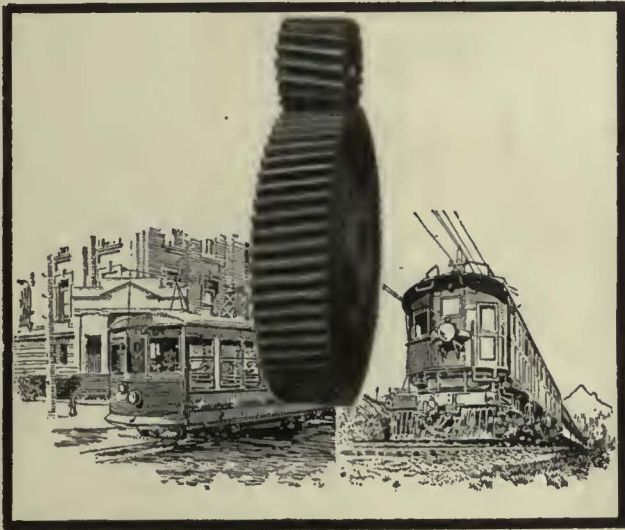
on quality and service, covering 56 fields of trade and industry.

Treat these journals as a silent business partner, connect up with these pipe lines of contemporary thought and practice in industry, and reap full benefit from their selected information.

THE ASSOCIATED BUSINESS PAPERS, Inc., Executive Offices: 220 West 42nd Street, New York, N. Y.

Electric Railway Journal is a member of The A. B. P.

Do away with gear noise!



Nuttall Helical Gears meet present day requirements

Noisy spur gears are no longer tolerable. They're an unnecessary source of public irritation. Worse still, they wear faster and cost more in the long run.

The answer to the modernization problem in gearing is—Nuttall Helical Gears on all your cars. Their smooth, silent operation, at any speed, means better operating conditions all round.



R.D. NUTTALL COMPANY
PITTSBURGH PENNSYLVANIA

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



The Modern "Gunga Din"

Curse Him if You will—

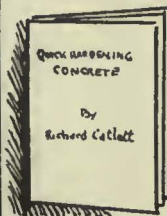
but you've got to have him. And you've got to adapt your methods to his limited experience and undeveloped understanding.

If he's running your concrete mixer, and you need quick hardening concrete--you'll save mistakes and win Tony's everlasting gratitude by giving him CAL.



CAL is easy to store, easy to handle, easy to measure by volume, easy to add at the mixer right along with the cement and aggregates.

Because it's a white, dry powder, Tony always knows whether he's added it or not -- and you avoid all risks of no dose or double dose.



Other advantages of CAL are fully discussed in the book illustrated to the left. A copy is waiting for you. North American Cement Corporation, Hagerstown, Md.



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

Griffin Wheel Company

410 North Michigan Ave.
Chicago, Ill.

GRIFFIN
F. C. S.
WHEELS

For Street and Interurban
Railways

FOUNDRIES:

Chicago
Detroit
Denver

Boston
Kansas City
Council Bluffs

St. Paul
Los Angeles
Tacoma

Greater Service Per Dollar Invested



“Tiger” Bronze Axle and
Armature Bearings

More-Jones “Tiger” Bronze castings for axle and armature-bearing service was one of our early achievements. This is probably the most widely known bronze on the market. It has stood the test of time. There is nothing better for long, efficient and most economical results. Let us quote you.

More-Jones Brass & Metal Co.
St. Louis, Mo.

MORE-JONES
QUALITY PRODUCTS



DIXON PAINT
RED LEAD-GRAPHITE PRIMER
ALUMINUM-GRAPHITE
SILICA-GRAPHITE

Consider the high cost of repainting and use one of Dixon's Paints. They will give better protection for exposed metal or wood work at lowest cost and meet the requirements of all specifications.

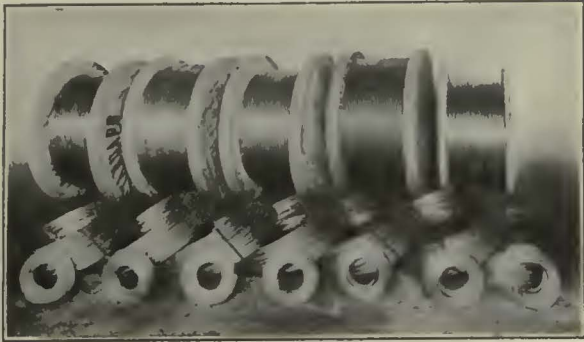
The pigment, flake silica-graphite, provides a tough yet elastic film that expands and contracts with the heat and cold without cracking or peeling. The graphite and silica are naturally and not artificially combined, resulting in long life, efficient surface protection, elasticity and resistance to dampness.

Write for Booklet 180-B. “Protective Paint”

JOSEPH DIXON CRUCIBLE CO.

JERSEY CITY, N. J.

Established 1827



**STANDARD
Copper and Bronze Wires**

for Trolley and Transmission Service

are rolled and drawn in our own mills and carefully inspected at every step in the process. They meet every requirement of the most difficult operating conditions.

If you are interested in high quality wire at an economical price, write our nearest office.

Standard Underground Cable Co.

BOSTON PHILADELPHIA PITTSBURGH CHICAGO
NEW YORK WASHINGTON DETROIT ST. LOUIS
SAN FRANCISCO

FOR CANADA: STANDARD UNDERGROUND CABLE CO. OF CANADA, LIMITED, HAMILTON, ONT.

PANTASOTE

Trade Mark

Seat and Curtain Materials
There is no substitute for Pantasote

AGASOTE

Trade Mark

Roofing—Headlining—Wainscoting
The only homogeneous panel board

*standard
for electric railway cars
and motor buses*



82% use Tool Steel gears.

**The A. E. R. A. Equipment
Committee—1924-1925**

THE 1924-1925 A. E. R. A. Equipment Committee consisted of 14 railway men representing many of the large and aggressive companies. Their companies controlled a total of 16,992 cars. The line-up regarding their use of "Tool Steel" gears is as follows:

Exclusive Users—6 companies controlling 8003 cars.....	47%	} 82%
Part Users—5 companies controlling 5971 cars.....	35%	
Companies Testing—1 company controlling 1435 cars.....	9%	
Non-Users—2 companies controlling 1583 cars.....	9%	

Remember, the companies in this tabulation were selected by the A. E. R. A. as the live wires on equipment. They certainly know quality when it comes to gears.

**The Tool Steel Gear &
Pinion Co.,
Cincinnati, Ohio**



**TOOL-STEEL QUALITY
GEARS AND PINIONS**



R 11 Double Register

*Both our latest single
and double registers
are now equipped
for electric as well as
mechanical hand or
foot operation.*

**Full Electric
Operation of
Fare Registers**

A completely satisfactory fare registration system is one that has the confidence of the public, the conductor and the accounting department. The simplicity and accuracy of International Registers maintained for more than thirty years, is combined in the later types with the extra speed and convenience of electric operation.

**The International Register Co.
15 South Throop St., Chicago**



Complete satisfaction

Operating perfectly and requiring minimum attention for maintenance and lubrication, Earll Catchers and Retrievers give genuinely satisfactory results. Their refinement of design, and mechanical superiority are summarized in the following five features, peculiar to Earll construction.

- No-wear Check Pawl
- Free-Winding Tension Spring
- Ratchet Wind
- Emergency Release
- Perfect Automatic Lubrication

Earll Catchers and Retrievers
C. I. EARLL, York, Pa.

Canadian Agents:
 Railway & Power Engineering Corp., Ltd., Toronto, Ont.
In All Other Foreign Countries:
 International General Electric Co., Schenectady, N. Y.

PERFECT MICANITE INSULATOR

Reg. U. S. Pat. Off.

ELECTRICAL INSULATION

Micanite armature and commutator insulation, commutator segments and rings, plate, tubes, etc., Empire oiled insulating materials; Linotape; Kablak; Mico; and other products—for the electrical insulating requirements of the railway.

Catalogs will gladly be furnished

MICA INSULATOR COMPANY

Sole Manufacturers of Micanite

Established 1893

68 Church St., New York 542 So. Dearborn St., Chicago
 Works: Schenectady, N. Y.

8-F

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.,
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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
 Hardware makes the line
 Hubbard makes the
 Hardware*



Hubbard and COMPANY
 PITTSBURGH • OAKLAND, CAL. • CHICAGO

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



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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

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DETROIT, Ford Building
NEW ORLEANS, 344 Camp 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

WORKS
Bayonne, N. J.
Barberton, Ohio

The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
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Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crana Car
Clerk Concrete Breaker
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THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

Bethlehem Products for Electric Railways

Tee and Girder Rails; Machine Fitted Joints;
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Center Rib Base Plates; Rolled Steel Wheels and
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Pole Line Material.

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BETHLEHEM

Wharton Special Trackwork

Trackwork of superior quality,
incorporating the famous
Tisco Manganese Steel.

WM. WHARTON JR. & CO., Inc.
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OFFICES:

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SPECIALISTS

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*Standard—Insulated—and
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The Rail Joint Company
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Special Track Work of every
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THE BUDA COMPANY
Harvey (Suburb Chicago) Illinois

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Johnstown, Pa.

Sales Offices:

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If he says "they'll go" they'll go ~

If the inspection and testing of the materials and workmanship in the motor busses you buy are in the hands of the P.T.L. Inspectors—you are not only assured of the highest quality throughout but you know that every part is in perfect running order and will give the service you have a right to expect.

P.T.L. Bulletin No. 28 gives all the facts covering this service.

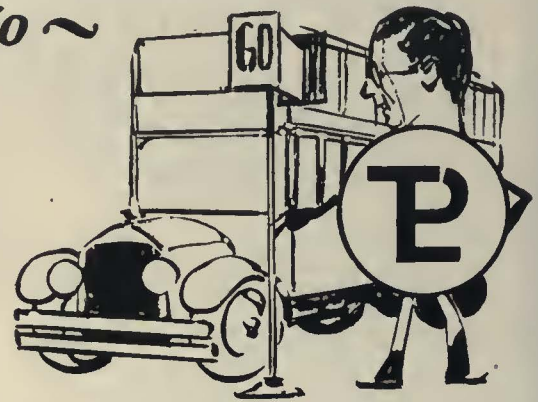
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Inspecting Engineers and Chemists

PITTSBURGH

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Branch Offices in the Principal Cities.



AIMco Electric Railway Automatic Signals

for Accessibility and Reliability

EST. 1855 **AIMco** INC. 1915
"American" INSULATING MACHINERY COMPANY

Philadelphia, New York, Paris, England

Sales Agents:
Electric Service Supplies Co.
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We make a specialty of
ELECTRIC RAILWAY LUBRICATION

We solicit a test of TULCO on your equipment

The Universal Lubricating Co.

Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company,
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Black and Yellow Varnished Silk, Varnished Cambric, Varnished Paper

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DON'T REMOVE WORN WHEELS

This shoe does the work while your car is in service.

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WHEEL TRUING BRAKE SHOE CO.
Detroit, Mich.

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National Railway Appliance Co.

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| Tool Steel Gears and Pinions | Fort Pitt Spring and Mfg. Co.,
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| Genesco Paint Oils | Anderson Slack Adjusters |
| Dunham Hopper Door Device | Yellow Coach Mfg. Company—
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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.

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.

E R J

POSITIONS WANTED

TEN years' experience as railway winder. Steam and electric railway experience. Can give A-1 statement in regard to my work. Will go anywhere. PW-911, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

YOUNG MAN, 28, wide experience motor bus operation. Sound secretarial, accountancy, traffic, engineering experience. Now holding executive appointment with large British Company operating 700 vehicles, would consider similar appointment in U. S. A. Unlimited scope essential for real live man of sound experience and proved judgment. PW-913, Electric Railway Journal, Tenth Ave. at 36th St., New York.

To Employers Who Advertise for Men:

The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered.

When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. Others do not receive the slightest indication that their letters have even been received, much less given any consideration. These men often become discouraged, will not respond to future advertisements, and sometimes even question if they are bona fide.

We can guarantee that *Every Advertisement Printed in the Searchlight Section Is Duly Authorized.* Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked, say, "Position filled, thank you." If you don't care to reveal your identity, mail them in plain envelopes.

We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements.

Searchlight Department
 MCGRAW-HILL PUBLISHING COMPANY, INC.
 "Put Yourself in the Place of the Other Fellow"

OFFICIAL PROPOSALS

Bids: June 16.

Special Trackwork Channels and Appurtenances—Broad Street Subway

CONTRACT NO. 124
 DEPARTMENT OF CITY TRANSIT
 11th FLOOR, 1211 CHESTNUT ST.

Philadelphia, May 18, 1926.

Sealed proposals, addressed to the undersigned, at the office above mentioned, will be received until 11 o'clock (Eastern Standard Time), on Wednesday, June 16, 1926, and publicly opened immediately thereafter, for furnishing special trackwork, channels and appurtenances for the Broad Street Subway.

Plans and specifications may be seen at the office of the Department, on the 12th floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of Fifty (50) Dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia, to the amount of five (5) per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS,
 Director.

OFFICIAL PROPOSALS

Bids: June 23.

Special Trackwork and Appurtenances—Terminal Yard—Broad Street Subway

CONTRACT NO. 125
 DEPARTMENT OF CITY TRANSIT
 11TH FLOOR, 1211 CHESTNUT ST.

Philadelphia, May 25, 1926.

Sealed proposals, addressed to the undersigned, at the office above mentioned, will be received until 11 o'clock (Eastern Standard Time), on Wednesday, June 23, 1926, and publicly opened immediately thereafter, for furnishing special trackwork, and all appurtenances for the Fern Rock Terminal Yard of the Broad Street Subway.

Plans and specifications may be seen at the office of the Department, on the twelfth floor, 1211 Chestnut Street, and copies of same, with blank forms for proposals, will be supplied to intending bidders upon application. A deposit of Fifty (50) Dollars will be required for the plans and specifications. This deposit will be refunded upon return of the plans and specifications in good condition.

Bidders must be skilled and regularly engaged in the class of work for which they are competing.

No bid will be considered unless accompanied by a certified check on a responsible bank or trust company in favor of the City of Philadelphia to the amount of five (5) per centum of the sum of such bid, in accordance with the provisions of an ordinance approved March 7, 1924, as amended by ordinance approved July 2, 1924, and reprinted in full in the specifications.

The Director reserves the right to reject any or all bids, as he may deem best for the interest of the City of Philadelphia.

H. E. EHLERS,
 Director.

Rotary Converters

- 1—500 kw., 600-v., 833 amp., 900 r.p.m., 6-ph., compound wound Westinghouse Rotary Converter, with 3—165 kva., 60-cy., single ph., 13200 v. primary transformers with A.C. and D.C. panels.
- 1—300 kw., 600-v., 500 amp., 1200 r.p.m., 6-ph., compound wound interpole Westinghouse Rotary Converter, with 3—110 kva., 60-cy., single ph., 13200-v. primary transformers with A.C. and D.C. panels.

GEO. SACHSENMAIER CO.
 926 N. Third St., Philadelphia, Pa.

S EARCHLIGHT
 E RVICE
 E CURES
 A TISFACTORY
 I TUATIONS

G-23

SAVE 30% TO 50% ON
RAILS-LOCOMOTIVES-CARS

**Economy—Service
 Quality—Reliability**

**HYMAN-MICHAELS
 COMPANY**

Peoples Gas Bldg., Chicago

ST. LOUIS — DALLAS — LOS ANGELES
 SAN FRANCISCO — PORTLAND — SEATTLE

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.

WHAT AND WHERE TO BUY

Equipment, Apparatus and Supplies Used by the Electric Railway Industry
with Names of Manufacturers and Distributors Advertising in this Issue

Advertising, Street Car
Collier, Inc., Barron G.

Air Brakes
Christensen Air Brake Co.
Westinghouse Air Brake Co.

Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Armature Shop Tools
Elec. Service Supplies Co.

Automatic Return Switch
Stand
Ramapo Ajax Corp.

Automatic Safety Switch
Stands
Ramapo Ajax Corp.

Axles
Bemis Car Truck Co.
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
Standard Steel Works
Westinghouse Elec. & Mfg. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.

Babbit Metal
Ajax Metal Co.
Johnson & Co., J. R.
More-Jones Brass & Metal Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Batteries, Dry
National Carbon Co.
Nichols-Lintern Co.

Bearings and Rearing Metals
Ajax Metal Co.
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
More-Jones Brass & Metal Co.
Westinghouse Elec. & M. Co.

Bearings, Center and Roller
Side
Stuckl Co., A.

Bells and Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.

Benders, Rail
Railway Track-work Co.

Bodies, Bus
Auto Body Co., The
Baker-Raulang Co., The
Cummings Car & Coach Co.

Bodies, Passenger Car
Baker-Raulang Co., The
Body Material, Haskellite & Plymett
Haskellite Mfg. Corp.

Boilers
Babcock & Wilcox Co., The
Boiler Tubes
National Tube Co.

Bond Testers
Amer. Steel & Wire Co.
Elec. Service Supplies Co.

Bonding Apparatus
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Track-work Co.
Una Welding & Bonding Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts etc.)
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
Nat'l Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Bemis Car Truck Co.
Brill Co., The J. G.
Wheel Truing Brake Shoe Co.

Brakes, Brake Systems and Brake Parts
Bemis Car Truck Co.
Brill Co., The J. G.
General Electric Co.
National Brake Co.
Safety Car Devices Co.
Westinghouse Tr. Br. Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbone Co.
National Carbon Co.
Westinghouse Elec. & M. Co.

Brushes, Graphite
National Carbon Co.

Brushes, Metal Graphite
National Carbon Co.

Brushes, Wire Pneumatic
Ingersoll-Rand Co.

Bulkheads
Haskellite Mfg. Corp.

Buses, Motor
Auto Body Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Graham Bros.
International Harvester Co.
International Motor Co.
Mack Trucks
Yellow Truck & Coach Mfg. Co.

Bus Seats
Hale-Kilburn Co.

Busings, Case Hardened and Manganese
Bemis Car Truck Co.
Brill Co., The J. G.

Cables
(See Wires and Cables)

Cambrie Tapes, Yellow & Black Varnish
Irvington Varnish & Ins. Co.

Cambrie Yellow & Black Varnish
Mica Insulator Co.

Carbon Brushes
(See Brushes, Carbon)

Carbon Paste, Welding
National Carbon Co.

Carbon Plates, Welding
National Carbon Co.

Carbon Rods, Welding
National Carbon Co.

Car Lighting Fixtures
Elec. Service Supplies Co.

Car Panel Safety Switches
Consolidated Car Heating Co.
Westinghouse Elec. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co., Inc.

Cars, Gas, Rail
Brill Co., The J. G.
Cars, Passenger, freight Express, etc.
American Car Co.
Brill Co., The J. G.
Cummings Car & Coach Co.
Kuhlman Car Co., G. C.
National Ry. Appliance Co.
Wason Mfg. Co.

Cars, Second Hand
Electric Equipment Co.

Cars, Self-Propelled
Brill Co., The J. G.
General Electric Co.

Castings, Brass Composition or Copper
Ajax Metal Co.
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
Amer. Steel Foundries
Bemis Car Truck Co.
Standard Steel Works
Wm. Wharton, Jr. & Co.

Castings, Malleable & Brass
Bemis Car Truck Co.
Catchers and Retrievers, Trolley
Earll, C. I.
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Ceiling Car
Haskellite Mfg. Corp.
Pantasote Co., Inc., The
Cellulose Plywood Panels
Haskellite Mfg. Corp.

Cement
N. Amer. Cement Corp.

Cement Accelerator
North American Cement Corp.

Change Carriers
Cleveland Fare Box Co.
Electric Service Supplies Co.

Circuit Breakers
General Electric Co.
Westinghouse Elec. & M. Co.

Clamps and Connectors for Wires and Cables
Elec. Ry. Equipment Co.
Elec. Ry. Improvement Co.
Elec. Service Supplies Co.

General Electric Co.
Hubbard & Co.
Ohio Brass Co.
Westinghouse Elec. & M. Co.

Cleaners and Scrapers, Track
(See also Snow-Flows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.

Clusters and Sockets
General Electric Co.

Coal and Ash Handling
(See Conveying and Hoisting Machinery)

Coil Banding and Winding Machines
Electric Service Sup. Co.
Westinghouse Elec. & M. Co.

Colls, Armature and Field
General Electric Co.
Westinghouse Elec. & M. Co.

Colls, Choke and Kicking
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Coin-Counting Machines
Cleveland Fare Box Co.
International Register Co.

Coin Sorting Machines
Cleveland Fare Box Co.

Coin Wrappers
Cleveland Fare Box Co.

Commutator Slotters
Electric Service Supplies Co.
General Electric Co.
Westinghouse Elec. & M. Co.
Wood Co., Chas. N.

Commutator Truing Devices
General Electric Co.

Commutators or Parts
Cameron Elec'l Mfg. Co.
General Electric Co.
Westinghouse Elec. & M. Co.

Compressors, Air
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Tr. Br. Co.

Compressors, Air Portable
Ingersoll-Rand Co.

Condensers
General Electric Co.
Ingersoll-Rand Co.
Westinghouse Elec. & M. Co.

Condenser Papers
Irvington Varnish & Ins. Co.

Conduits, Underground
S. J. Underground Cable Co.

Connectors, Solderless
Westinghouse Elec. & M. Co.

Connectors, Trailer Car
Consolidated Car Heating Co.
Elec. Service Supplies Co.
Ohio Brass Co.

Controllers or Parts
General Electric Co.
Westinghouse Elec. & M. Co.

Controller Regulators
Electric Service Supplies Co.

Controlling Systems
General Electric Co.
Westinghouse Elec. & M. Co.

Converters, Rotary
General Electric Co.
Westinghouse Elec. & M. Co.

Copper Wire
American Brass Co., The
American Steel & Wire Co.
Anacoda Copper Mining Co.

Copper Wire Instruments, Measuring, Testing and Recording
American Brass Co., The
Anacoda Copper Mining Co.

American Steel & Wire Co.
Card, Bell, Trolley, Register, etc.
Brill Co., The J. G.
Electric Service Supplies Co.
International Register Co.
Roebing's Sons Co., John A.
Samson Cordage Works
Silver Lake Co.

Cord Connectors and Conplers
Electric Service Supplies Co.
Samson Cordage Works
Wood Co., Chas. N.

Couplers, Car
American Steel Foundries
Brill Co., The J. G.
Ohio Brass Co.
Westinghouse Tr. Br. Co.

Cranes, Electric, Industrial, Truck-Mounted
Baker-Raulang Co., The
Cranes, Hoists and Lifts
Buda Co., The
Electric Service Supplies Co.

Cross Arms (See Brackets)
Crossings
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Foundations
International Steel Tie Co.

Crossings, Frogs and Switches
Ramapo Ajax Corp.
Wm. Wharton Jr. & Co.

Crossings, Manganese
Bethlehem Steel Co.
Ramapo Ajax Corp.
Wm. Wharton, Jr. & Co.

Crossing Signals, (See Signal Systems, Highway Crossing)

Crossings, Track, (See Track, Special Work)

Crossings, Trolley
Ohio Brass Co.
Westinghouse E. & M. Co.

Curtains and Curtain Fixtures
Brill Co., The J. G.
Morton Mfg. Co.
Pantasote Co., Inc., The
Dealers' Machinery and Second-Hand Equipment
Electric Equipment Co.
Sachsenmaler Co., Geo.
Dealer Second-Hand Rails
Hyman-Michaels Co.

Derailing Switches
Ramapo Ajax Corp.

Destination Signs
Electric Service Supplies Co.

Detective Service
Wish Service, Edward P.

Door Operating Devices
Brill Co., The J. G.
Consolidated Car Heating Co.
National Pneu. Co. Inc.
Safety Car Devices Co.

Doors and Door Fixtures
Brill Co., The J. G.
General Electric Co.
Hale-Kilburn Co.
Morton Mfg. Co.

Doors, Folding Vestibule
National Pneumatic Co., Inc.
Safety Car Devices Co.

Drills, Track
American Steel & Wire Co.
Electric Service Supplies Co.
Ingersoll-Rand Co.
Ohio Brass Co.

Dryers, Sand
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse Elec. & Mfg. Co.

Ears
Electric Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.

Electric Grinders
Railway Track-work Co.

Electrical Wires and Cables
American Elec. Works
American Steel & Wire Co.
Roebing's Sons Co., J. A.

Electrodes, Carbon
Railway Track-work Co.

Una Welding & Bonding Co.
Electrodes, Steel
Railway Track-work Co.
Una Welding & Bonding Co.

Engineer Inspecting & Chemists
Pittsburgh Testing Laboratory

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Allison & Co., J. E.
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Beeler, John A.
Bibbins, J. Rowland
Buchanan & Layne
Day & Zimmerman, Inc.
Drum & Co., A. L.
Ford Bacon & Davis
Hemphill & Wells
Hol., Engelhardt W.
Jackson, Walter
Kelker & De Lew
Kelly Cooke & Co.
McClellan & Junkersfeld
Richey, Albert S.
Sanderson & Porter
Stevens & Wood, Inc.
Stone & Webster
White Eng. Corp., The J. G.

Engines, Gas, Oil and Steam
Ingersoll-Rand Co.
Westinghouse Elec. & M. Co.

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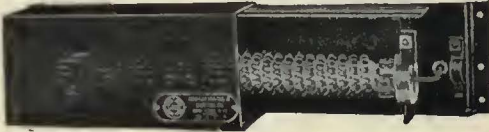
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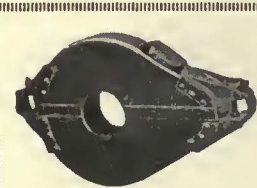
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Quick shipment and low prices also on cylinders, valves, torches, regulators and supplies.

International Oxygen Co., Main Offices: Newark, N. J.
Branches: New York Pittsburgh Toledo

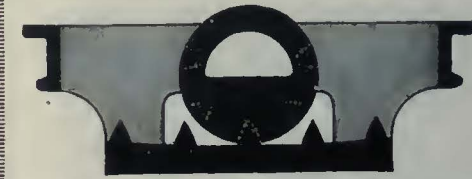


N-L Ventilators
for Cars and Buses



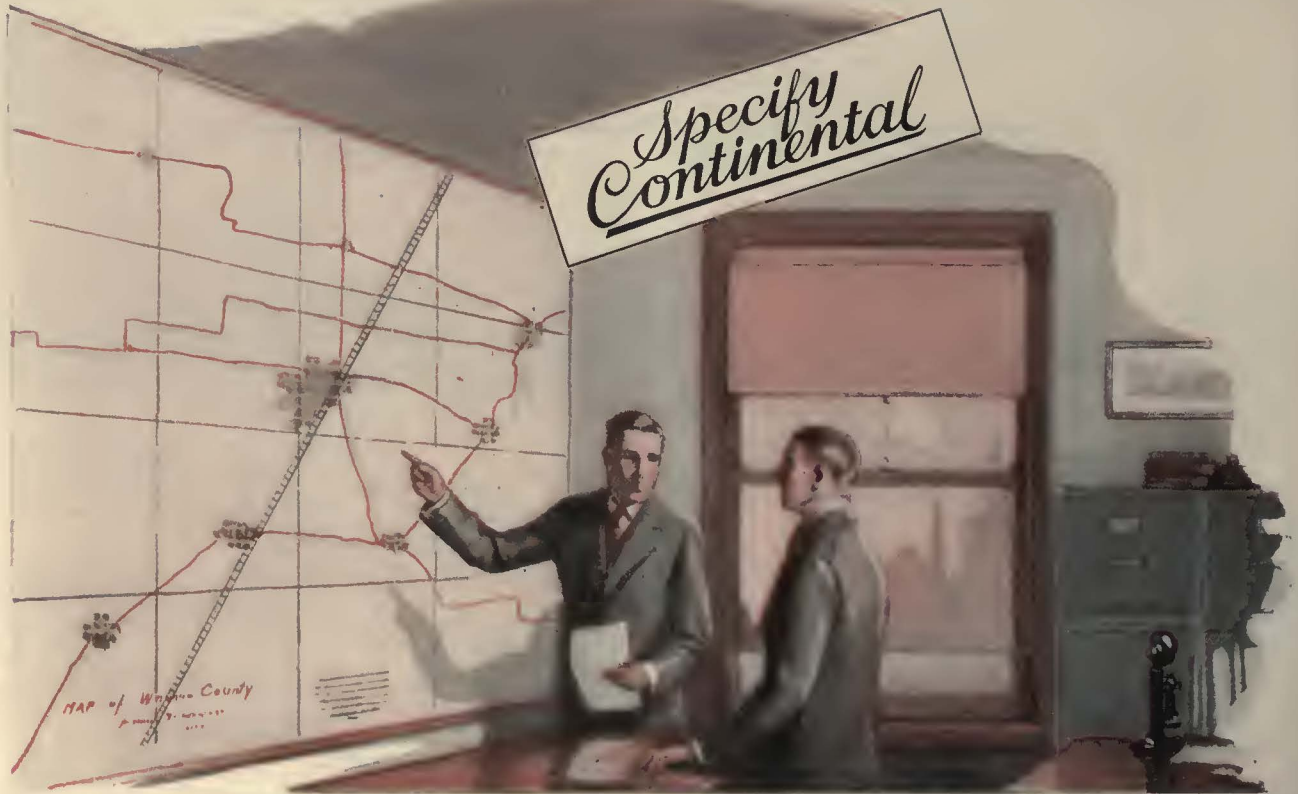
The Nichols-Lintern Co.
Cleveland, Ohio

ELECTRIC CAR HEATERS
THERMOSTATS BUZZERS
PNEUMATIC DOOR OPERATORS
CONSOLIDATED CAR HEATING CO.
NEW YORK ALBANY, N.Y. CHICAGO



STUCKI
SIDE
BEARINGS

A. STUCKI CO.
Oliver Bldg.
Pittsburgh, Pa.



The Best Way to Cover the Route

Getting the bus over the route and on time always, is a patronage builder which is reflected in growing profits.

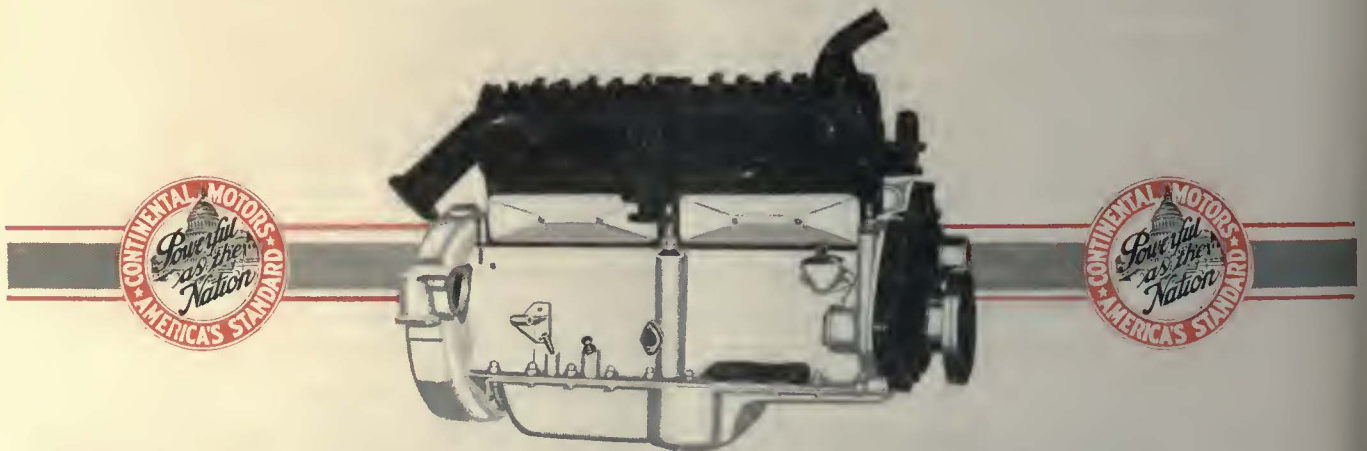
The operator who drives a bus equipped with a Continental Motor has at hand a flexibility of power which

easily responds to the level road or tortuous hill.

And the bus owner can know that through Continental power and dependability his busses will be able to consistently keep to the schedule and economically cover the route.

CONTINENTAL MOTORS CORPORATION

Offices: Detroit, Mich., U. S. A. Factories: Detroit and Muskegon
The Largest Exclusive Motor Manufacturer in the World



Continental Motors

Brill "Admor" Seat



Easily and quickly operated.

Increased Seating Capacity

Improved Public Relations

Adapted to both end and center platforms of cars equipped with either slat or upholstered seats.



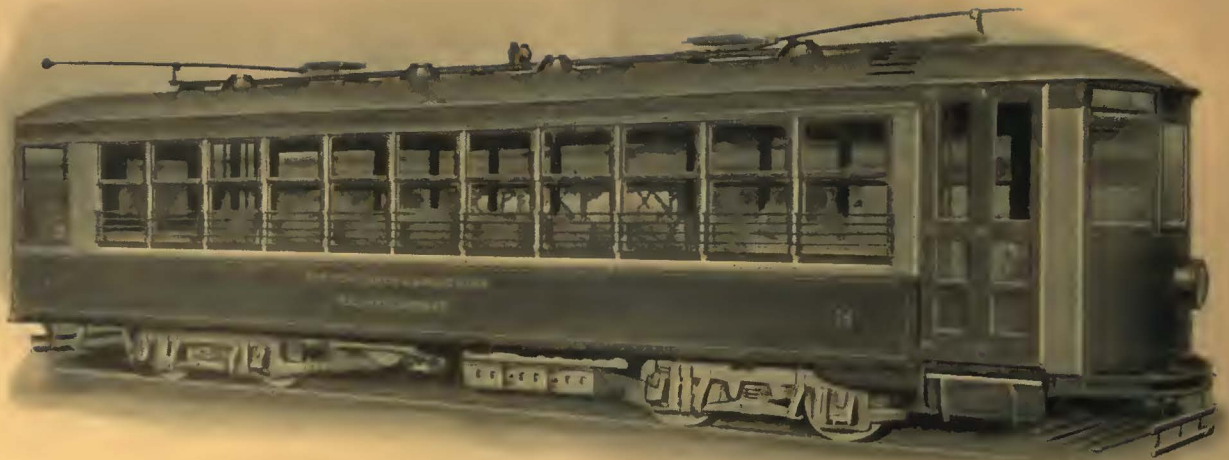
Separates incoming and outgoing passengers at service doors.

The Brill "Admor" Seat (patented) makes it possible to utilize the space in front of non-operating platform doors for additional seating accommodations. Brooklyn City Railroad with 535 cars equipped, Asheville Power & Light

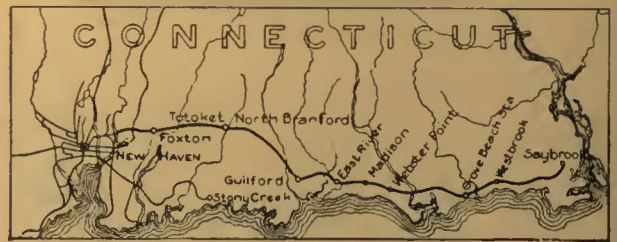
Company, City of Miami, The Washington Railway & Electric Co. on its 15 new cars, and the Chilean Electric Co. of Santiago on 30 cars now building have already taken advantage of its facilities. Further details furnished upon request.

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.



The modern car has demonstrated its increased earning power, even to bringing a shut-down property back to life. It is the railways' greatest asset.



Modern cars, one-man operated, have turned loss into profit for the New Haven & Shore Line

Operating costs per car-mile, 1924:

Maintenance of way and structures	2.27 cts.
Maintenance of equipment.....	2.04 cts.
Power (delivered to cars).....	4.89 cts.
Conducting transportation.....	5.24 cts.
General and miscellaneous	5.51 cts.
Total.....	19.95 cts.



The resources and the service of the entire G-E organization are available to consider the problems of modernization and co-ordination—to find the most effective means of transportation and recommend and build appropriate equipment to meet each particular requirement in any community.

Modern equipment used:

Motors (4-25 h.p.)	GE-264A
Control (double-end)	G-E type K-35
Air brakes	G-E with safety car control
Compressors	G-E type CP-27B

GENERAL ELECTRIC