

ELECTRIC RAILWAY JOURNAL



White
Model 53 Bus
14 to 21 passengers

Designed and Built to Give Most Money-earning Miles

YEAR after year The White Company strengthens its position of leadership as a manufacturer of high-grade motor busses. The company's experience as a bus maker, extending over a period of more than 20 years, is without a parallel for its scope and thoroughness.

Especially designed to meet the exacting requirements of passenger transportation, the White Model 50-B Bus, seating from 25 to 29 passengers, and the new small White Bus Model 53, seating from 14 to 21 passengers, afford the maximum of comfort and convenience to the riding public and the maximum of profit to the operator.

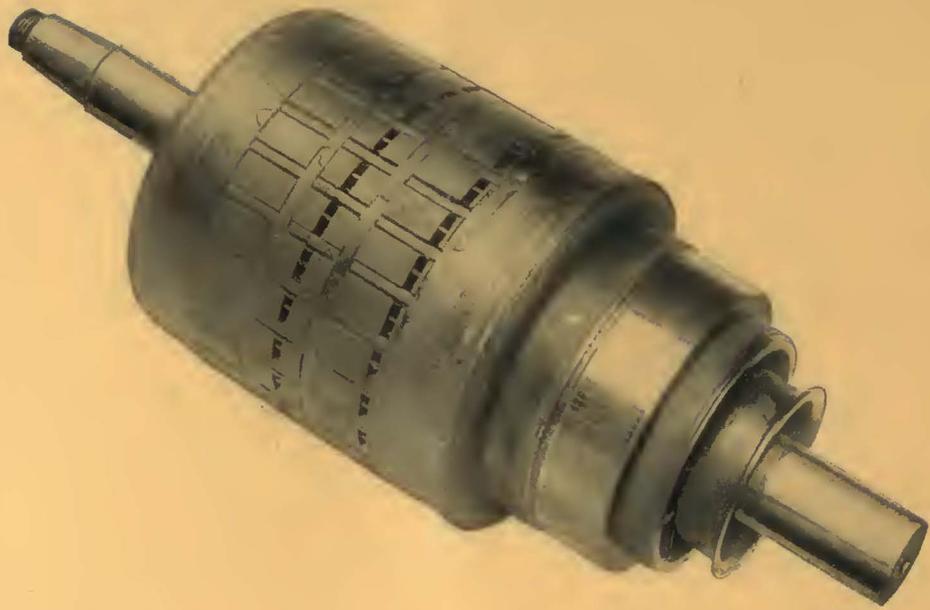
The White Model 53 Bus meets the need of bus operators for a small bus with White power, White reliability, White ruggedness and White safety and comfort for passengers.

Model 53, like all Whites, is built to stand up and to give reliable service at low cost over hundreds of thousands of miles. The chassis throughout is designed and built to meet the requirements of the small bus field. It will give you what the thousands of White operators have learned to expect of a White—the *most money-earning miles*.

THE WHITE COMPANY, *Cleveland*

WHITE BUSES

MADE RIGHT — SOLD RIGHT — KEPT RIGHT



Dipped and Baked

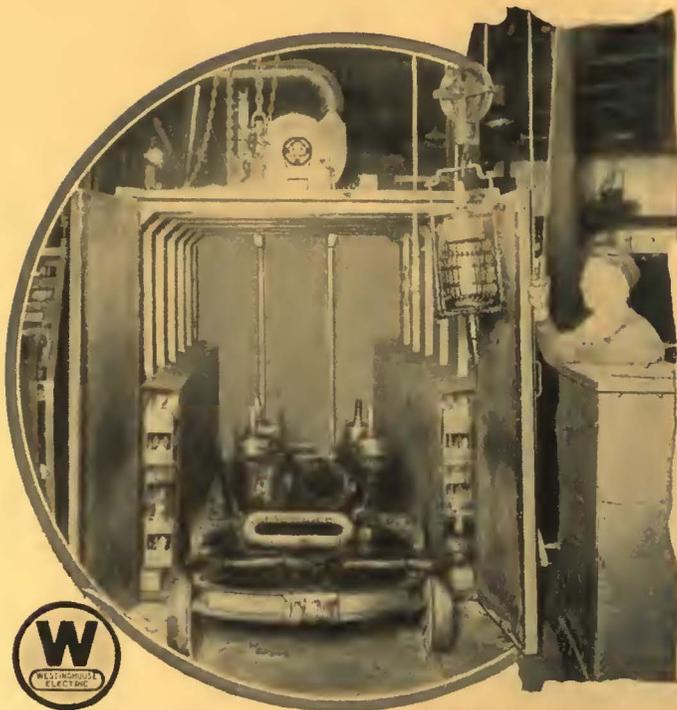
-75% More Service

INSULATING varnish, properly applied and baked, forms a hard, tough coating that is moisture- and dust-proof. The varnish fills all cracks and crevices, holds loose coils and laminations in place, and restores damaged insulation to good condition.

The proper baking of insulating varnish requires dry heat, close temperature control, uniform temperature all over the oven, and ventilation. All these conditions are best met with electric heat.

Westinghouse electric ovens for baking armatures are described in Leaflet 1819-A. A copy will be mailed to you at your request.

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



1926

Westinghouse

Electric-Armature Baking Ovens

X88718

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"Covering" an Industry

SOME of the romance of making the service of McGraw-Hill papers complete to their respective industries is dramatized in the advertisement on pages 27-A and 27-B of this issue, which is one of a series that is being run in prominent newspapers of the country.

Across a hundred miles of desert for a single subscription!

To the readers of ELECTRIC RAILWAY JOURNAL this kind of subscription work has a peculiar significance. It results in establishing through the pages of the paper a contact between all the elements in the industry more complete than that of any existing agency.

Circulation is built on what is known as a "unit coverage" basis. Each operating property is considered as a unit. One or more paid subscriptions to the JOURNAL from every active electric railway is the objective of the circulation department.

McGraw-Hill circulation men travel 500,000 miles a year to maintain this complete contact. They are located in every state in the Union. Should subscriptions on an individual railway inadvertently be allowed to lapse, up goes a red tack on a master map at headquarters in New York—and that tack blazes its message until the subscription is renewed. The ELECTRIC RAILWAY JOURNAL map shows that 98 per cent of the active operating mileage of the country is included in the properties that receive the JOURNAL every week.

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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

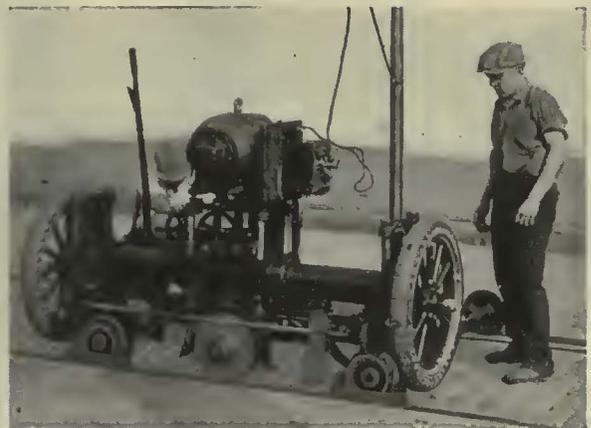
SAVING THE RAIL SAVES THE RAILWAY

Never a truer word:

“It is due entirely to the fact that most companies have allowed their standards of maintenance to fall to low levels that cars go rattling along on poorly maintained tracks. It is up to those interested each year to spend more effort and money on bettering the conditions of cars and tracks. These results will soon repay all moneys wisely spent.”



“Improved Atlas” Rail Grinder



“Imperial” Track Grinder

Thus wrote Mr. A. T. Clark, Supt. Rolling Stock and Shops, United Railways & Electric Company of Baltimore.

No word that we could add would further emphasize the need for efficient track maintenance equipment.



Reciprocating Track Grinder

We offer it.

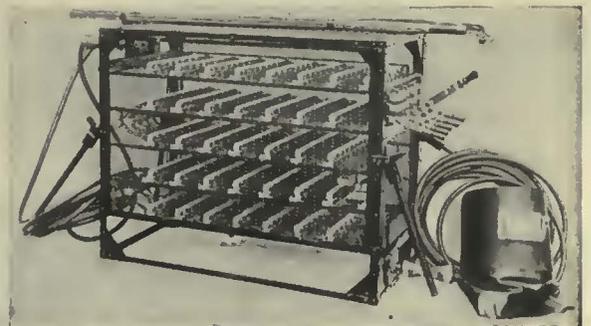
Railway Trackwork Co.

3132-48 East Thompson Street, Philadelphia

AGENTS:

- Chester F. Gailor, 30 Church St., New York
- Chas. N. Wood Co., Boston
- Electrical Engineering & Mfg. Co., Pittsburgh
- H. F. McDermott, 208 S. La Salle St, Chicago
- P. W. Wood Railway Supply Co., New Orleans, La.
- Equipment & Engineering Co., London
- Frazar & Co., Japan.

1041



“Ajax” Electric Arc Welder

SAVING THE RAIL SAVES THE RAILWAY

*International Creosoted Pine Poles
in Signal Service on the Big Four.*

**Great
Permanent Strength**

—is the outstanding feature of Creosoted Yellow Pine Poles. It insures long life, low annual cost, trouble-free operation and negligible maintenance and replacements.

Specifying *International* Poles gives assurance of quality—sound timber and scientific treatment under rigid chemical control.

International poles, time tested by more than 25 years of service are in use from coast to coast.

International Creosoting & Construction Co.
General Offices—Galveston, Texas

International

Creosoted Yellow Pine Poles



**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

Noise reduction



H. S. Williams, Assistant Superintendent of Equipment of the Department of Street Railways, City of Detroit. Mr. Williams is an authority on problems related to noise reduction, and is Chairman of the Noise Reduction Committee of the American Electric Railway Engineering Association.

now being given serious consideration

"SOMETHING must be done to dampen the vibrations set up in the track rails if we are to go the limit in our efforts to reduce the noise in car operation."

That is the opinion recently expressed by H. S. Williams of the Detroit Street Railways. And as he is Chairman of the Noise Reduction Committee of the American Electric Railway Engineering Association, Mr. Williams speaks with the voice of authority.

Elaborating on his point of view, Mr. Williams continued, "This problem did not exist in old-time construction on wood ties. But modern rigid construction possesses such characteristics as to make it exceedingly noisy when cars pass over it.

"As this type of construction is required for economic reasons, it becomes necessary to modify it to such an

extent that it shall not be objectionably noisy. Otherwise, there will be such a racket within the cars as to drive away passengers, and also to cause serious protest from residents of adjacent property."

The marked reduction in noise is always commented on following the installation of Carey Elastite System of Track Insulation.

The Carey System also lessens pavement failure in the track zone because it keeps out water and frost, and takes

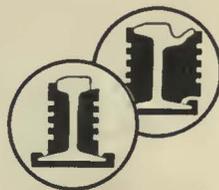
up expansion stresses. Engineers are finding, too, that it greatly prolongs the life of track and pavement.

Write for complete information.

The Carey Elastite System of Track Insulation consists of a preformed asphaltic compound which forms a resilient cushion between the rail and the pavement. Made to fit any rail section. A tap with a mallet sets the strips in place. Entirely unaffected by moisture or changes in temperature.

THE PHILIP CAREY COMPANY
Lockland, Cincinnati, Ohio

**Carey
Elastite**
REG. U.S. PAT. OFF.
TRADE MARK REGD. U.S. PATENT OFFICE



SYSTEM OF
TRACK INSULATION



Goodyear Balloon Tires for Motorbuses

The nine successful and well-known operators listed in the panel below are among the bus owners now using Goodyear Balloon Tires.

Their common experience is that these tires not only provide the last word in smooth and easy riding qualities, but also result in very definite economies.

They save money on upkeep and breakage, effecting material reductions especially in spring breakage.

They develop maximum tractive power in any going, steer easily, and yield unusually long, trouble-free mileage at low tire cost per mile.

Goodyear Balloon Tires for Motorbuses are the final development of Goodyear Pneumatic Bus Tires. Their rugged, active cushioning qualities represent the peak of that development which has accompanied every progressive move of motorbus transportation.

Made with SUPERTWIST, the extra-durable, extra-elastic fabric which Goodyear developed especially for the low-pressure tire, Goodyear Balloon Tires demonstrate in motor-



Goodyear Balloon Bus Tire
Made with Supertwist

bus service the superior stamina and finer riding qualities which SUPERTWIST alone provides.

If you want to give your patrons not only a very convenient and economical service, but one that also is superlative from every standpoint of luxurious comfort, equip

with Goodyear Balloon Bus Tires made with SUPERTWIST. They are better balloons, yet they cost you no more.

**LARGE OPERATORS USING
GOODYEAR BALLOON BUS TIRES**

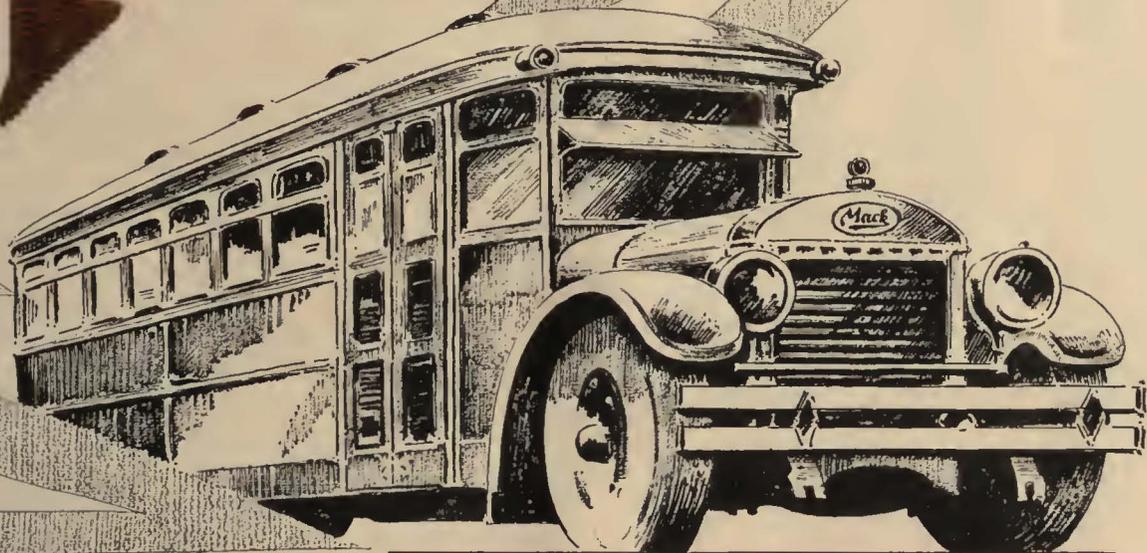
- | | |
|---------------------------------|---------------------|
| Boston Elevated Ry. | Boston, Mass. |
| Capitol Traction Co. | Washington, D. C. |
| Colonial Motor Coach | Watertown, N. Y. |
| Detroit Motorbus Co. | Detroit, Mich. |
| Kansas City Railway Co. | Kansas City, Mo. |
| Motor Transit Co. | Los Angeles, Calif. |
| Northern Ohio Power & Light Co. | Akron, Ohio |
| Northland Transportation Co. | Minneapolis, Minn. |
| T. M. E. R. & L. Co. | Milwaukee, Wis. |

For every Goodyear Cord Bus Tire there is an equally fine Goodyear Tube, built especially to the needs of bus service



Mack

GAS-ELECTRIC



Engineering
Leadership
again evident in the
Mack
Gas-Electric
One-Motor Bus



Mack

GAS-ELECTRIC

Again Mack steps to the fore with

Always progressive, Mack steps to the fore with a Gas-Electric One-Motor-Bus which answers the question, "*Which is the right drive, one or two motors?*"

Mack uses one motor because one motor does the job with less weight and with less units to take care of, thus eliminating extra maintenance and costs. At the same time Mack retains the standard Mack rear axle, single propeller shaft and the many other

exclusive features which have identified Mack with successful *performance*. You get a bus that is completely Mack design throughout, plus perfected gas-electric features that mean greater economy.

For instance, only Mack can take up the inertia of the generator and armature as Mack does it, for only Mack uses a Rubber Torsion insulator, developed after long experience with Rubber Shock Insulators—another Mack exclusive feature.

And Mack careful engineering provides for the installation of the motor entirely below the flooring. No special housing protrudes above the floor and encroaches upon valuable space. Due to the chassis construction and mountings of the motor none of the ground clearance of the bus is lost. In the



The first bus was a Mack
the first Mack was a bus

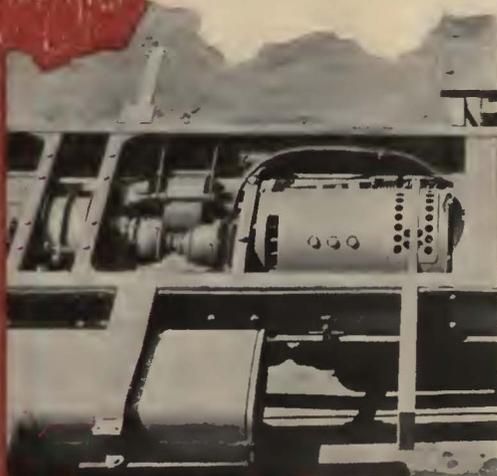
TRIC

- one motor drive

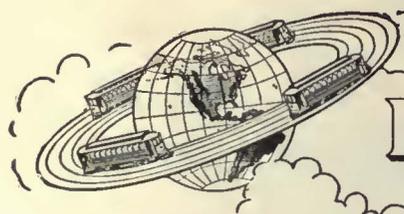
THE RIGHT DRIVE- ONE MOTOR

Mack Gas-Electric, the clearance is $9\frac{1}{2}$ inches, identical with that in the standard bus. Operating experience has demonstrated that in hard going through mounds of slush the Mack high clearance kept the motors out of the wet and in commission when other transportation units failed to maintain schedules—a performance typical of Mack.

If you value simplicity, quick acceleration, smoothness and ease of operation incorporated in a design that assures the greatest economy in cost of maintenance you will find the answer in the Mack Gas-Electric One-Motor-Bus—perfected by Mack engineers under actual operating conditions and released only after positive knowledge that Mack's reputation for performance will not only be supported, but strengthened.



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

Look good for another 10,000 after running almost 50,000 miles

Acme Coach Line
Cadillac, Michigan

Feb. 15th, 1926.

Kelly-Springfield Tire Co.,
5900 Cass Ave.,
Detroit, Mich.

Gentlemen:-

Our Acme Bus has been driven 48,995 miles over heavy, rough gravel roads M-13 from Traverse City to Howard City and the two 34x7 Kelly-Springfield tires in front have gone the entire distance, one has never had the air out of it.

These tires look like they are good for 10,000 miles more and I wish to congratulate your Company on building such a wonderful tire which can stand such hard road usage. Our average road speed is about 26 miles per hour.

Enclosed find picture, in which you will notice the excellent condition these tires are still in. We have Kelly-Springfield 36x8 in the rear and they have proven very satisfactory.

Very truly yours,
- ACME COACH LINE -
Propr.

L. B. Donnelly

D-J

THE experience of bus operators with Kelly Heavy-Duty Cords tells the story of greater mileage and lowered operating costs better and more convincingly than anything we ourselves might write. Kellys give good service to large and small operators alike, and increase their profits by cutting costs.

Kelly-Springfield Tire Co.
250 West 57th Street, New York, N. Y.

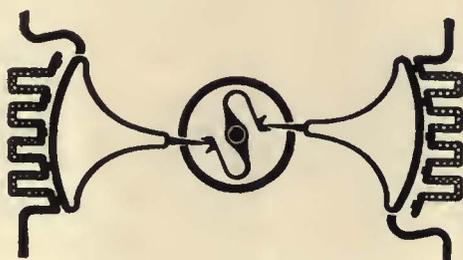


KELLY HEAVY DUTY CORD

IN THE POWER STATION

American Brown

Boveri Power Regulator



FULL automatic regulation as secured by Brown Boveri regulators means complete proportioned equalization of currents in all machines in parallel without any attention on the part of the operator. It means the machine is started, synchronized, and fully loaded on regulation. It means the quiet and stable regulation of machines having entirely different characteristics giving each one its most economic point of saturation. It means cross currents kept to a minimum.

A total of 20,000 machines are now operating under these advantages. These devices will provide for the maintenance of constant voltage current, speed, power or power-factor.

The outline diagram at the top of this page is the symbol of Brown Boveri regulation and includes these three closely related instruments:

Automatic Quick-acting Voltage Regulator.

Automatic Current-limiting Regulator.

Automatic Synchronizer.



PRINCIPAL PRODUCTS OF AMERICAN BROWN BOVERI ELECTRIC CORPORATION

*Electric Locomotives
for any system of current, high or
low, tensions
Complete Equipment
for railway electrification
Mercury-Arc Power Rectifiers
(steel enclosed)
Diesel-Electric Locomotives
Mining Locomotives
Motors (all sizes and types)*

*Rotary Converters
Motor Generators
Transformers (power or current)
Switches, Controllers
and all Auxiliary Equipment
Oil Switches
Condensers and Auxiliaries
Steam Turbo Generators
for normal or high pressures and
superheats*

*Automatic Regulators
Relays
Turbo Compressors and Blowers
Electric Furnaces
Induction Regulators
Ships
Diesel Driven
Turbine Driven
Electrically Driven
Structural Steel Fabrication*

IN THE SUB STATION

American Brown Boveri Steel Enclosed Rectifier



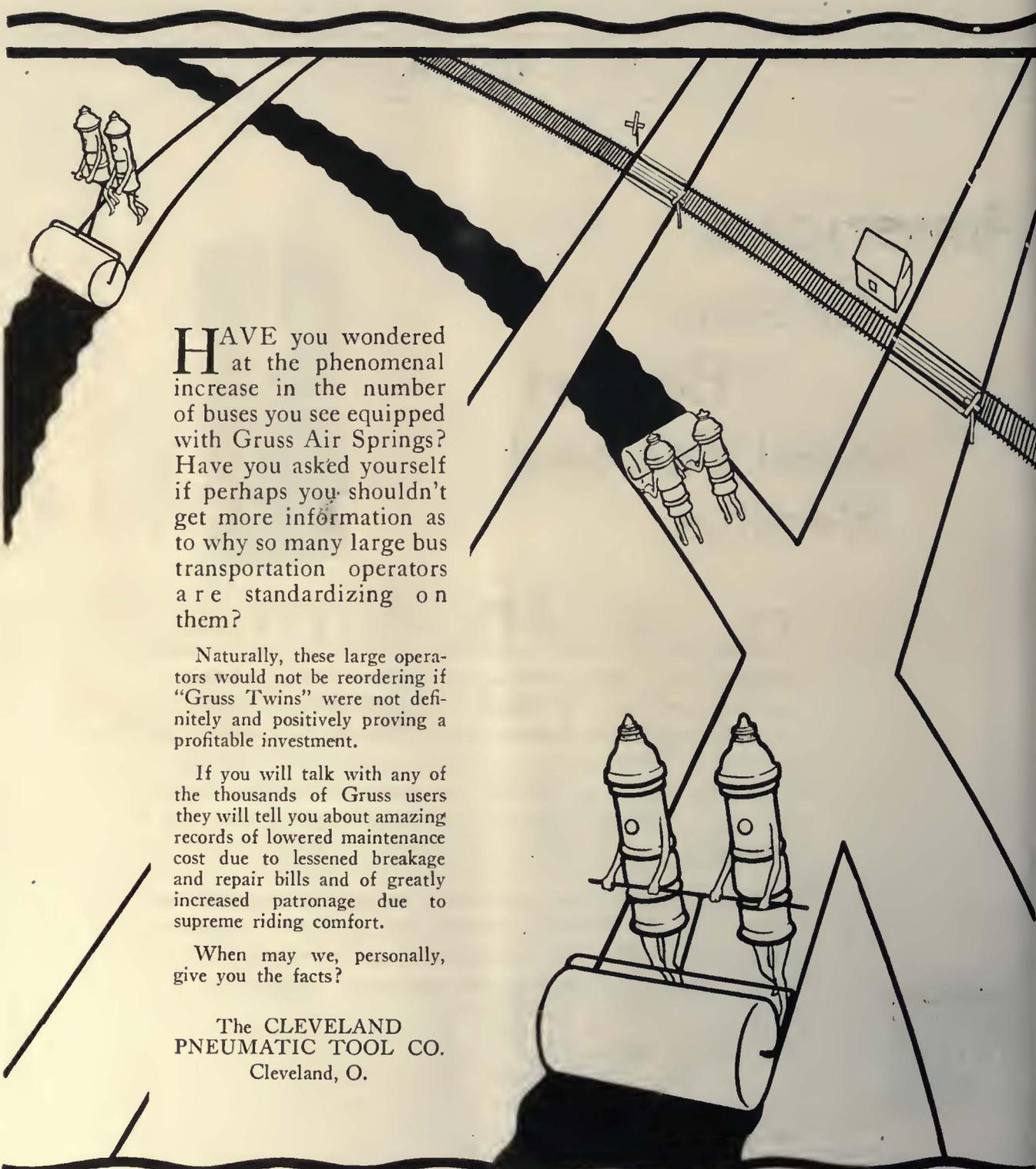
THE meaning of the word "Power" in the term—
Mercury-Arc Power Rectifier refers to large steel enclosed units that perform the same service as rotary converters or motor-generators not only more efficiently, but with several other advantages. While the basic principle is identical with the familiar mercury-arc glass enclosed rectifier for house lighting voltages, the high duty (reaching 3000 KW.), which it performs requires entirely different construction and operating details.

Advantages include high efficiency over wide load-variation, absence of the inherent drawbacks of heavy rotating parts, absence of need for synchronizing, very little attendance, absence of hum and vibration and adaptability to automatic control.



AMERICAN
BROWN BOVERI
Electric Corporation

Plants: Camden, N. J. Main Office: 165 Broadway, New York



HAVE you wondered at the phenomenal increase in the number of buses you see equipped with Gruss Air Springs? Have you asked yourself if perhaps you shouldn't get more information as to why so many large bus transportation operators are standardizing on them?

Naturally, these large operators would not be reordering if "Gruss Twins" were not definitely and positively proving a profitable investment.

If you will talk with any of the thousands of Gruss users they will tell you about amazing records of lowered maintenance cost due to lessened breakage and repair bills and of greatly increased patronage due to supreme riding comfort.

When may we, personally, give you the facts?

The CLEVELAND
PNEUMATIC TOOL CO.
Cleveland, O.

GRUSS AIR SPRINGS

*for Trucks, Buses
Passenger Cars ~*



TIMKEN *Tapered Roller* BEARINGS



38 Timkens to Carry Shock

"Mechanical efficiency is further increased," says the Smalley Rail-Car Company, of Davenport, Iowa, ". . . . by 38 Timken Bearings to carry shock loads."

Smalley uses 16 Timkens in the truck journals, 10 in the transmission, 8 in the final drive, 2 in the gear box, and 2 in the bell trunnions. If there ever was an all-around test of every characteristic of a bearing, this is it!

And every test shows smoothest starting, remarkable acceleration, and great speed possibilities, even on grade with trailer.

Yet operating economy is very high because Timkens kill the excess friction which otherwise wastes fuel and grease. Maintenance is also cut by extreme endurance due to Timken-made steel and the inherently greater load area of Timkens.

Favorably affecting initial cost as well, by simplifying car design, Timken Tapered Roller Bearings have been adopted almost universally, by the great rail car manufacturers.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO



A good Rewind —as good as the original job

Ready-cut insulations and properly fitting armature coils are essential if you wish to make rewound armatures as good as new.

These insulations are supplied in convenient packages, one set to a package. Each set contains not only just enough material, but all cut for your winder so he need waste no material —nor spend time in cutting and fitting.

Most important of all is the *original equipment quality* of standard packaged insulations, ready-cut for G-E Motors. These can be supplied only by General Electric.



Nothing has added so much to the quality, and to the economy, of armature rewinding in recent years as G-E Ready-cut Insulations. It will pay you to standardize on their use and stock them as you do armature coils.



For

Original Equipment Quality

GENERAL ELECTRIC

Electric Railway Journal

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

Published by McGraw-Hill Publishing Company, Inc.

CHARLES GORDON, *Editor*

Volume 67

New York, Saturday, May 29, 1926

Number 22

Car Design Gets a Forward Impetus

PRINCIPAL features of the new cars developed by Grand Rapids are presented elsewhere in this issue. These are the outgrowth of the ideas incorporated in three sample cars submitted by competitive builders last spring. The cars which are being delivered include what were considered the best elements of the sample cars.

In this effort to stimulate the improvement of cars, Grand Rapids has rendered a notable service to the industry. Mr. DeLamarter believes that street cars can be made attractive to passengers and a credit to the city in which they are operated. There is unmistakable evidence in these latest cars of the possibilities in this direction.

Neither Mr. DeLamarter nor the JOURNAL believes that they represent the ultimate in design. Development of the automobile did not take place in a single model or in the mind of any one individual. It has been the result of collective thinking and collective experience. Primary significance attaches to the Grand Rapids cars not as an ultimate design but as a definite step beyond the bounds of precedent. If the net result is merely to stimulate a more general effort to improve the street car as a transportation merchandising agency Mr. DeLamarter's strenuous efforts in the face of many obstacles and some skepticism will prove of invaluable service to the industry.

British Transport Workers

Find They Are Not Indispensable

DOGGED determination to see it through at whatever cost of personal comfort and convenience enabled the British public to win a real victory in the recent general strike. Rudyard Kipling, who has put the psychology of his fellow countrymen into words as few other writers ever have done, tells:

How in all time of our distress
And our deliverance too,
The game is more than the player of the game
And the ship is more than the crew.

Although written years ago, these lines epitomize exactly the spirit that broke the general strike. It was the realization that "the ship is more than the crew" that impelled Tom, Dick and Harry to keep the wheels turning when the regular workers quit.

At this distance, it is impossible to evaluate accurately the merits of the controversy between the British coal miners and the mine owners; nevertheless, it is sufficiently clear that the attempt to paralyze the life of the nation by calling a general strike, including public service employees, was not the way to settle the coal question. Grave fears were entertained in many well-informed quarters, however, that this effort might succeed to the point of forcing some concession from

the government. But the trades union officials apparently misjudged the temper of the British public. The ordinary, easy-going citizen got mad and upset the plans of the labor leaders.

Volunteer workers were instrumental in restoring the transportation services promptly, as told in a news article from the London correspondent of ELECTRIC RAILWAY JOURNAL, and published elsewhere in this issue. While these volunteers undertook to operate to some extent the tramways rapid transit lines, and steam railroads, it was in the field of bus operation that they were most successful. A large part of the London traffic normally is carried by bus, and it was found possible by the combined efforts of the independents and experienced automobile drivers hastily converted into bus drivers, to provide a surprisingly effective transportation service. Private motor cars also carried many thousands of people. Conditions generally similar to those in London prevailed also in the smaller cities.

Thus the British transport workers discovered that they were not indispensable. The public, greatly irritated by the attitude of the unions, determined to break the general strike and found they could do it. The experiment and its outcome taught a lesson that will long be remembered.

Failure of Interstate Bus Lines

Points to Need of Regulation

LACK of interstate bus regulation has encouraged operators in many instances to undertake a type of service which the bus is not fitted to perform. Recent developments in the field of New York-New Jersey operation furnish convincing evidence of this. Traffic checks show only 24 lines now in operation, carrying some 6,000 passengers a day, as compared with 30 lines carrying about 9,000 daily passengers a month ago. Altogether nearly half the routes that were in operation at one time or another have been discontinued.

Suspension of service on these bus lines is due to their failure to attract as much patronage as was expected. The total volume of interstate traffic in this territory is enough to support many times the number of buses which have been engaged in such operation. The bus service, however, has been not only less regular than the rail service but also considerably more expensive. The slow crossing of the Hudson River on ferryboats crowded with other vehicles has been a serious obstacle to successful operation. Traffic congestion in New York City has been another difficulty.

On account of these conditions only a small part of the rail traffic has been taken away—not enough to support the hundreds of buses which rushed into the business. The weaker operators have been forced to the wall, and in a number of instances the dealers have replevined the buses for failure to make purchase payments. Many operators still continue, and in some

cases probably are filling a real transportation need. By providing through service without change of vehicle from certain suburban communities to the shopping district of New York City the buses supply a type of transportation which the rail carriers cannot offer. The extent of the demand for such service at the price which must be charged for it is problematical. Judging by the present trend of events it appears that the peak of this kind of operation has passed.

However, it would be a grave mistake to assume that because there has been some improvement in this particular situation the whole problem will work itself out satisfactorily without official regulation. In the North Jersey area the rail carriers are in a strong position and have not been seriously affected by the competition. This is not true in every locality where interstate bus operation has been undertaken, and protection of the rail carriers is undoubtedly necessary in many cases. Moreover, needless duplication of facilities is bound eventually to increase the price of transportation and proper regulation is needed to protect the interest of the public in this regard. Responsible bus operators themselves would profit from regulation, which would prevent overcrowding of those routes where an opportunity exists to furnish service that is really needed. From every point of view the sooner that proper regulation is secured the better it will be for everybody.

Amateur Engineering Is Dangerous as a Basis for Spending \$4,000,000

CALLING the report of Seattle's Rapid Transit Committee a layman's report is perhaps the kindest thing that can be said. It is a noble effort but fraught with the pitfalls that lie in the wake of such attempts on the part of the uninitiated in technical matters. The "findings and recommendations" included in this report to the City Planning Commission are abstracted elsewhere in this issue.

Seattle has had a hard time with its transportation. Its surface lines were dragged down for years by political barterers while under Stone & Webster management, and now as a municipal proposition it has been almost sunk to oblivion. Costs have mounted under city management and revenues have steadily decreased. Now a new idea develops. Because the municipal operation has failed, as is maintained in the report, the committee finds that a combination subway-elevated system of rapid transit is necessary.

No brief is held by this paper for or against the necessity of such a system, but the methods of arriving at the conclusion in the report in favor of it, founded on the variegated and somewhat heterogeneous nature of the material, would lead one to doubt the value of the findings, whether they were for or against the object of the investigation. Certainly the finding by the committee that a rapid transit scheme was desirable because of the advertising value to the city will make cold beads of perspiration stand out on the brows of those who have lived through the early financing of some existing operations.

The industry has trouble enough to solve the problems confronting it, even with the use of the best talent available, without being embarrassed with projects that liken themselves to the old stanza, "I shot an arrow in the air, it fell to earth I know not where." The report is colored with quotations from men well known in the industry, such as Frank Sprague, Roger W. Babson,

John Beeler and Edward W. Bemis. None of these men has reported on the Seattle situation, but the quotations and comparisons are drawn from public reports or testimony given in connection with investigations in other cities or from correspondence. Such scattered statements are interpreted in the report to have a bearing on the Seattle situation.

Probably the committee was vested with the authority to make a report without being allowed an appropriation for the work involved. If this be the case, more respect would have been forthcoming if the committee had recommended that an engineering investigation be made rather than produce the superficial report that, wrongly used, may cause incalculable harm.

Neither Seattle nor the industry can afford amateur play with its transportation.

Present Expediency May Endanger the Future

NEWS of the consummation by the Fifth Avenue Coach Company of an agreement to buy the New York Railways as a step in bringing about the establishment of a comprehensive bus system in Manhattan has again aroused general interest in the popular subject of bus versus street car in that city.

There are some phases of this latest move that may well be given attention by local transportation men in other cities, in order that the facts and the conditions surrounding the New York developments may be properly interpreted and in order that the wholesale drawing of general conclusions from a most specialized set of premises may be avoided.

It may be well to reiterate here that ELECTRIC RAILWAY JOURNAL is a hearty advocate of the bus as a valuable transportation tool. It is interested primarily in the development of the local transportation industry and has no fetish of sentiment or precedent in favor of any one vehicle over another. It believes that the bus makes possible a broader field for common carrier passenger business instead of foreshadowing the passing of the street car as a mass transportation agency; that the successful exploitation of this broadened field depends on the establishment with the bus of a higher grade form of common carrier transportation at proportionately higher rates of fare.

One outstanding fact characterizes all of the various proposals to substitute buses for cars in New York. There is in the whole situation a primary motive of expediency. Some of the trolley lines which it has been proposed to remove have proved unprofitable. Others have been more or less profitable. But the significant fact is that these results have been obtained under conditions peculiar to operation in New York. These have been both political and physical. Under the former classification falls the 5-cent fare; under the latter is the expensive conduit slot contact system which the railways in Manhattan are required to use. There is also no apparent effort in New York through traffic regulations to expedite movement of street cars.

In the sense that the proposal to substitute buses for certain rail lines offers a means of surmounting these obstacles which have retarded transportation improvement in Manhattan for years, the proposal may prove to be a wise one. But in the sense that it makes of the bus a mass transportation vehicle rather than a preferred service vehicle it is open to question. Worthy of note in this connection is the fact that there is no intimation in any of the various proposals which

have been made of any inclination by the Fifth Avenue Coach Company to modify in any respect the conditions or character of service which it now renders. Its present operations are not pooled in a city-wide system with the lines it proposes to establish.

At present the Fifth Avenue system offers "a seat per passenger service" at a flat 10-cent fare. But there is some basis for considering that such service has been made possible only by virtue of the existence of other mass transportation agencies to take the overflow of those who cannot obtain a seat, and which give service of a grade lower than a seat per passenger standard at half the bus fare. Wholesale substitution of buses for cars involves use of the bus for this base service which by its existence makes possible maintenance of the present high standard on Fifth Avenue. Installation of buses as merely street cars on rubber tires tends to load on their operation the public and political pressure for minimum fare and, by leading the public to consider buses as mass transportation vehicles, sets up in the public mind a standard of bus service that may prove a serious obstacle to the establishment of preferred forms of service at relatively high rates of fare. Since it is in this latter field that the bus appears to offer greatest prospect of development, the temptation for enthusiasts to aspire to street car replacement with buses seems an opportunist policy that may prove expensive to both the public and future bus operator.

Building Traffic Plans Around Mass Transportation

PLANNING street car and bus lines without paying attention to vehicle traffic in general is futile. The growth in number of trucks and automobiles in the past few years has been so great that it is almost beyond comprehension. As an example, in Baltimore the number of automobiles registered increased from 44,500 in 1922 to 81,400 in 1925, as shown by figures in the report of the engineers to the Traffic Survey Commission. Use of these vehicles in the same period is indicated by cordon counts taken around the business district. These show 117,000 vehicle movements in 1922 and 176,000 in 1925. If roadway space permits, the number of vehicle movements will be 308,000 in 1930 and 386,000 in 1940, the engineers estimate.

Here is a problem that transcends almost everything else concerned with the movement of public vehicles. Unless steps to provide for the situation are taken at once, a crisis will arise in the not very distant future that will paralyze all existing forms of transport. And similar congestion is the rule rather than the exception in American cities, large or small.

Vehicle traffic cannot be legislated off the streets. It has become part and parcel of our civic development. So it is necessary to make provision for accommodating it in such manner that it will interfere with public transportation agencies as little as possible. One way of doing this, as proposed in the Baltimore report, is the creation of a system of major traffic streets so located as to reduce to a minimum needless movements through the business district.

But whatever the solution, the railway man should be in the van when it is being worked out. It is to the advantage of the city to have mass transportation provided first of all, and individual transportation built around it. For only in this way will the best interests of business and industry be served.

Humanizing Modern Industry

SOME men there are whose prominence in the industrial world lends a deep significance to their every utterance. But Owen D. Young, chairman of the board of the General Electric Company, is a national and international figure whose service to modern society has surpassed the limits of mere industrialism. Consequently his recent advocacy of a "cultural wage" before the National Industrial Conference Board at its tenth anniversary meeting in the Hotel Astor, New York, on May 20, may be a powerful influence in broadening the industrial conception of social economics.

Mr. Young defined the cultural wage as one that would enable the individual to develop his intellect and profit through the opportunities afforded by the resources and wealth of the country. The payment of this wage, he said, will not make industry less profitable. On the contrary, he believes that the assumption by industry of a leading rôle in the development of the social, as well as the physical and economic, sciences will tend to correct the tendency toward overmechanizing which results from modern production methods.

The old arguments for the bettering of labor's lot were limited to a plane of mere materialism. Yesterday the talk all centered about the so-called living wage. While sociologists never have come to full agreement as to just what constitutes a living wage, nevertheless it is apparent that the earning capacity of the individual has increased many times over with the ever more efficient production systems of the past decade and a half. But that increased earning capacity has come at the cost of submerged individuality; standardization of every process, no matter how minute, until today there has arisen the danger that the man will be completely overshadowed by the machine; will become, in fact, a mere "Robot."

Mr. Young and other far-seeing executives decry this trend. They believe that the individual, who, after all, is the ultimate consumer, must be safeguarded from mental stagnation; must be encouraged and aided in his blind gropings toward self-expression. But considering the intangibility of the term living wage, it becomes evident that the desirability of a margin in the worker's income above the mere necessities of American living standards is much more evident than the method of determining what that margin should be. Furthermore, the mere paying of a cultural wage will not insure that the working classes will immediately acquire culture, any more than the mere exposing of a youth to a college education is proof positive that he is from that time forth and forevermore educated. To the mass of workers, left unguided in the effective use of an increased stipend, it would mean only a more impressive automobile or a more costly radio set.

To hit upon some means of exercising a wise and kindly guidance in this direction which will not reek of offensive paternalism will present to Mr. Young and others of the same high caliber of executive leadership a task of no mean proportions. His recent statement may be taken as indicative of the changing attitude of progressive American industry today. There may be here that broader groundwork for industrial peace that is sought not only in America but throughout the world. To build on it an economic structure for bringing this desired condition of more universal culture into the realm of actuality needs deeper and broader thinking than has characterized industrial relations in the past.

New Cars for Grand Rapids Being Delivered



An effort to incorporate beauty and smoothness of line into car design was made in the new Grand Rapids cars. Horizontal bands of color are carried continuously across the doors.

Effort to Popularize Street Car Service Results in Cars Designed to Compete with Other Forms of Transportation in Attractiveness, Comfort and Quietness of Operation—Developed from Three Competitive Designs Submitted Last Spring

DELIVERY of the first of a group of 27 new cars built for the Grand Rapids Railway by the St. Louis Car Company has just been made. These cars, details of which were worked out by the car builder under the direction of L. J. DeLamarter, vice-president and general manager Grand Rapids Railway, include what were considered the best features of the three sample cars submitted by competitive builders last spring and described in *ELECTRIC RAILWAY JOURNAL* of May 9, May 16 and May 23, 1926. Various features of the cars as now built were decided upon after exhaustive study of the three sample cars in an effort to learn the preferences of the riding public of Grand Rapids.

STREAMLINE EFFECT SOUGHT

Of outstanding interest to the electric railway industry is the attempt which has been made to improve the lines and appearance of the cars so as to make them attractive to the eye and a pride of the city in which they are to be operated. At the same time the interior has been given particular attention for the purpose of making a street car ride as comfortable as the limitations in the rate of fare charged will permit. It has been the opinion of Mr. DeLamarter that street car designers have an inherent advantage, both in the matter of dimensions and general structural limitations, over the automotive designer in providing a comfortable ride at minimum cost. This was one of the motives

back of the effort to build an improved type of car for Grand Rapids. To emphasize the character of service offered with these cars the management will refer to them as electric rail coaches rather than street cars. The results which have been obtained may be judged from the accompanying illustrations.

Before the cars were built two complete models in wood to a scale of $\frac{3}{4}$ in. to the foot were made up by the car builder from the original drawings. On these models, which were described in *ELECTRIC RAILWAY JOURNAL* for May 8, 1926, page 806, the lines of the car were perfected so as to give as nearly as possible a continuous streamline appearance that would eliminate the many awkward breaks and angles that are frequently present on older types of cars. These models also served to work out painting combinations which would emphasize the streamline effect that was sought. As a result of this preliminary study, numerous slight changes were made for improvement of the appearance that were not apparent on the ordinary working drawings.

SKIRT AROUND BOTTOM

Experience with the three sample cars originally submitted last spring led to the adoption of a skirt extending around the car below the body. In working out this construction, however, the skirt has been streamlined with the step and the front entrance well. Three different combinations of exterior color are used to

designate the cars for three different routes. Solid bands of color are carried horizontally throughout the length of the car, and this effect is further emphasized by moldings which act as division lines between colors. The colors on the letterboard, belt rail and side panels are extended horizontally across the doors to obtain the streamline effect sought.

On a group of thirteen of the cars the side panels are blue with a light green skirt, blue letterboard and gray roof. On all of the cars the posts between belt rail and letterboard are painted cream. A broad 4-in. band is set off at the belt rail line by half oval molding and is painted red continuously around the car. This band will be adopted for all cars on the system. It blends into a cowl at the top of the front dash which contains five lamps for illumination at night. The color combination on nine cars consists of pig-skin panels, desert sand skirt and letterboard, combined with red roof and belt rail bands. On five cars the side panels are desert sand color with a red skirt, letterboard and belt rail band. In this combination a gray roof is used.

Interior finish of the cars is in natural mahogany with white ceiling. The seats are of twin bucket type with double cushions, designed to provide the maximum in passenger comfort. These seats, which were furnished by the St. Louis Car Company, are upholstered in gray Spanish leather on fourteen cars and in gray Kemi-Suede on the remaining thirteen. The total seating capacity is 42. Of this number ten seats are located in a rear end smoking compartment, which is partitioned off from the remainder of the interior.

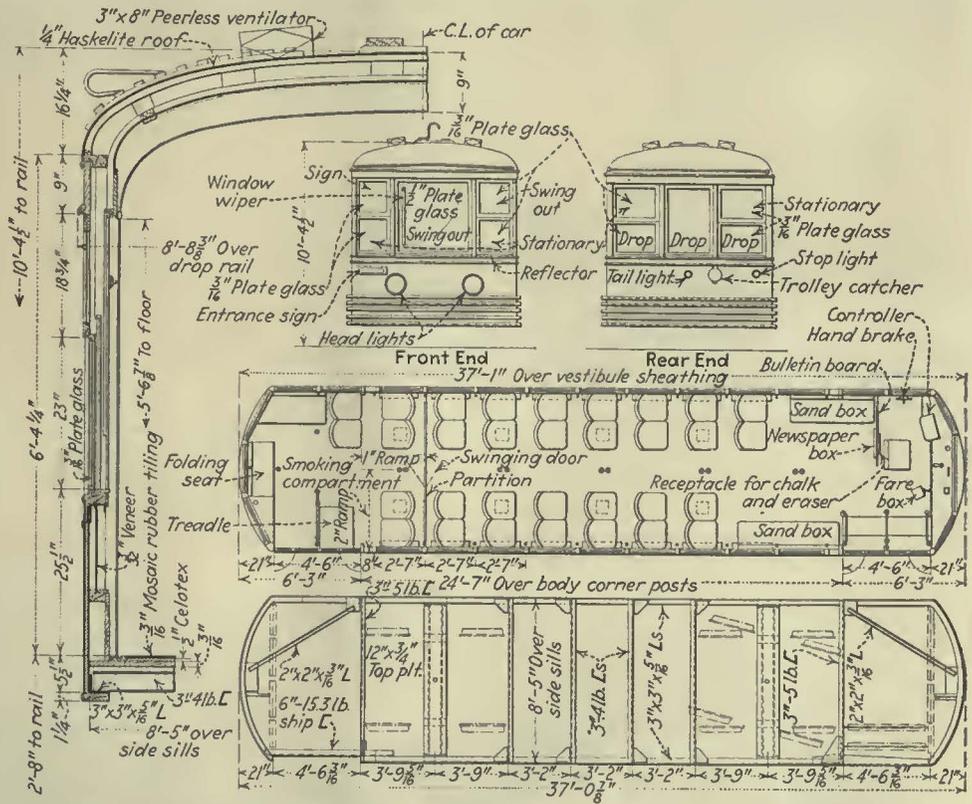
The cars are designed for single-end operation. They are arranged for one or two-man service, or may be handled by one man with street fare collectors. All apparatus at the front end is inclosed in a special control cabinet. The operator has a full upholstered seat and the platform controller is dropped down in the floor to put the top at a convenient height for the seated operator. The Peacock hand brake is at the left of the operator instead of in the customary position in the right-hand corner of the vestibule. Green and black mosaic rubber tiling covers the entire floor, including the vestibules.

INSIDE STEP AT FRONT END

Platform and body floors are continuous. A 2-in. ramp leads from the center line to the side sill at the rear end. Inside step construction at the front end gives very low step heights of 11 in., 10½ in. and 10½ in. respectively from the rail to the top of the floor. The latter is 2 ft. 8 in. above the rail. Folding steps are used at the rear end. An automatic treadle controls

the rear exit door. Full safety car devices are included. There is also a selector valve attached to the M-28 brake valve for selective operation of the front folding doors. A conductor valve on the stanchion at the rear end controls the rear entrance door when the car is operated by two men. A back-up device furnished by the St. Louis Car Company is included in the equipment so that the car may be temporarily operated from the rear end for switching purposes.

Special St. Louis Car Company equalizer type trucks in which the journal boxes are rigidly clamped into the cast-steel equalizer frame are used under the cars. The truck side frame rides in guides in the equalizer casting instead of having the customary type of pedestal construction. The design is arranged so that either



Plymetl Side Panels Are Used Outside of the Fourteen-Gage Steel Side Girder Plate on the Grand Rapids Cars. One-half Inch Thick Celotex, Both in the Sides and Floor, Is Intended to Deaden Noise and Provide Heat Insulation. Arrangement of Sash at Front and Rear Ends Is Shown in the Upper Views.

friction or roller type bearings may be used by interchanging a friction box for a roller box or vice versa. Provision is also made for application of a drum type brake if this is found desirable. Two of the 27 cars will be equipped with Hyatt bearings and two with S.K.F. bearings. An accompanying illustration shows the general truck construction.

Four GE-264 motors are used per car. Twenty-three of the cars are equipped with G.E. silent gears, in which a hollow web is filled with noise-absorbing material. The remaining four cars are equipped with Tool Steel gears with asphaltum pads bolted to the sides of the webs to deaden noise. Davis cast-steel wheels are made with six cored holes in each web. To three of these rubber pads are bolted to deaden the ringing of the wheels in service.

Care has been taken in the body construction to deaden noise as far as possible. The 1 3/8-in. pine floor is covered with a 1/2-in. layer of Celotex and then with



Pleasant Surroundings and an Air of Comfort In the Interior Are Designed to Attract Riders. View Looking Forward Toward Operator's Position



Looking Back Toward the Smoking Compartment at the Rear End. Preliminary Experiments Proved the Popularity of This Arrangement

$\frac{1}{8}$ -in. rubber floor tiling. A 14-gage steel plate is used on the outside of the side posts and is stiffened by two angle pressings riveted to the plate at each post. One-half-inch Celotex is applied to the outside of this plate and covered with Plymetl outside panels. On the inside the side girder is also covered with $\frac{1}{2}$ -in. Celotex and then with three-ply veneer inside lining. The roof is of Haskelite, covered on the outside with Kemi-Suede. Around the bottom of the car the skirt is intended both to improve the appearance by concealing part of the running gear and also to deaden running noise by confining it under the car. On each side of the trucks the skirt is hinged in sections, which can be raised to

make the truck and motor equipment more readily accessible for inspection and repair. These hinged sections are arranged so that when in service they are rigidly fastened in place by appropriate clamps to form a continuous structure around the bottom of the car.

The cars are 37 ft. $\frac{1}{8}$ in. long over all, 24 ft. 7 in. over body corner posts, with side post spacing of 31 in. and nine body side windows. They are 10 ft. 4 $\frac{1}{2}$ in. high from rail over top of roof and 8 ft. 5 in. wide over side sills. The weight completely equipped for operation is 29,500 lb.

In the body the upper sash is permanent and the lower sash is brass, glazed with $\frac{1}{8}$ -in. plate glass and



At the Rear End is an Automatic-Treadle-Operated Exit with Folding Step. For Two-Man Operation an Entrance Door Controlled from a Conductor's Valve on the Platform is Provided



Inside Step Construction is Used at the Front End. Apparatus is Included in a Special Control Cabinet and the Operator is Provided with a Comfortable Seat

Details of Specifications for New Grand Rapids Cars

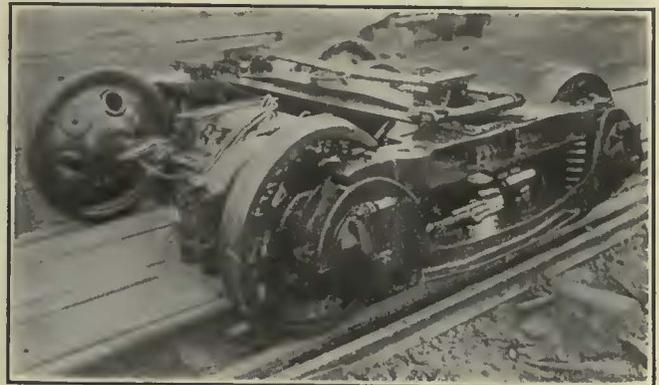
Number of cars.....	27	Destination signs.....	Keystone	Roof covering.....	Kemi-Suede
Length over all.....	37 ft. 7 in.	Door equipment with automatic exit.....	National Pneumatic Company	Sash.....	Curtain Supply Rex Brass
Length over body.....	24 ft. 7 in.	Energy-saving device.....	Economy Meter	Seats.....	Twin bucket, St. Louis Car
Width over side sills.....	8 ft. 5 in.	Exterior paint.....	Krakno, R. F. Johnson Company	Seat material.....	{ Thirteen cars, Eagle-Ot-tawa Colonial Leather Fourteen cars, L. L. Wolf Kemi-Suede
Height over roof.....	10 ft. 4 1/2 in.	Fare box.....	Woods Company	Slack adjusters.....	Westinghouse Form E
Seating capacity.....	42	Floor covering.....	Manhattan Rubber Company	Step treads.....	Kass
Side post spacing.....	31 in.	Gearing.....	{ 23 cars, G.E. hollow web 4 cars, Tool Steel long and short addendum	Stop light and flashing signs.....	Oskel Equipment Company
Weight complete.....	29,500 lb.	Gongs.....	12-in. Pneumatic Electric Service Supplies	Stanchions.....	Porcelain enamel
Body builder.....	St. Louis Car	Hand brakes.....	Peacock staffless, aluminum handle	Trolley catchers.....	Ohio Brass
Trucks.....	St. Louis equalized E1B-58	Heaters.....	Railway Utility truss plank	Trolley base.....	Ohio Brass
Motors.....	Four G.E.-264-A	Headlights.....	Ohio Brass (two per car)	Trolley wheels.....	More-Jones
Control.....	Single-end G.E.-K-35-KK	Interior finish.....	Mahogany	Thermostat.....	Railway Utility
Air brakes.....	Westinghouse	Interior hardware.....	Aluminum	Ventilators.....	Peerless
Compressor.....	G.E.-C.P. 27	Illumination.....	Brascolite center dome fixtures	Wheels.....	Davis One Wear
Safety equipment.....	Safety Car Devices Company	Passenger buzzers.....	Farraday	Scrapers.....	Root No. 8
Anti-freeze device.....	Anti-Freezer	Roof.....	Haskelite	Window wiper.....	St. Louis Car
Body side panels.....	Plymetl			News vending box.....	Read Wyl U Ride Company
Body insulation.....	Celotex			Wiring conduit.....	Duratube, Tubular Woven Fabric Company
Back-up device.....	St. Louis Car				
Curtain fixtures.....	National Lock Washer				
Curtain material.....	{ 26 cars, double-faced Pantasote 1 car, Kemi-Suede				

arranged to raise. Front and rear vestibule windows are also glazed with 3/8-in. plate glass and the sash are arranged as shown in the accompanying illustrations. The motorman's sash at the front end is a single large brass frame glazed with 1/2-in. plate glass and hinged at the top so that it may be swung outward similar to a windshield. Two headlights with automobile type lenses extend out from the front dash. Five-bar automobile type bumpers are carried at both front and rear ends.

Duratube is used for control and body wiring. The wiring installation is in general accordance with the new code for car wiring recently adopted by the Board of Fire Underwriters. Heaters are installed in the truss plank. Lighting switches are mounted inside the control cabinet at the front end with a small trapdoor in the top for ready access by the car operator.

Five Brascolite double-lamp fixtures are arranged down the center of the body for interior illumination and are each equipped with two 56-watt lamps. There are five 56-watt lamps under the dash hood for illumination of the front dash and two circuits of 23-watt lamps for auxiliary lights. An "enter at front" illuminated sign is installed in the front dash under the destination sign and an illuminated "exit at rear" sign is carried in the interior on the header at the front of the body. A stoplight is used at the rear end. All three of these devices, furnished by the Oskelite Company, are flashed on and off with the operation of the car brakes. One complete circuit of 23-watt lamps is used for their illumination. The other auxiliary circuits illuminate the destination signs and step lights at both front and rear ends. The step light at the front end is mounted on the outside of the door header with a special marker lens in the housing, which is of different colors to designate routes.

Back of the operator a substantial mahogany bulkhead frame is provided as a shield from the body lights at night. This carries a blackboard for news bulletins to passengers. Newspaper vending boxes furnished by the Grand Rapids Herald are carried below the blackboard.



The Special Type of St. Louis Truck Has a Cast-Steel Equalizer Frame in Which Are Rigidly Clamped the Journal Boxes, Inter-changeable for Friction or Roller Bearings. The Truck Slide Frame Proper Rides in Vertical Guides Cast in the Equalizer.

On the sides of the cars the names of prominent Grand Rapids pioneers and early residents are lettered. This plan is intended to identify the railway with the progress of the community. Some of the cars are named for the various high schools and in those cases the school colors are carried in appropriate pennant design.

The principal dimensions and specifications are shown in the accompanying tabulation at the top of this page.



Automobile Type Bumpers and Double Headlights Give the Front of the Grand Rapids Cars a Novel Appearance. The Cowl at the Top of the Dash Incloses Five Lamps for Illumination

P.R.T. Plans to Carry 62,000 an Hour at the Sesqui-Centennial

Public Transportation to the Exposition Grounds and Inside Will Be Cared for by the Philadelphia Rapid Transit Company—Information Booths Established Throughout the Grounds and in the City—Approximately \$2,000,000 Has Been Expended by the Company in Preparation, 90 per Cent of Which Is a Permanent Outlay

By Edwin F. Thayer

Assistant Editor ELECTRIC RAILWAY JOURNAL



Alrplane View Taken Several Weeks Ago, Looking to the Northwest

The stadium is pictured in the immediate foreground, while the auditorium, located just to the west of Broad Street, may be seen in the upper right hand corner. Patti-

son Avenue (east and west) bisects the middle of the picture and the construction work on the main loading terminal is shown under way at the extreme right. The

"Gladway" for amusement concessions is in the open space at the upper center, while to the left center may be seen the India Building and the Street of '76.

FROM a pictorial standpoint the Sesqui-Centennial Exposition, opening on May 31 in Philadelphia, holds much of interest. But from a transportation standpoint it perhaps offers even more to stimulate the fancy of a railway man. When one turns over in his mind the thought that the numbers of visitors who are expected to come to Philadelphia are variously estimated at from 65,000 to 150,000 per day, it becomes evident that the conveying of these crowds to and from the exposition grounds will prove no small task. Furthermore, the visitors must be transported in addition to Philadelphia's regular heavy traffic and over streets congested with thousands of private automobiles.

The fame of the Sesqui-Centennial has been heralded

to the Antipodes. This colorful drama is expected to draw millions of visitors from every corner of the country and from every section of the world during the six months of its history. Buildings of imposing size and elaborate decoration constitute the physical plant that has been erected at great expense. In the southeastern corner is a mighty stadium, capable of seating 100,000 spectators and of accommodating many thousand additional standees. There is also a large auditorium that will seat 20,000 people. These two structures will handle most of the important events that the exposition will boast, but in addition there will be countless other attractions to lure the visitor to the grounds.

Had the exposition been located in West Philadelphia, rather than to the south of the city, a large portion of the traffic problem might have been eliminated, for automobiles entering the environs of the city from the north or west and destined for the exposition grounds might have found ingress without having to traverse the main business district and the principal transportation arteries. With the present location practically every vehicle must pass through the center of the city and south along Broad Street or one of the adjacent thoroughfares, and it is over these identical streets that the Philadelphia Rapid Transit Company must operate its exposition cars and buses.

How to meet the great difficulties thrust in their path by this condition has been puzzling P.R.T. officials for several months. It required no major prophet to foresee many and many an exasperating traffic tie-up during the course of the exposition period, and the knowledge that these tie-ups would be due to conditions

and on various east-and-west streets in the vicinity of the grounds will be left to serve the stadium, after the exposition proper is a thing of the past. It is probable that all loading stations, other than the main one at the Pattison Avenue entrance, will eventually be abandoned and the tracks at those points relaid for through service.

Throughout the summer and fall months a host of important spectacles have been scheduled for the stadium and auditorium on the grounds. To meet the heavy peak conditions which these events will occasion, the railway has available street car and bus equipment which will be able to handle approximately 62,000 persons per hour. Of this total, 52,000 will be cared for on the several street car lines leading to the grounds, while the remaining 10,000 will be carried by bus to the various bus terminals located in the vicinity of the exposition.

To date it has not been possible definitely to deter-



Intramural Bus Equipment to Be Used Within the Exposition Grounds

beyond their control, rather than to inadequate equipment, provided little comfort.

Full co-operation has been received from the city and Sesqui officials in scheduling exposition feature events so that peak hours for exposition crowds would not fall at hours when the regular city transportation is at its height. In other words, a big event which has been in progress in the stadium during the afternoon will be continued until after the downtown peak hour has passed or will be resumed again in the early evening. Thus two birds will be killed with a single stone, for the crowds will be kept off the downtown streets and the revenue of food vendors on the grounds will be materially increased.

An outlay of approximately \$2,000,000 is being made by the local railway company in providing tracks, loading terminals, intramural bus equipment (for transportation within the exposition grounds) and miscellaneous equipment which will serve directly in accommodating the city's guests. In addition 50 street cars and 135 new buses have been ordered. These are to be used in supplementing the present rolling stock in use in Philadelphia and environs and in providing adequate service for the Sesqui-Centennial. Of the \$2,000,000 expenditure approximately 90 per cent will constitute a permanent outlay, for practically all of the track being laid on Seventh and Tenth Streets

mine just what the bus routes will be, although it is known that all buses will follow a single general route to the vicinity of the grounds and will there be directed to the various loading stations.

The tracks on Broad Street, which previously served the League Island Navy Yard, have been abandoned. They bisect the exposition grounds and it was desired to keep all forms of transportation, other than the intramural buses, out of the area set aside for the exposition. Now the Navy Yard is being served by tracks laid on Eleventh Street south from the Pattison Avenue trolley terminal and bordering the stadium grounds.

Cars are in operation over the tracks on Tenth Street at the present time, but the Seventh Street line will not be completed for several weeks, due to the great delay in getting under way with the street opening projects. The railway has been close on the heels of the city with its track-laying gangs ever since the street opening began, laying track almost before the grading had been finished. The city has been doing all of the grading work and has supplied the sub-grade and carried on the paving work. The company has been responsible for the laying of its tracks and for erecting the overhead line.

Due to the difficulty experienced in obtaining crushed rock for grading and ballasting purposes it has been



At Left, One of the Inclined Ramps Leading to the Pattison Avenue Loading Platforms. At Right, Some of the Special Trackwork at the Pattison Avenue Terminal

found necessary to use almost any material which came to hand. Furthermore, although intended to be permanent in nature, it was necessary to lay track over a sub-grade which had not been given time to settle properly and early rehabilitation expense is anticipated.

The main Pattison Avenue terminal is equipped with four concrete loading platforms and is capable of accommodating sixteen Tenth Street cars simultaneously. Passengers will reach these platforms by an underground passageway with ramps leading up to each. Between this terminal and the loading platform at Pattison Avenue and Broad Street, which will handle six Seventh Street cars simultaneously, storage tracks will make it possible to keep a reserve of 170 cars available to handle large crowds assembled for feature events in the stadium or elsewhere in the grounds. Some cars on Tenth Street will of course be operated for through service to the Navy Yard.

None of the loading platforms and terminals will be

covered, as from the standpoint of economy it did not seem advisable to make this additional outlay. Furthermore, the lack of time made it essential to concentrate every effort on matters of more fundamental importance.

From the standpoint of the company, the Pattison Avenue entrance to the grounds will be the most important one. While the so-called main entrance is located at Broad Street, between the Auditorium and the Palace of Liberal Arts and Manufactures, the events which will attract the largest crowds will probably be those held in the stadium, and the Pattison terminals will handle most of that peak traffic. Additional loading stations have been constructed at Pollock and Marvine Streets and just west of Broad Street. These stations will handle visitors destined for or coming from the Broad Street entrance to the grounds.

An exclusive concession to handle all public transportation within the exposition grounds has been



Work Being Rushed on the Trackage Which Will Handle Street Cars in the Vicinity of the Grounds

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|---|--|
| <p>1. Construction of the storage tracks at Pattison Avenue. These will accommodate a reserve of 170 cars.</p> <p>2. Laying four lines of track on Pattison Avenue to care for the Tenth and Seventh Streets traffic.</p> | <p>3. Construction work on the Pattison Avenue terminal loading platforms. The substation to provide energy for the railway lines and for general exposition purposes is shown in the background. The substation has a capacity of 4,000 kw.</p> |
|---|--|

awarded to the railway. Due consideration was given to the matter of equipment for this service and, in view of the crowded walks over which the units would be forced to operate, the frequent stopping and starting to which they would be subjected and the necessary low speed of operation, it was decided to use storage-battery equipment. Twenty-five standard Commercial Truck chassis were purchased. Special bodies for these were built by the J. G. Brill Company of Philadelphia. Originally it had been intended to use a much lower chassis, but it was found that the type of uneven roadway over which the buses were to be operated would not permit. Furthermore, the Commercial Truck chassis may be converted for regular trucking service when the exposition is over.

The bodies of the present equipment give the impression of long and rakish lines, however. Longitudinal seats facing outward and with a runway down the center of the bus and between their backs are provided. These extend from the front to the rear fenders, and seats for two additional passengers are provided over each of the rear fenders. The conductor passes up and down the center runway for purposes of fare collection. The heads of the passengers are protected from the beating sun by a gaily striped canopy. The bodies of the buses are painted with the conventional P.R.T. colors—green and cream yellow—while the operators and conductors are uniformed in a distinctive Sesqui-Centennial apparel. The buses have been nicknamed "PaRTycars."

The buses are 33 ft. in length, the distance from running board to the street is 7 in., the over-all width is 90 in. and the over-all wheelbase is 24 ft. The Philco batteries used in the buses give a fifteen-hour operating period with intermediate boosting service. As it is impossible to remove the batteries for charging, due to the special body construction, it was necessary to arrange for this system of boosting, which would permit of bringing the units into the charging headquarters at intervals during the less-busy hours of the day to boost the battery charge somewhat.

INTRAMURAL SERVICE BUILDING

A shed has therefore been constructed which will accommodate six buses for booster service and general maintenance. This plant and the office for the receiver and superintendent of this equipment constitute the only structures within the exposition grounds proper which are allocated to the intramural equipment. The building contains two generators of 100 kw. and 125 kw. respectively, panels and all equipment necessary for charging the buses. Provision is made to charge the entire fleet of 25 units simultaneously.

Dual 5-in. pneumatic tires are on the rear wheels and single 5-in. tires on the front. Each bus is equipped with two motors driving the rear wheels by means of concentric gearing. They have a maximum speed of 8 m.p.h. and an average speed of 6 m.p.h. The front wheels are adequately protected by bumpers. A North-easter non-shrill horn is used, as it is desired to warn, rather than to frighten, the dense masses of pedestrians with which the buses will be forced to contend.

The operators and conductors are new men, specially employed for the period of the exposition. They are largely students who are experienced in handling automobiles and who have been specially trained for these unusually long buses. The entire force for the

intramural buses consists of 65 operators and conductors, seven mechanical men to handle the shop equipment, a receiver, a clerk, and a supervisor.

Final determination of the routes within the grounds to be served by the intramural buses has not been made even today. Decision on this point will be influenced by traffic conditions as they develop, by the degree of popularity which is accorded to the equipment and by various other local conditions. Cash fares of 10 cents will be collected universally and no transfers will be issued. It is the hope of P.R.T. to be able to break even on this intramural venture—as a money-making undertaking it has never seemed feasible.

INFORMATION SERVICE PROVIDED BY P.R.T.

Seven information booths have been erected at strategic points in the exposition grounds by P.R.T. These booths are manned by expert information men who have been in the service for years. In addition P.R.T. is training a force of men for service at large conventions, it being planned to have a man specially detailed to be present at conventions held in the city to supply all types of transportation information to the delegates. One man will be located at the Baltimore & Ohio Railroad Station to furnish information, and there will be a man working in the city hall square in conjunction with Sesqui-Centennial Housing Accommodations, Inc. This organization has the exclusive housing concession in Philadelphia during the exposition period and has undertaken to supply every visitor who requests a room with the type of lodgings that he desires. The P.R.T. information man will be on hand to direct the stranger to his portal for the night. The Housing Corporation will have representatives in every department store, and thus P.R.T. will be in touch, indirectly, with these bureaus.

All in all, more than 25 railway men will be engaged in this type of service. This number includes a highly-skilled man who will be constantly on duty at the general switchboard in the central information office. He will answer questions phoned in, either by the public or by the field information men who have been stumped by some particularly knotty question. While this service will indirectly work to the benefit of the street car company, it is a real contribution to the success of the exposition as a whole, for the information men will be expected to answer thousands of questions that have absolutely no bearing upon matters of transportation. Copies of the special Sesqui-Centennial edition of *P.R.T. Traveler* will be on sale at all of the branch information offices of the company and will also be supplied by conductors and subway-elevated cashiers.

Various estimates place the total expected attendance at the Sesqui-Centennial at between 25,000,000 and 35,000,000. Great haste has of necessity prevailed in laying some 6 miles of track, erecting terminals, employees' waiting rooms, information booths, and a substation, and in perfecting the general operating plan for the exposition period to handle the expected throngs. Yet for all that haste the transportation facilities that have been provided in so short a time show remarkable accomplishment. The job is not finished yet—nor will it be completed until the months of winter have chilled the gaiety which was the Sesqui-Centennial and relegated it to the shelf of memories. But in the meantime there is "something doing" in Philadelphia.

Better Car Routing and Traffic Control Proposed for Baltimore

SECOND ARTICLE

Revision of Car Routing and Traffic Control Methods Are Proposed by the Engineers to Reduce Congestion in the Business District—A Major Traffic Street Plan Is Presented that Is Intended to Relieve the Present Inadequate System of Thoroughfares

SOME 80 per cent of the lines of the United Railways & Electric Company of Baltimore are operated through or looped in the central business district. As there are many narrow and but few continuous east-and-west streets, many turning movements and an uneven distribution of service naturally result. In this area, as in other portions of the city, competitive construction and ownership of tracks has in many cases resulted in circuitous routes designed to reach certain parts of the downtown area. It appears that these routes have been modified or changed from time to time, but, as in other cities, the tendency of public opinion has been to prevent the making of changes as long as possible.

From a study of the data collected by the engineers, Kelker, De Leuw & Company, and referred to in the article published in *ELECTRIC RAILWAY JOURNAL* for May 22, page 883, several alternative plans for routing were prepared, based on the following principles:

PRINCIPLES OF ROUTING CONSIDERED

1. The discontinuance of street car operation on certain streets to provide for greater freedom in movement for other street traffic.
2. An even distribution of car service so as to provide the maximum opportunity for future increases.
3. A reduction in the number of turning movements throughout the downtown area, especially in the congested zone.

There are three factors in the routing of street cars, apart from topography and street layout, which contribute largely to street congestion. They are, in the order of their importance: (a) Left-turn movements, (b) right-turn movements and (c) the attempt to operate more cars over any street in a given period of time than the existing traffic conditions will permit. Working under the limitations imposed by the conditions, the recommended rerouting plan reduces the left-hand curves used by street cars in the district bounded by Center, Gay, Camden and Greene Streets from 49 to 33 (33 per cent) and the right-hand curves from 59 to 40 (32 per cent). In the most congested section of the downtown district, that bounded by Saratoga, Howard, Baltimore and Calvert Streets, the left-hand curves are reduced from eight to two and the right-hand curves from seven to two, decreases of 75 and 71 per cent respectively.

The reduction in number of curves used, together with other changes made in the routing, will decrease the number of street car turning movements made daily in the larger areas as follows: Left-hand turn-

ing movements from 13,294 to 8,197, a decrease of 5,097 (38 per cent), and right-hand turning movements from 15,085 to 10,315, a decrease of 4,770 (32 per cent). In the most congested area the left-hand turns will be reduced from 2,261 to 789, a decrease of 65 per cent, and the right-hand turns from 2,617 to 789, a decrease of 70 per cent. The car flow charts reproduced herewith show the results with the present and proposed routings during the maximum half hour of the afternoon rush.

In the report the detail changes in the various routes, with the reasons therefor, are given, along with a list of the special work and tangent track required to make the plan effective.

LIMITED STOP PLAN

The general development of Baltimore, with subdivisions having blocks of from 300 ft. to 500 ft. in length, is the greatest cause of the low speed made by street cars. Street car stops are made at almost every intersection, and the frequency of the car stops when compared with the number of stops made in other cities is one of the outstanding features of street railway operation in Baltimore. The present number of stopping places per mile of single track within each mile zone measured from Charles and Baltimore Streets ranges from 13.12 in the first zone to 8.08 in the territory beyond the 5-mile zone, averaging 10.22 per mile of single track for the entire system, as compared with slightly more than eight in Washington and in Chicago. The diagram of the residential distribution of those persons using the street cars (see page 885, issue of May 22) shows that service to accommodate the majority of them and of the persons using automobiles must be given by operating cars over the principal streets radiating from the central business district. It follows that any measure which can be adopted to secure faster speed with safety will benefit the two largest groups of people using the streets.

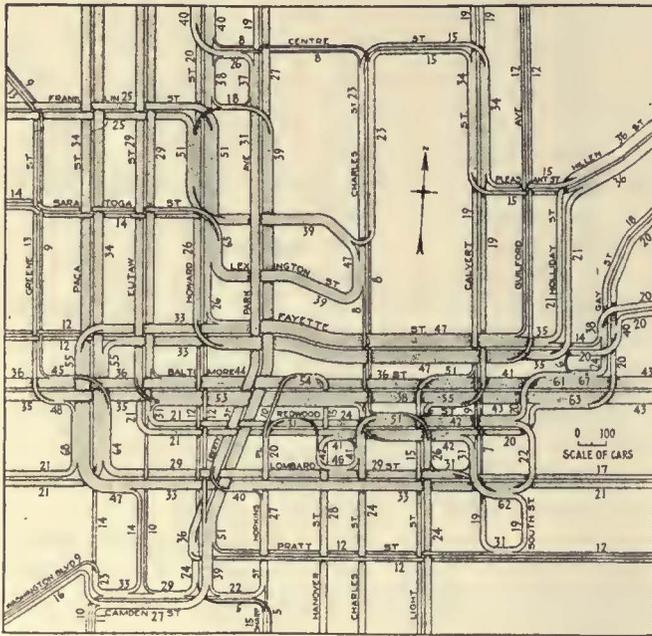
Widening of streets, though expensive, will be necessary in many cases if the time spent in traveling between home and office, store or factory is not to be greatly increased in the future. In the meanwhile the traveling time can be reduced for the majority of workers if some of the steps were eliminated during the morning and evening rush hours. It is recommended in the report that a limited stop service be inaugurated between 6 and 9 a.m. and between 4 and 7 p.m., and that in these periods the stopping places be adjusted so that the average number of possible stops for the entire system be as nearly eight per mile of single

track as practicable, and that during all other hours of the day and night the stopping places remain as at present.

TRAFFIC CONTROL

Traffic control is required on the streets and highways for the safety and convenience of the users and also to provide for the efficient use of the street space. With the advent of the automobile street traffic has increased tremendously, and this, together with the necessity of promoting safety, has led to a wide extension of the scope of traffic control.

The American tendency to concentrate many activities in a small area in the center of a large city is one of the outstanding causes of traffic congestion. There is crowding, both on the roadways and on the sidewalks. In a few of the larger cities there are sec-



Car Flow in Baltimore Business District with Present Routing. The Confusion Incident to the Many Right-Hand and Left-Hand Turns Slows Down the Cars and All Vehicle Traffic

tions where saturation has nearly been reached; that is, the crowding and congestion have become so great that the streets are being used almost to capacity, and in many other cities the use of available street space is approaching 100 per cent.

The principal impediments to the free flow of traffic along any roadway are those presented by parking, cross traffic, left-hand and right-hand turns. While it is impossible to eliminate the interference of cross traffic except by grade separation, it is possible to accelerate the movement of traffic by adopting a method of control which will give to the opposing traffic streams the requisite amount of time and no more. The movement of pedestrians at intersections, if uncontrolled, greatly slows down all traffic movement and at the same time causes a very dangerous street hazard. So-called jay-walking, or the unregulated crossing of roadways between street intersections, is not only dangerous but at times interferes seriously with the free flow of vehicular traffic on roadways.

One of the greatest annoyances to a driver of a motor vehicle is the left-hand turn. The right-hand turn, in itself, is seldom an impediment to roadway traffic.

However, it is a source of danger and annoyance to pedestrians. There is frequently a clamor for the elimination of both right and left turns. People who have given the subject little thought would have them eliminated entirely, and proposals for the regulation of them vary all the way from this extreme to the prohibition of turning movements at a single intersection. The elimination or prohibition of left-hand turns at a single intersection simply removes this cause of congestion to an adjacent intersection and results usually in causing equal or greater congestion at a different place. Consequently the best results are obtained in nearly all instances in dense traffic areas by the prohibition of left-hand turns on a group of streets or through an area.

A lengthy section on various forms of traffic control signals is given in the report. Automatic signal systems are held to have certain advantages. They keep traffic under control and speed more uniform. They also have the tendency to cause drivers of vehicles to follow in their own lane of traffic more closely and there is less weaving from one lane to another on wide roadways. However, synchronized signals have their disadvantages, which ordinarily are not as apparent as their advantages. The time allowance for movement in each direction is necessarily a constant throughout the zone, being governed by the heaviest streets. When automatically controlled, it frequently happens that traffic is not moved as efficiently at some intersections as it would be were these intersections under individual control. This is particularly true of the movement of street cars. Another disadvantage in this type of control is the power peak caused by the possibility of almost half the street cars in the district starting at the same time.

The erroneous idea that synchronized automatic signal systems speed up the traffic is rather widespread. This is probably because higher crest speeds may be attained with safety after the installation of synchronous signals; but the increased standing time at intersections more than offsets the slight gain resulting from any increase in crest speeds.

One of the chief interferences offered to the free flow of vehicular traffic is the unrestricted movement of pedestrians. The pedestrian has certain rights, to be sure, but certainly the time has come when his habits and rights must be modified somewhat in his own interest and in the interests of all other classes of traffic. Where there is vehicular traffic control the pedestrians should be required to obey the signals.

Safety zones for the protection and convenience of car patrons have been established and are maintained at 104 points in Baltimore, 89 in the outlying districts and 15 in the central business district. Twelve of those in the outlying districts are of the raised platform type. The minimum width of a safety zone measured from the nearest rail should be 5 ft. and the minimum space required for vehicles to pass between a safety zone and the curb 8 ft. Where the roadway space between rail and curb is less than 13 ft. the sidewalk can be recessed and the curb set back a sufficient amount to provide the necessary space for a safety zone.

Parking regulations should be progressive in their steps, advancing in restriction as traffic increases. The complete prohibition in the downtown district of Baltimore is not necessary today, but must be considered as an eventuality. At the present time it is essential to

the city's best interest that the existing parking regulations be extended somewhat during the rush hours, but even an extended regulation will have to be modified from time to time to meet increases in traffic.

The recommendations for traffic control and parking are given in the summary at the beginning of the previous article (page 884).

THROUGH STREETS

The success of boulevard systems for pleasure cars, taxicabs and motor buses has led to a demand for a similar system of through arteries for the use of other classes of traffic. It is fully as important that commercial vehicles and street cars be afforded efficient and convenient thoroughfares as it is that pleasure cars be provided with them. A "through street" may be defined as any thoroughfare which carries all classes of traffic and which is protected by requiring all cross traffic to stop before entering them. Through streets have been found to serve a very useful purpose when carefully located.

In the establishment of a system of boulevards and through streets it must be borne in mind that too many restricted streets or a system which imposes so many boulevard and through street stops that they become burdensome will defeat its own objective. Where there are so many stops that motorists fail to observe the stop regulations, a situation is caused of much greater danger than were there no through streets.

A MAJOR TRAFFIC STREET PLAN

With one or two notable exceptions, the street system of American cities is the result of haphazard real estate development. Subdivisions have been made from time to time with one principal object in view—that of creating a unit which in itself would have an interior arrangement favorable to the selling of lots. The early highways carried very light traffic up to the advent of the automobile and were adequate to serve the needs.

Now all of this is changed. The volume of traffic which has resulted from the ever-increasing use of the automobile is bringing out clearly all of the defects of the early street plans, and today street plans are required that provide an adequate number of wide and well-paved highways to accommodate present and future traffic.

The streets of a city can be grouped roughly into two general classes—major and minor. In the first group are found those streets which, because of their location, furnish more or less direct routes from the central business district to centers in the outlying urban and suburban areas; those which by reason of continuity and the serviceable condition of their roadways are used as heavy traffic arteries; boulevards which form direct communication between parks and amusement and business centers, and business streets in the commercial and industrial districts. All other streets which connect the major streets, either directly or indirectly, may be classed as minor streets.

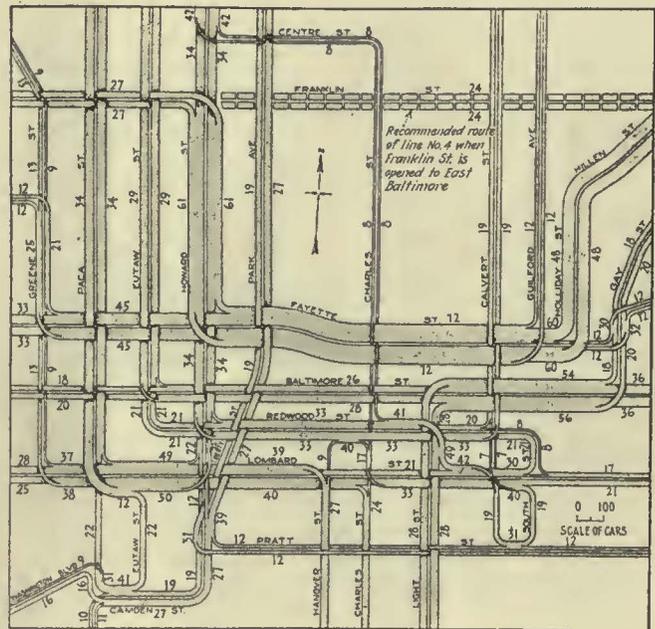
A system of major thoroughfares is composed of the following elements: (1) Distributor streets, (2) arterial thoroughfares, (3) inter-district thoroughfares, (4) boulevards and (5) business streets.

To reduce turning movements and unnecessary travel in the downtown area to a minimum a system of distributor streets just outside of and encircling a central congested area is required. Such a band of streets

would connect with and articulate all of the important streets in the central area as well as the important thoroughfares radiating from it. Arterial thoroughfares are the principal traffic streets radiating from the central district to and through the urban residential areas to the suburban centers. Upon such streets is imposed the burden of carrying a large proportion of the traffic of the city. It is also important that a major traffic street plan provide traffic arteries connecting the various residential districts one with another.

A boulevard system should include streets touching or extending through the central business district and connecting it with the principal parks, playgrounds and residential streets, as well as to furnish easy access to the driveways in public parks.

Business streets are almost always street railway or bus line streets and, with the operation of these col-



With the Proposed Routing the Looping of Cars in the Central Area Has Been Much Reduced. Left-Hand Curves Are Reduced 33 per Cent and Right-Hand Curves 32 per Cent

lective transportation units and of other vehicular traffic, the highest traffic densities are found on them. Unfortunately these streets, which have the greatest need for ample width, are generally those upon which widening projects are almost impossible on account of the high values of land and buildings.

DETERMINING ROADWAY CAPACITY

Roadway capacity is determined by the number of traffic lanes, the amount of cross traffic, the system of traffic control, the uniformity of spacing and speed of vehicles, the skill and habits of the drivers, the type of vehicle, weather conditions and many other factors. While it is possible to calculate, assuming ideal conditions, almost any capacity for a traffic lane, such conditions are never realized. Reliance must be placed almost entirely on actual tests and observations.

It is generally assumed that a lane for moving traffic requires a width of from 9 to 10 ft. Theoretically, the capacity of a 20-ft. (two-lane) roadway for traffic moving in the same direction is twice that of a 10-ft. roadway, the capacity of a 30-ft. (three-lane) roadway three times that of a 10-ft. roadway, and so on. Practically

the theoretical capacity of a wide roadway is seldom obtained. This is because vehicles going in the same direction weave back and forth from one lane to another, and also because the proximity of vehicles in adjoining lanes causes the driver to lengthen the interval between his and the preceding vehicle. Observations made on the Michigan Avenue Bridge, Chicago, during the maximum hour of the evening rush, show the following use of the three lanes: First lane, 100 per cent; second, 80 per cent, and third, varying between 50 and

60 per cent; making the combined use of all lanes less than 80 per cent of the maximum use of the first or inside lane. Other tests show somewhat similar figures. Counts in Baltimore showed no such degree of saturation.

From a comparison of the various counts and derived figures, it is concluded by the engineers that a single lane of a well-controlled boulevard has a capacity of about 1,500 vehicles per hour, and that 800 vehicles per hour represents the capacity of each lane of a roadway



Major Traffic Street Plan Proposed for Baltimore. The Proposed Plan Utilizes Existing Streets as Far as Possible so that a system of Arterial and Distributor Streets Can Be Provided with a Minimum Number of New Street Openings

carrying all classes of traffic with normal conditions as to interferences. On street car streets with no safety zones it is probable that the maximum capacity of a single traffic lane will be not more than 600 vehicles per hour.

Parallel parking at the curb requires a lane of about 7 ft. in width. Street cars usually occupy a lane of about 10 ft., and for safety and convenient movement of other vehicles a 9-ft. lane is required and a 10-ft. lane is much to be preferred. In planning roadways for future developments the following allowances should be made: 34 ft. for roadways of four lanes, 54 ft. for roadways of six lanes, 74 ft. for eight lanes and 94 ft. for ten lanes.

A space must be provided on each side of the roadway for parkway and sidewalk, or for sidewalk alone. This should be a minimum of 13 ft. and preferably more. Consequently, in planning streets for future requirements, the following minimum allowances should be made:

- 60 ft. for streets of four lanes
- 80 ft. for streets of six lanes
- 100 ft. for streets of eight lanes
- 120 ft. for streets of ten lanes.

In planning for the widening of streets in built-up districts it is usually found more economical to establish new building lines well in advance of the necessity. By anticipating the necessity for wider thoroughfares and the establishment in advance of new building lines along the property lines of the streets to be widened much of the usual expense of street widening projects may be avoided. If such new lines are established ten or fifteen years in advance it would be made certain that no new buildings would need to be removed and the cost of removing the old ones may not be excessive. This method is proposed for Baltimore.

DEVELOPMENT OF BALTIMORE STREET SYSTEM

Baltimore has had a steady and continuous growth during the last 60 years and the greater portion of the street system was developed long before the advent of the motor vehicle. The original plan, adopted in 1801, with but few changes, was apparently adequate for the traffic requirements for many years. Not until after the fire in 1904 were any major street improvements consummated. The fire destroyed all of the buildings in a considerable portion of the downtown district. The Burnt District Commission carried out a comprehensive program of street widening, most important of which was the widening of Light Street and Pratt Street. Huge sums have been saved through the execution of these projects at that time.

While there are many wide streets in Baltimore, they do not have the essential continuity which makes possible the most efficient use of the roadways. The early radial roads and highways, which seldom have adequate widths in the older portions of the city, are well located and furnish more or less direct communication between the different urban and suburban centers and the central business district.

Analysis of available statistics of traffic flow in the central business district of Baltimore and on the highways throughout Maryland indicate that there is a definite relationship between motor vehicle registration and the volume of traffic. The total number of motor vehicles entering and leaving the central business district has been taken by cordon counts in October of each year from 1922 on. The following table gives

the number of vehicles counted, those registered and the ratio of these numbers:

TRAFFIC FLOW AND VEHICLE REGISTRATION IN BALTIMORE

Year	18-Hour Cordon Count of Motor Vehicles	Estimated Motor Vehicles Registered	Ratio
1922.....	117,000	44,500	2.57
1923.....	138,000	55,000	2.51
1924.....	146,000	66,200	2.22
1925.....	176,000	81,400	2.19

The ratio of traffic flow in the central business district to the total number of registered vehicles is decreasing, but at a diminishing rate. It is estimated that this ratio will decrease until it reaches 2.00 in 1928 and then remain about constant. Based on this estimate the vehicles entering and leaving the central business district, if the street space permits, will increase from 176,000 in 1925 to 308,000 in 1930, an increase of 75 per cent, and to 386,000 in 1940, an increase of 119 per cent. From other statistics it is estimated that the traffic on highways where there is sufficient room for free movement will increase in almost the same proportion as does the total number of motor vehicles owned and operated. In the outer portions of the city it is predicted that by 1930 the volume of this traffic will be about 90 per cent greater than that of today, and by 1940 it will be about 135 per cent greater. From the foregoing statements it must be clear that the present street system of Baltimore must be made adequate to care for the traffic increases of the near future.

The remainder of the report deals with the detailed recommendations for creation of major streets. These follow along the lines of the City Plan Committee. The proposed changes are shown in the large map reproduced herewith. In general the recommendations provide for a series of inner distributor streets, a system of outer distributor streets parallel to and a mile or more from the inner distributor street system, with arterial thoroughfares and connecting streets to link the various centers with the central business district.

Trainmen Make Safety Suggestions

Platform Men of Cleveland Railway Appointed Regularly as Safety Inspectors—Department of Accident Prevention Formed—Co-operation with Safety Council Results in Well-Attended Mass Meeting

ONCE each month either one, two or three crews from each station, depending on the size, are appointed by the Cleveland Railway to spend one day inspecting the physical properties, including the cars, track and street conditions. A written report is made of unsafe conditions that are found. While these reports are directed to the department of accident prevention, they are reviewed in a conference held each month by the general manager, division superintendents, traveling dispatchers, superintendent of car washers, general superintendent and two of his assistants.

Suggestions that bear further analysis are assigned definitely to some one for investigation. Many suggestions are obvious and are ordered into effect at once. If corrective measures cannot be put into effect the reasons are explained to the crew making the report. Each of the men serving on these committees wears a green and white enamel button reading "Accident Prevention Committee."

A recent report picked at random (dated Feb. 3) is

from one of the crews at the St. Clair station. It contains 23 suggestions which the committee believes will reduce accidents. To illustrate the nature and completeness of these suggestions, extending over four closely written typewritten pages, several are herewith reproduced as being typical of the reports of the trainmen's committee:

An inside grab handle is badly needed on the "1000" type cars, just outside of motorman's vestibule, in order that heavy, infirm and elderly people can board safely at the front door. The center-entrance cars have an inside grab handle and we believe they would be of great use on the "1000" type cars.

The water trough at Wheelock Road and St. Clair is always running over and then causes the street to be flooded with water. When it freezes, this place is very icy and dangerous. It seems as though the water is running too fast for the drain, which causes an overflow. The policeman on the beat ought to watch this trough more often and not let the drain get clogged up.

On the "1200" type cars there are two switch holes in motorman's vestibule that are being used by motormen who chew tobacco to spit the juice through. We have noticed that the front vestibule of these cars is cleaner and sweeter than the "1000" type. Many motormen are in the habit of expectorating behind the jack and behind the controller, rather than exerting themselves a little by opening the front door for this function. We believe, therefore, it would be a good thing in the way of sanitation if the company would put a hole in the floor of these cars near the gong at the right-hand corner, for the use of the tobacco-chewing motormen.

We believe the far-side stop, westbound, at E. 45th Street should be moved over to the near side of the street. This is a dangerous corner when the eastbound cars are unloading passengers and westbound cars are coming to the stop; the people run right in front of the westbound cars.

Since an automatic traffic signal has been installed at St. Clair and E. 105th, we believe that the eastbound cars should be brought up to the beginning of the bank building. At present, motorman stops car way back from this point and he might get the green light to go and before he gets up to the street the red light will be flashed against him and thus will have to stop and wait. We suggest also that the safety zone be extended up even with the bank building.

The accident report form now in use was in our opinion all right years ago when traffic was different. However, we believe it should be changed now to cover present times and conditions, such as a questionnaire form to include whether the driver of vehicle was intoxicated; make of vehicle; type of vehicle; number of passengers in vehicle; number of women and children; did driver make boulevard stop; rail condition; equipment condition, regarding brakes, sanders, etc. Also, another report for deadheading car caused by mechanical defects, to include such questions as, "Did conductor collect all fares; whether he gave out free transfers," etc. We believe the claim department should know about the defects, as some conductors when changing cars do not collect their fares and an argument ensues on other car.

Conductors claim that the reason so many slugs are being deposited for fare is because the table on fare boxes is generally dirty. A small light should be arranged to shine in fare box so they can see what is dropped in. The fare boxes on "1000" type cars are too low from the view of the conductor and he cannot see into fare box unless sitting on stool.

It seems that whenever a cable breaks from catching under the retriever, it is always one of the small size cables, and it catches in between the brace on retriever and retriever. These small cables should be taken off and larger or thicker cables put on or else there should be plenty of tape put on small ones so they will be larger.

A water drain is badly needed at E. 79th and Hough, southbound. The water comes from the hill and settles in the electric switch, and when motorman throws the switch the people are splashed with muddy water.

We suggest the discontinuance of eastbound East Boulevard stop and placing the Yale eastbound stop at Herrick Road. A traffic officer is stationed at this point and makes cars stop for Yale and Herrick Road traffic. The East

Boulevard stop is useless where it is located as all the people live on the left side of East Boulevard.

We talked with Captain McMasters and Sergeant Nebe at the Fifteenth Precinct police station in regard to Moses' garage at St. Clair and Nottingham Road, and they said our complaint will be taken up with Mr. Moses. They told us they had many complaints about his parking violations, but this is the first one that came from the railway company.

The switch cover at E. 140th, north of St. Clair, is missing. This switch is where the Euclid cars used to wye.

Break in pavement at Larchmont switch.

Sand boxes empty at Brussels Road.

Car 923 has no hanger hook for run number.

Car 908—Retriever pulls trolley off on straight wire.

Car 917—Will not take the switch at E. 79th and Woodland.

Car 2073—No drawhead pin, front.

Car 2283—No rear screen.

Car 1025—Curtain off, front vestibule.

Car 1254—Curtain should be rewound in front vestibule.

Car 1035—Broken release spring on rear right truck.

We suggest that a lamp be installed in toilet at Euclid Beach Park.

From an examination of the several suggestions above, it will be observed that the trainmen have had some excellent ideas. Many other suggestions were made that referred to detailed operating conditions such as the elimination of certain stops, the change of safety zones and slight changes in the operation of the cars. Inspections of this kind have brought to light many minor defects and possible improvements that might otherwise pass unnoticed by the supervisory force who do not actually operate the cars.

From one of the suggestions, it is seen that the committee carried a matter to the Police Department. This has been done frequently by these platform committees, with excellent results.

Trainmen serving on these committees receive pay as if operating their regular runs. To them it is a pleasant relief from the routine of daily operation and gives them a feeling of taking an active interest in the company's welfare. This plan also brings to the notice of the company those men who are developing ability for a higher position.

Entirely apart from this inspection work are results that have been obtained by the increased co-operation recently with the Cleveland Safety Council on the part of the officials of the company. This Safety Council has been in existence for seven years. This year it has held a number of mass meetings. On Feb. 25 a general meeting of superintendents and foremen was held in the auditorium of the Chamber of Commerce Building, at which 1,200 people attended and 500 were turned away because of inability to crowd into the hall. Besides a talk on "The Philosophy of Safety" by Dr. Charles H. Rust of Worcester, Mass., an entertainment program was provided and attendance prizes were distributed. On the following evening, Feb. 26, a meeting of commercial drivers was held, with equally gratifying results.

While it takes some time to determine actually the results of such accident prevention activities, definite improvement has been noticed. A "no parking" ordinance has recently been passed and made effective during the rush hours. The ordinance requiring boulevard stops has been in existence for some time, but recently has been rigidly enforced.

The company has insisted that cars be under control while crossing special work and entering the subway under the high level bridge. The first tangible result to be noticed has been a reduction of 18 per cent of car collisions.

Texas Properties Are Getting Results from Good Merchandising Work

SECOND ARTICLE

Subsidized Bus Service Is Houston's Answer to the Problem of Providing Transportation Facilities to Newly Developed Communities — San Antonio Relies on Its Widely Extended Telephone Dispatching Service to Perform a Large Part of Its Supervisory Work — Coffin Prize Contest Attracting Attention

By John A. Dewhurst

Associate Editor ELECTRIC RAILWAY JOURNAL

ALERT police regulations are common to all Texas cities. One does not cross a street against the traffic signals with impunity. A near-by officer always challenges the offender and explains the purpose of the regulation of pedestrians. The courtesy by which this is done is of particular interest to the northern visitor.

This trait of courtesy has been carried perhaps farther in El Paso under the direction of Stanley Good, captain of traffic police of that city. He believes that speed with safety is not much slower than recklessness and proved it to its citizens by dashing across that city during a busy hour violating every traffic rule and regulation, passing cars on the left and generally doing all things a good motorist would not do. The trip took eleven minutes. He then made the same trip under similar conditions in a safe and sane manner, obeying all regulations, and it required thirteen minutes—two minutes more for safety.

Of outstanding merit has been the co-operation between the police department of El Paso and the El Paso Electric Railway. Much has been accomplished by the close co-operation between these two organizations in the regulation of traffic and the movement of the large number of passengers who daily ride the electric cars.

HOUSTON GROWING RAPIDLY

Houston has benefited tremendously by the completion of the ship channel that allows ocean-going craft to reach the city. Home-building projects in outlying territories are extensive and have placed a trying burden on the Houston Electric Company, operating the city transportation system in this fast-growing city.

Bus service has been supplied on eight different lines, five of which are complete routes from the center of the city to outlying districts, while the remaining three provide feeder service.

SUBSIDIZED BUS SERVICE IN HOUSTON

Subsidized bus service is operated on four lines at present. The three of these lines running into the center of the city are express buses, running without stop from the outlying districts to the city center. The other subsidized line is a feeder or extension service to a car line. The subsidized lines are clearly marked and the passengers know that the service depends on the subsidy from the real estate operators.

The basis for a subsidy is a contract between the railway and the real estate company, whereby the Hous-

ton Electric furnishes the necessary equipment and operates it. The real estate developers agree to pay all operating expenses, after first crediting all revenues collected. The operating expenses, including depreciation, are equivalent to approximately 28 cents a bus-mile. On the main lines the revenue has gradu-

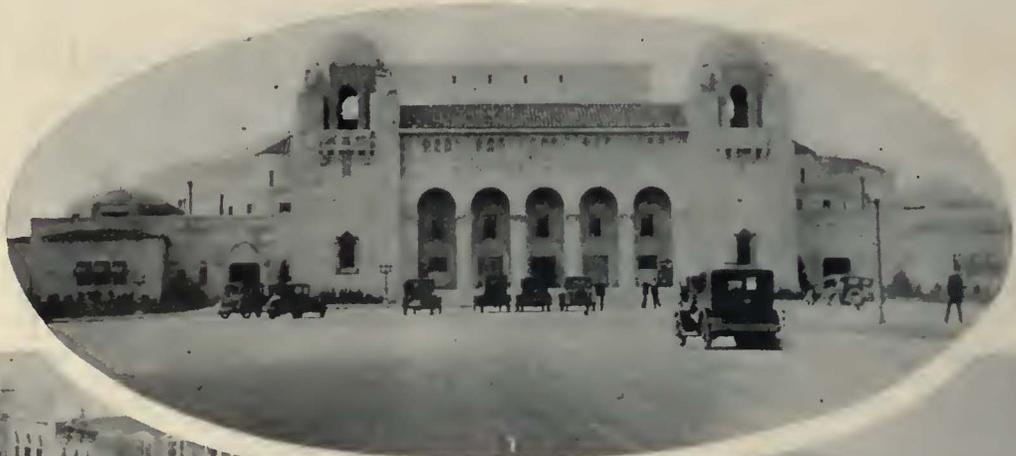


"Courtesy Pays." This Device, Distributed by the Northern Texas Traction Company, Consists of Two Cardboard Disks. By Moving the Under Disk to Any Position Marked, a Picture is Shown of the Accident that May Happen

ally increased and is now running at about 16 to 18 cents per mile. The Houston Electric Company reserves the right to take over any operation at any time and agrees to do so whenever the revenue equals or exceeds the expense for a period of six successive months. The permit to operate received from the city is granted from year to year. It is dated coincidentally with the annual contracts or renewals. The fare charged on all express buses is 10 cents cash with free transfers to cars or other buses. On non-subsidized lines or on regular buses, the same fare is charged as on cars, namely, 7 cents cash or four tickets for 25 cents.

To improve the service in general and to give better transportation the company is giving some thought to operating express service on other car and bus lines.

Many city cars are being repainted and electric flashing signs are being supplied, reading "We thank you," "Enter at the front," "Leave by the rear," etc. Treadle-operated rear doors are being installed on a number of cars as they go through the shops for overhauling.



Furnishing Transportation in Texas Cities

1. New municipal auditorium in San Antonio opened on April 19. This is one of the outstanding developments showing the progress of this city during the year.
2. Street scene looking north on Congress Street in Austin. This 100-ft. street allows ample room for street car movements and enables this company to maintain a high schedule speed.
3. Houston's bus garaging facilities in the rear of the carhouse. Each berth will accommodate two buses.
4. Looking south on Main Street, Houston. Street car service was abandoned on this street to give way to vehicular traffic and the cars are now operated on adjoining streets, where vehicular traffic is not as heavy.
5. On the route of the River Oaks bus line in Houston is found this sign, which is self-explanatory. The bus is a recognized means of transportation to this community.
6. After two hours rain in San Antonio, the streets often become flooded, as shown in this picture. The re-establishment of car and bus service was greatly aided by the extensive telephone dispatching service used on this property. The auto to the left is stalled, the one to the right will be!
7. One of the River Oaks subsidized express buses ready to leave a downtown terminal in Houston.
8. Carhouse and storage yards of Houston Electric Company.



Such cars are painted in different color combinations, it being desired to provide a change and to attract more attention. A further description of "Houston's talking cars" will be given in an article in ELECTRIC RAILWAY JOURNAL by F. J. Bennett, master mechanic for the Houston Electric Company.

MAINTAINS SERVICE BY TELEPHONE DISPATCHING

San Antonio has used a telephone dispatching service to maintain the cars on time. W. H. Holden believes that this system not only makes the service more flexible but is an economy that pays the cost of the telephone equipment and then some. Fewer inspectors are required and more efficient service is maintained. All operators call the dispatcher at the end of each line just before their scheduled leaving time. Other telephones are installed at intermediate points, there being 46 stations in all.

In addition to this system twelve inspectors are used to operate the eighteen car lines and the seven bus routes, requiring in daily operation 130 cars and 24 buses.

An example of the use of telephone dispatching was afforded on April 20. A severe rainstorm took place, 3½ in. of rain falling in two hours. Practically all car and bus lines were blocked by temporary floods for from 30 minutes to two hours. Several cars and buses went dead due to water-soaked equipment.

Despite this severe condition service was established on all but two lines in about two to three hours. On these two lines more serious trouble developed that required track or bridge repairs. Connecting service, however, was established until these lines could be repaired. Due to the telephone dispatching, lines could

Northern Texas Traction Company
WELCOME LEGIONNAIRES

This ticket, if presented at any time on
SEPTEMBER 1, 2, 3 OR 4, 1925
 will be accepted in payment of one fare on the CITY CARS only of
 this company.

NOT GOOD IF DETACHED

The "Information" Trainmen of the Northern Texas Traction Company will be glad to direct you to any part of the city.

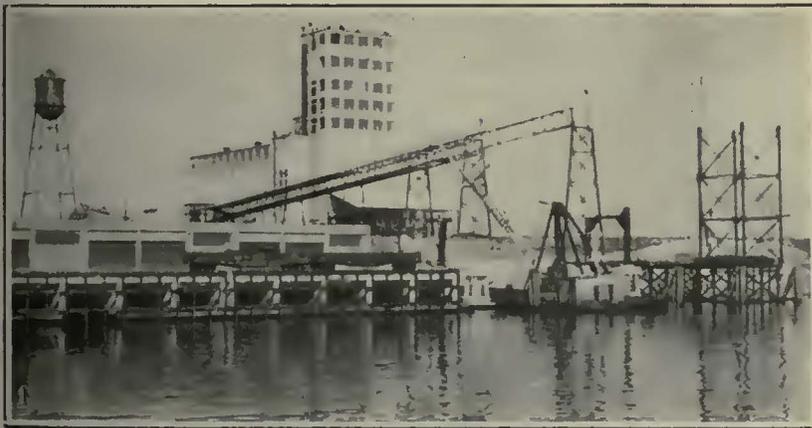
These tickets are issued complimentary by the General Convention Committee of Bothwell Kane Post No. 21, Fort Worth, for the Seventh Annual Convention of the American Legion, Department of Texas.

Reproduction of One Ticket from a Book Distributed to the American Legion in Conjunction with the Northern Texas Traction Company of Fort Worth. The Book Contained Ten Such Tickets, and When Used Was Paid for by the American Legion. Nearly \$1,500 Worth Were Sold During the Four Days of the Convention. This Plan Was Explained in an Article that Appeared in the May 22 Issue of This Paper

be placed first on long headways and then more frequent, as equipment became available.

In addition to this reliability feature, considered essential by Mr. Holden, the service is studied and schedules are changed as traffic checks indicate necessity. Cars are being repainted frequently and in many cases a blue lone star, the emblem of the state of Texas, is painted on the outside.

The work of the traffic study and control through



1. At the entrance to the turning basin of Houston's ship channel are large docks and elevators, as shown in this picture.

3. Looking across the turning basin at the Houston end of the ship channel. Ocean-going craft can load and unload at extensive docks. It is this ship channel that has caused much of Houston's recent growth.

engineering records has continued under the direction of W. R. Castle, transportation engineer. The work and methods used were told in the *ELECTRIC RAILWAY JOURNAL* of July 25, 1925, page 121. Service is budgeted in advance and schedules are built to provide this service. Careful checks are made continuously and changes are made in schedules wherever conditions warrant.

Schedules have been speeded up. Based on careful studies, the schedules between time points have been shortened to avoid slow running. Cars are given definite time points inbound from the end of the line to the city center, but are than allowed to proceed as fast as possible on the outbound trip to the end of the line, as few people are picked up on the outside of the city center on the outward trip.

Congress Street, Austin, being 100 ft. wide, has ample room for parking on the side and generally allows a clear track for the cars, so that a relatively high schedule speed is maintained.

The Austin Street Railway contemplates establishment of bus service to new developments, but to date all service is given by cars, most of which are the light-weight single-truck one-man type.

Many companies are planning to enter the contest for the 1926 Coffin Prize. Some companies have this work well under way. Based on the experience of three years past some excellent presentations are expected.

Railway Doing Well in Augusta

One-Man Cars Used Exclusively on City Lines—Improved Rolling Stock Has Brought Lower Costs—No Increase in Competition from Private Automobiles Expected

LIKE many other cities in the South, Augusta, Ga., is attracting each year more residents, both permanent and temporary. Owing to its altitude, dry climate and equable temperature, Augusta and its neigh-

boring city in South Carolina, Aiken, have always been favorite resorts during the winter for many persons of means and leisure who wish to escape the rigors of a Northern winter. While the number of this class of residents is increasing, Augusta has also participated in the industrial activity and growth which recently has followed a better recognition of the advantages possessed by the South for manufacturing purposes. These advantages include a lower cost of labor because of cheaper living conditions, low cost of power because of the many hydro-electric developments and freedom from transportation delays because of practical absence of snow. To these, in some instances, may be added proximity to the source of raw materials, as in the case of cotton mills and manufactures requiring the use of lumber and steel.

All of these conditions have helped the traction properties of the South. As opposed to them have been the increasing number of private automobiles and a climate which permits their use without difficulty for twelve months during the year.

Augusta suffers from this latter cause. Its main street is wide enough to permit two trolley tracks in the center, a line of parked automobiles on each side of the double track, at least two lines of moving vehicles on each side of these parked automobiles and, next to the curb, still another line of parked automobiles. There are, it is true, regulations limiting the period of parking, both against the reservation in the center of the street and along the curb line at the side, but if an automobile leaves its place before the end of its parking period, another is pretty sure promptly to take its place. Of course, the loss of traffic which has come from the competition with private automobiles has a theoretical maximum which now must have been nearly reached, because of the difficulty which the average driver finds in locating a parking place.

The principal transportation improvements on the Augusta system by the Augusta-Aiken Railway & Elec-



The Principal Street in Augusta Is Wide Enough for Two Tracks in the Center, a Row of Automobiles on Each Side of These Tracks, a Roadway Outside of These Parked Automobiles and a Row of Parked Automobiles Along the Curb



The Space Outside the Tracks Is Used for Parking Except at the Island Platforms

tric Corporation during the past few years are new cars, the addition by the city of several island platforms for waiting passengers and the construction of a dispatcher's office and information booth between the tracks at a central point in the downtown section. A representative of the company is stationed at this booth from 7:10 a.m. to 9:47 p.m. His duties are to make change and supply tokens to conductors, check schedules, issue orders to trainmen, etc. He is connected with other points on the system by telephone. All cars of the company, both city and interurban, pass this point.

The company uses 32 cars in its normal service. Fifteen of these are of the single-truck Birney type. Ten are double-truck safety cars made over from two-man

TABLE I—OPERATING EXPENSES PRINCIPALLY AFFECTED BY CAR MODERNIZATION, CENTS PER CAR-MILE

	1923	1924	1925
Power.....	1.12	0.84	2.07
Conducting transportation.....	10.92	8.74	8.68
Maintenance of equipment*.....	3.6	3.1	2.8

* Exclusive of depreciation.



This Dispatcher's and Information Booth Is on an Island Platform near the Center of the City

TABLE II—MAINTENANCE OF EQUIPMENT, EXCLUSIVE OF DEPRECIATION, CENTS PER CAR-MILE (Including accounts 29 to 38 inclusive)

	1921	1922	1923	1924	1925
City.....	4.9	3.9	3.9	3.1	2.7
Interurban.....	6.6	4.6	3.05	3.3	3.3
Average.....	5.6	4.1	3.6	3.1	2.8

cars and seven are used for the interurban division of the company. Of these seven cars, five are used for through business and have two-man crews. The others, which do only a local business for about 5 miles out from Augusta, are one-man cars.

The company's modernizing program for rolling stock during the last four years has brought material savings in operation, as the accompanying tables show. The first table gives the expenses for power, conducting transportation and maintenance of equipment, on the car-mile basis, for the past three years. The high cost for power in 1925 is due to the use of steam power during a long drought which occurred last summer. Table II gives data on equipment maintenance expenses.

As yet the company has put in service only one bus. It was supplied by the Yellow Truck & Coach Manufacturing Company and operates on the interurban route between Augusta and Aiken. In view of the large variety of fares charged on this line, the company has put in a National cash register for registering the fares.

The Readers' Forum

Cost of C., M. & P. S. Electrification Was \$22,000,000

CHICAGO, MILWAUKEE & ST. PAUL RAILWAY
Legal Department

CHICAGO, May 11, 1926.

To the Editor:

Today my attention has been called to erroneous matter contained in an article published in your issue of the 24th ult. under the caption "John D. Ryan offers intimate information."

The article, in dealing with the cost of electrification of the Chicago, Milwaukee & Puget Sound, states the cost of that electrification to have been \$200,000,000, whereas the fact is the aggregate cost was slightly over \$22,000,000. The third paragraph of the same article contains another error in figures in that the article states that the copper purchased by the railway company from the Anaconda company was worth \$5,500,000. The fact is that the cost to the railway company of that copper was \$3,900,000.

Your journal is read by persons who are technical and critical. The railroad management is at present being criticised, largely because of misinformation. As the representative of the Chicago, Milwaukee & St. Paul Railway, in charge of the proceedings involved in the Interstate Commerce Commission's investigation of why the road went into receivership, I am very much concerned in correcting misinformation and misleading statements. I am, therefore, bringing the foregoing to your attention in the confident belief that you will agree that in justice to your journal, to its readers and to the Chicago, Milwaukee & St. Paul Railway a correction of the April 24 article should be published in an early issue.

O. W. DYNES,
General Solicitor.

Maintenance Notes

Temporary Lighting Stands

IN RECONSTRUCTION work for electric railway operation it sometimes becomes necessary to provide temporary lighting of the streets due to disturbing the permanently installed lighting system. Such a condition exists along Eighth Avenue, New York City, where new subway construction is taking place. The permanent lighting fixtures have been removed and in their place have been substituted temporary lighting stands of the type shown in the accompanying illustration. These consist of a heavy base support with an upright constructed of 1-in. pipe. This is bent in a loop at the top and the lighting fixture is hung from this. The base is constructed of sheet steel and is 3 ft. square at the bottom. This tapers to an octagonal shape at the top which is about 12 in. across. The height of the base is 4 ft. In order to provide a solid anchorage for the upright pipe, the top is filled in with



Temporary Lighting Stand in Front of the Post Office on Eighth Avenue, New York City

concrete. This is easy to install and sets quickly.

The lighting connections are carried outside the base connection being made to the original lines. The junction box of sheet steel is installed on the upright 18 in. above the top of the base. This type of construction forms a cheaply constructed as well as a neat appearing arrangement which can be moved readily when work in the immediate vicinity is taking place.

Pneumatic Tires on Acetylene Welding Truck

IN WHEELING acetylene welding outfits about the shops of the Department of Street Railways, Detroit, Mich., it was found that the gages and welding equipment got out of adjustment due to the vibration when passing over rough flooring and tracks. To remedy this condition, the welding trucks of the railway are now all provided with



Pneumatic-Tired Welding Truck in Use in the Shops of the Department of Street Railways, Detroit, Mich.

pneumatic-tired wheels. The cheapest and most satisfactory construction is to use standard Ford front wheels. Old tires from the company's automotive equipment are used.

The framework for the truck is made of $\frac{3}{4}$ -in. pipe. This is bent outward at the top to form handles. A bottom step of $\frac{1}{8}$ -in. sheet steel is provided, on which the tanks are mounted. On the other side, a box of sheet steel is built into the construction, in which small welding equipment is carried, together with welding wire, etc.

Armature Failures Eliminated by Baking

NO MEAN record was established by the Beaver Valley Traction Company, New Brighton, Pa., when the entire winter of 1925-26 was passed without experiencing a single armature or field failure. This freedom from breakdowns was accomplished largely through the use of a bakeoven designed by H. J. Meyer, master mechanic, and equipped with Westinghouse heating units and automatic electric control.

Field coils are first placed in the oven and subjected to a drying out heat for a period of from eight to



The Base, Constructed of Sheet Steel, is Square at the Bottom and Octagonal at the Top



This Baking Oven Has Proved a Desirable Accessory to the Equipment of the Beaver Valley Traction Company

ten hours. They are then dipped and returned to the oven for the final baking. The latter process also requires from eight to ten hours, so that the preparation of the units extends over a period of approximately 24 hours. Thermostatic control maintains the baking temperature of the oven at 230 deg. F. Five heating units are provided, three at one end of the oven and two at the opposite end.

The oven is constructed of brick and access is through an opening with a sheet steel door. This door is arranged to raise and is counter-balanced so that its position may be maintained at any height desirable. Electric equipment for baking or drying is wheeled into the oven on a four-wheeled truck. The accompanying illustration shows some field coils in position for baking.

Turntable Speeds Sash Painting

CONSIDERABLE reduction in the time necessary for painting car sash has been made possible in

the shops of the Grand Rapids Railway, Grand Rapids, Mich., by use of a small turntable on which the sash is placed for painting. The base for the turntable consists of a wood block 2 in. thick. On top of this two round blocks, each of 8 in. diameter by 2 in. thick, serve as swiveling bearings. A round rod in the center acts as a shaft and the top framework can be lifted off for convenient handling.

The top consists of a central wooden frame about 18 in. square. This has side extensions which when closed are 33 in. over all and which can be pulled out to 48 in. over all. They are clamped in any desired position by wing nuts. Rubber spools form the support for the sash during painting. These are 1 in. diameter by $\frac{1}{2}$ in. thick. There are six of these on the center block and four additional spools on the extensions, one at the end of each arm.

A large number of different sized sash can be accommodated by this arrangement. The glass part of the sash rests on the spools during painting, so the entire frame is not touched. By rotating the frame the workman does not have to reach across the sash.



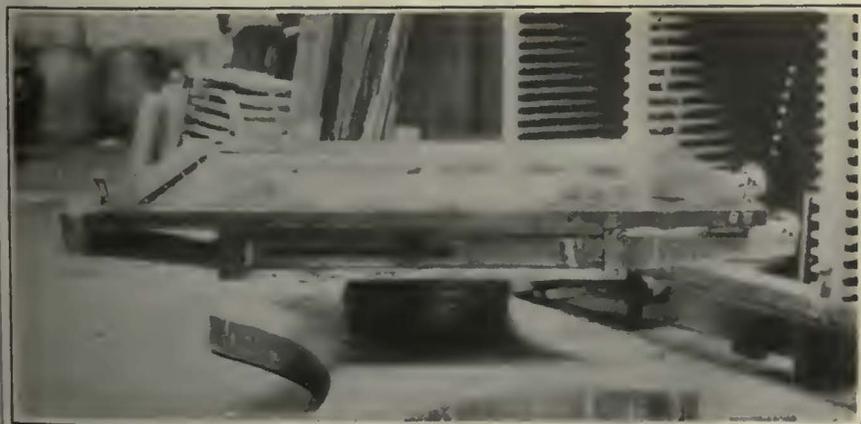
Improved High-Speed Circuit Breaker

DIFFERENTIATION between legitimate overloads and short circuits by automatic means requires many important details in circuit breaker design. The new type high-speed circuit breaker of the Westinghouse Electric & Manu-

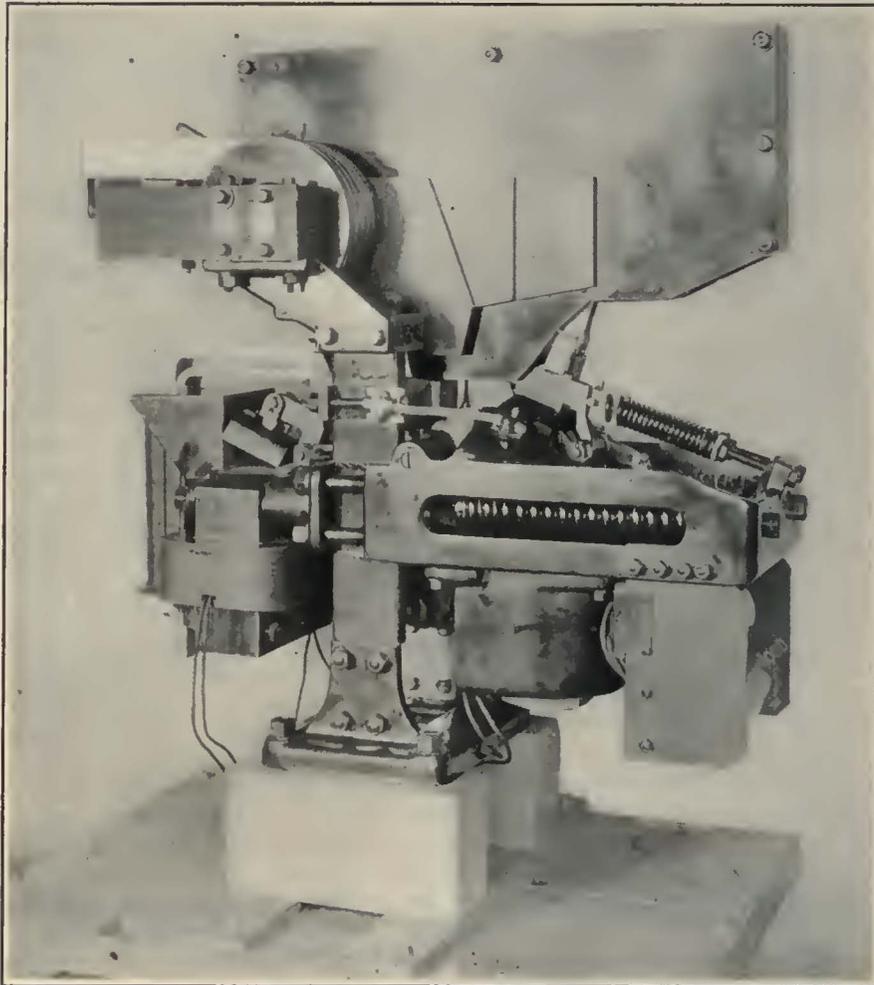
facturing Company is an air-break switch of the contactor type without auxiliary arcing tips. The breaker has a movable contact of solid copper bridging two stationary contacts. The movable contacts are held closed by the action of an electromagnet. Inside the breaker structure the path of the line current is divided into two parallel circuits. One is stacked with iron punchings to form an inductive circuit, while the second is non-inductive and is passed through the magnetic circuit of the breaker's "holding-in" coil, in such a manner that the flux due to load current bucks the flux of the holding magnet.

Under normal load conditions the holding coil flux predominates and the breaker is held closed against the action of strong springs and the currents in the two parallel paths vary inversely as the resistance of the paths. Under short-circuit conditions, one path being inductive, the current divides in the parallel paths inversely as their impedances. Therefore, the non-inductive path through the holding coil field will carry a much larger proportion of the short-circuit current and the holding coil flux will be bucked down, allowing the breaker to open instantly by the action of the opening springs held in tension by the holding magnet. A powerful magnetic blowout and an arc chute of ample size serve to lengthen the arc incident to the interruption of the circuit to a point of instability at such a high rate of speed as to dissipate it in a very short time. Under conditions of steady load or slowly changing load the inductive shunt has little or no effect on the current which divides between the two paths in the inverse ratio of their resistances.

The breaker is held in the closed position against the action of strong springs by the holding-in armature sealing to the holding-in magnetic circuit. To open the breaker the flux of the holding coil must be bucked down to such a value that the seal will be broken by the action of the opening springs. It is apparent that for given values of shunt resistance, bucking-bar resistance and flux of the holding-in coil, there is a certain value of excessive overload current that will buck down the holding-in coil flux and open the breaker. It is also evident that this value of overload current required to open the breaker will decrease in magnitude as the voltage on the holding-in coil is decreased. Due to its inherent de-



Convenient Turntable Fixture Reduces Labor of Painting Sash in Grand Rapids



Type HS 300-Amp., 1,500-Volt, High-Speed Circuit Breaker

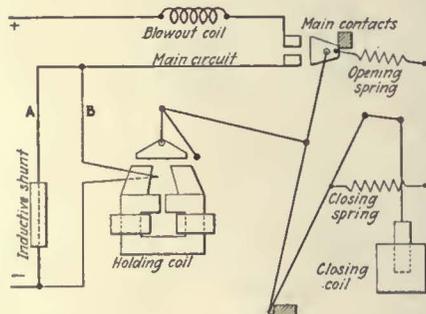
sign characteristics the high-speed breaker will open on short circuits and excessive overloads.

The division of current between the bucking-bar and shunt, the holding coil flux and the inductance of the shunt circuit is so proportioned that the breaker will not open at overloads within the capacity of the machine. The features of the automatic switching equipment are so designed that load-limiting resistance is inserted in the machine circuit with overloads to limit the output of the machine to within its rated capacity. Therefore, the slowly rising overloads are automatically

limited before they reach a value great enough to open the breaker.

High-speed breakers are designed essentially for machine protection and should be connected in the machine circuit with its holding-in coil excited from the machine voltage. Under operating conditions the breaker will be supplied with normal voltage, thus making it possible accurately to adjust the tripping mechanism so that the breaker will differentiate between short circuits and legitimate overloads, opening only on short circuits.

When high-speed breakers are used in feeder service it is necessary to excite their holding-in coils from the station bus unless an expensive storage battery or motor-generator set is supplied for that purpose. Under such conditions the breaker is operating with an impressed voltage on its holding-in coil that may vary as much as 100 to 150 volts as the load-shifting resistances are cut in to lower the bus voltage and transfer a portion of an overload to adjacent stations. If the breaker is calibrated to select between legitimate overloads and short circuits with normal



Diagrammatic Sketch of High-Speed Circuit Breaker Connections

bus voltage impressed upon its holding-in coil, it is evident that the breaker will open on heavy overloads when the bus potential has been reduced appreciably by the insertion of the load-limiting resistance, thus interrupting the circuit when it is most important that the feeder breaker should remain closed.

Tilting Frame for Motor-Driven Saw

WITH the driving motor and saw blade mounted at opposite ends of a tilting frame, a high-speed circular metal cutting saw has been designed by the Hunter Saw & Machine Company, Pittsburgh, Pa. A double-jaw, quick-acting, eccentric vise is used to hold the material firmly during the cutting operation. The table of the machine is provided with a quadrant stop that can be set



High-Speed Metal Cut-Off Saw

to any angle within the sweep of the saw blade. A pan is attached to the under side of the table to catch cuttings and so aids in keeping the shop in neat condition.

Adequate protection to the operator is provided by means of steel guards that cover both the belt and saw.

The machine is driven from a Westinghouse Electric & Manufacturing Company's motor, through an endless belt. A push-button-controlled magnetic starter is used for the control of the motor. Proper alignment of the pulleys is obtained by having the motor keyed to the base, the handwheel providing for convenient belt adjustment. The low belt tension which is a particular feature is provided through a wide belt.

Association News & Discussions

Dimensions for Carbon Brushes and Shunts Listed

SIMPLIFIED lists of sizes and dimensions for carbon brushes and brush shunts were established by the division of simplified practice of the Department of Commerce at a meeting held in Washington on April 14, 1926. This conference included representatives of manufacturers, distributors and users of carbon brushes and brush shunts, and was held at the request of the Electric Power Club in an endeavor to determine reasonable size limits within which one dimension might vary in respect to another fixed dimension.

It was the sense of the conference that a standing joint committee be organized which will include representatives of all elements of the industry and whose function will be to observe the adequacy of the recommendations now adopted through the first active year. The first concern will be to give further study to many important suggestions that were developed at the meeting. The standing committee will

consist of two representatives of brush manufacturers, two representatives of the motor and generator manufacturers, two representatives of the retailers and two representatives of the users.

It was the opinion of the conference that close co-operation between the manufacturers of carbon brushes and the fabricators of brush holders will prove advantageous to both groups, with the result that further simplification will appear desirable and practicable at some future time. The conference also felt that engineers, designers, purchasing agents, superintendents and standardization bodies, who are in any way concerned with carbon brushes and brush shunts, will derive tangible benefits from a simplified list of sizes. Such practice should decrease stocks, production costs, selling expenses, misunderstandings, etc. The American Electric Railway Association was represented at this conference by R. H. Dagleish, chief engineer Capital Traction Company, Washington, D. C.



Trolley Line of the Port Arthur Traction Company with Creosoted Pine Pole Construction Installed in 1911 Has Had No Replacements to Date

Creosoted Pine Poles*

By H. E. BRAUNIG

Superintendent of Transmission and Distribution Eastern Texas Electric Company
Beaumont, Tex.

STRENGTH tests on wooden poles were conducted by the American Telephone & Telegraph Company in 1924 and by the United States Forest Products Laboratory in 1923. Each of these authorities found that pine is the strongest of the pole woods. Bulletin 556 of the Department of Agriculture lists it as 44 per cent greater in strength than the next strongest species, and this comparison was verified by the work of the Forest Products Laboratory.

In line construction, practical advantage is taken of the increased strength of pine, either by using smaller poles or by using longer spans. Three years ago our company adopted pine exclusively and in general we now use all poles 1 in. less in top diameter than formerly when other species were used. Pine maintains its strength over a long period. Tests made during the last eighteen months on creosoted pine poles 27 years old show that there was no decrease in strength.

The life of creosoted pine poles has been variously estimated at from 25 to 40 years. The Pennsylvania Electric Association's report in 1923 gives the anticipated life as 35 years. A recent paper by the Carolina Light & Power Company gives a life of 40 years. One of our oldest lines between Port Arthur and Beaumont was built in 1912. In

its construction 652 poles were used. To date, three of them have been replaced due to decay, caused, so far as can be determined, from abrasions. Practically no decay has occurred at the ground line or top. Another line between Dallas and Sherman, Tex., was built in 1909 and contained 2,400 poles, none of which has been replaced. There is no doubt that the present-day application of the treating process is much better regulated and more scientifically handled than with these older pole lines. It therefore seems safe to assume that the treated pole itself is an even better product than we have hitherto obtained.

The conductivity of the wood is not increased by creosoting, and due to deep penetration of creosote it is a toxic to white ants. Impregnation by the full cell process with coal tar creosote renders wood resistant for at least 25 years.

Creosoted wood when new is more readily inflammable than untreated wood, but when it becomes older it is less inflammable.

Birney Club to Discuss Obsolescence

WHAT Constitutes Obsolescence in Street Cars" will be the subject of a paper by W. J. Mackle, superintendent American Car Company. This will be presented at the next meeting of the Birney Club, to be held in St. Louis at 6:30 p.m. on June 7.

COMING MEETINGS

OF

Electric Railway and Allied Associations

June 2-4—Canadian Electric Railway Association, annual convention, Quebec, Canada.

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.

*Abstract of a paper presented at the sixth annual convention of the Southwestern Geographic Division of the National Electric Light Association, Galveston, Tex., April 15, 1926.

The News of the Industry

Rapid Transit for Seattle

Committee of Laymen Sees in Rapid Transit System a Cheap Solution for Present Difficulties

One hundred and six pages of type-written text and a dozen pages of artist's sketches are used by the rapid transit committee of Seattle, Wash., to tell why that city needs rapid transit. The report is summarized in twelve findings and two recommendations abstracted herewith. The report is signed by William Pitt Trimble as chairman of the committee of five citizens.

According to the committee the "street car business" in Seattle is falling off at the rate of about 1,000,000 passengers yearly, notwithstanding that the population during the last fifteen years has more than doubled.

The members say that the multiplication of street traffic during the last fifteen years in the downtown sections of Seattle and other cities of this class has demonstrated the impracticability of surface cars providing cheap and quick transportation in competition with the automobile. In the six years from 1919 to 1924 the number of trolley car passengers across the draw-bridge fell off 21 per cent, while the number of automobile passengers gained 181 per cent. During the same period, in cities supplied with rapid transit lines, the business has increased faster than the population. Says the committee:

Trolley car service is too slow. The rapidly moving "jitney bus," with its miserable accommodations, took so many thousands of passengers from the trolley cars that jitney competition had to be suppressed by law, but this legal suppression of public competition had only a temporary effect upon the decline in trolley car business.

According to the board, the experiment in 1923 of lowering fares immediately added 12 per cent to the number of passengers, but a 5-cent fare cannot be maintained, because trolley cars cannot be operated for much or any less than the present fares. Still, says the board, the fares are too high. It believes that buses will not remedy the situation, for with "their limited carrying capacity it would take so many more of them than trolley cars to do the business that they would add to the situation instead of relieving it."

With the innumerable crossings, necessary and unnecessary stops, cross-traffic and other interferences, buses cannot make the required time through crowded areas, nor expeditiously and economically move large masses of people. That is the committee's opinion. In consequence "a rapid transit system is the only solution and is necessary" to meet the demand for quicker, cheaper, more regular and more comfortable service than can be given by either the trolley car or the automobile.

It submits its plan as the only prac-

ticable solution of the local problem. In this connection it finds:

That the system can be built for less than \$4,000,000.

That the gain in business and the saving of time in operating costs would be enough to pay the interest, etc., upon the cost of construction.

That it will be a great saving of money and time to the traveling public, amounting to about 6,000,000 hours annually, and this, estimated at the nominal value of 10 cents an hour, is an unnecessary tax upon the street car users of \$600,000 a year, which loss can be saved by the proposed rapid transit system.

That the first unit would serve about 40 per cent of the population and would have to add only 2 per cent to the value of this 40 per cent of the assessed value of the city to pay for itself in one year.

That the information broadcasted that Seattle was the smallest city in the country and the first city west of Chicago to have rapid transit would be of tremendous advertising value to the city.

That it is the city's duty to see that the people have cheap, quick and comfortable transportation facilities.

That the longer the construction of the system is delayed the greater the loss of business, the cost of construction and the difficulty of financing.

For these reasons, or, as the committee prefers to say, "now, therefore, your committee recommends as follows":

1. That the city itself should at once proceed to provide proper facilities, or
2. That it should go out of the business and grant such a franchise to a private company, so that such company could furnish more rapid, regular, frequent and cheaper service and facilities to the traveling public; otherwise, the only way the surface roads can ultimately escape the bankruptcy court is by placing this unnecessary burden upon the already overburdened taxpayers and without any benefit to the railway department or to its patrons, or to the credit of the city.

Bus Company Contracts to Buy Railway

Fifth Avenue Coach Company Plans to Take Over 74 Miles of Surface Lines, Renews Its Plea for Bus Rights and Offers to Install Five-Cent Zone System

TWO major and several minor moves have been made involving the affairs of the New York Railways, operating 74 miles of surface lines in the Borough of Manhattan. First, the Fifth Avenue Coach Company has contracted to buy the railway. Second, control of the Fifth Avenue Coach Company, which operates the Fifth Avenue bus system, has passed from a group of Chicago capitalists to a group of New Yorkers. Third, bondholders of the New York Railways have voiced opposition to the plan advanced for the amortization of the bonded indebtedness of the railway under the plan advanced for the substitution of buses for parts of the railway system which it is deemed advantageous to supplant. Fourth, the railway made a bid to operate buses on a 5-cent zone basis. The third of these developments is the outgrowth of the others.

Announcement of agreement to purchase the control of the New York Railways Corporation by the Fifth Avenue Coach Company was made on May 23 by Hugh J. Sheeran, president of the former company. In his statement Mr. Sheeran repeated the willingness of the surface car company to surrender the perpetual franchises to some of its lines for a bus franchise and to tear up its tracks on certain streets and avenues and to substitute buses.

It appears that on May 19 the board of directors of the Fifth Avenue Coach Company, subject to the approval of the Transit Commission, ratified the agreement for the purchase of the common stock of the New York Railways. This marked the first important step in a new policy due to the passing of control of the Fifth Avenue Company from the Chicago group, which acquired

it nearly two years ago, to various New York men.

These interests are represented, among others, by David A. Schulte, W. A. Harriman & Company, J. & W. Seligman, Grayson M.-P. Murphy, Charles H. Sabin of the Guaranty Trust Company, Elmer Schlesinger of Chadbourne, Stanchfield & Levy, Harry Bronner and John A. Ritchie, president of the Yellow Truck & Coach Manufacturing Company. These interests are now in control of the Omnibus Corporation, which owns the New York Transportation Company, which in turn owns all the stock of the Fifth Avenue Coach Company.

Mr. Sheeran says that if the Transit Commission shall approve of the proposed purchase the initial step will have been completed in a plan which contemplates complete and fully modernized motor coach service for the island of Manhattan.

According to him, in developing such a plan, there are certain local problems peculiar to New York city which are both of a legal and an operating character. As is well known the principal north and south streets of Manhattan are for the most part already occupied by street car tracks which were laid and are now operated under the terms of perpetual franchises. So Mr. Sheeran points out no comprehensive bus system can be operated which does not involve the use of streets where railways are now operating.

The New York Railways has such franchises on Broadway, Sixth Avenue, Seventh Avenue, Columbus Avenue, Lexington Avenue and Lenox Avenue, as well as on Spring Street, Eighth Street, Fourteenth Street, 23d Street, 34th Street, 116th Street and other

streets. It, therefore, has franchises for street car operation on thoroughfares which would be indispensable to any comprehensive motor coach system.

Mr. Sheeran said:

The New York Railways, by reason of its existing franchise rights, is in a peculiarly favorable position to co-operate with the city in extending and improving the city's motor coach service. It can promptly install an efficient service, operated by a thoroughly trained and expert transportation management and personnel. Its official and executive staff are expected to remain as at present.

Since it is already equipped with buildings suitable for garage purposes, shops, etc., it will be in a position, because of the additional facilities at its disposal, to furnish the service in the shortest time possible, much of it at once and all of it within a period of, say, 120 days after getting a legal franchise. This applies to the lines laid out by the city authorities for Manhattan and for which the Manhattan Surface Coach Company has filed the necessary application.

In all of these proposed operations of the Manhattan Surface Coach Company the plan contemplates an arrangement by which the company will have the benefit of the experience and knowledge of the Fifth Avenue Coach Company and will receive active co-operation of the management of that company, which already has large manufacturing and maintenance shops in the city.

The plan of the Manhattan Surface Coach Company provides for a temporary service at once in the important territory of Manhattan lying west of Madison Avenue by making provision that until motor coach service can be operated in that section of the city, the motor coach lines of the Manhattan Surface Coach Company will transfer passengers to Sixth Avenue, Seventh Avenue or Broadway street car lines.

The company is prepared also, in the event the city authorities so desire, to enter into an agreement involving the substitution of motor coach operation for railway operation on Sixth and Seventh Avenues. In other words, as Mr. Sheeran has expressed it, "whatever plan would seem to the city authorities to be in the public interest, the New York Railways is prepared to co-operate in bringing it about."

As an evidence of the willingness on its part the company says it is ready at once to substitute motor coaches for street cars not only on Sixth and Seventh Avenues, but also on Columbus Avenue and on the Eighth and 116th Streets crosstown lines. Not only that, but Mr. Sheeran says that "if it be the desire of the city that all of the street car tracks in the New York Railways system shall be removed and the company be given the right to operate motor buses on these thoroughfares the New York Railways is ready to enter into negotiations to bring this about."

As the sponsors of the plan see it, the proposal provides for the inauguration of a comprehensive motor coach system without incurring vexatious and prolonged litigation which would necessarily arise were any attempt to be made to set up an omnibus service on the same streets where street car lines are now operating under conditions which do not give the owners of such property a fair return on their investment. According to them the plan would also mean the setting up of a complete and comprehensive system which the city could take over for municipal ownership and operation, if such

a policy were at some future time determined to be wise.

Hardly had the ink dried on the papers that contained this statement than bondholders arose to ask, in effect, "What about us?" A spokesman for the Broadway & Seventh Avenue bondholders said that the proposal to substitute buses for street cars on Seventh Avenue had not been approved by these bondholders and that they were prepared to fight any such step. He asserted that bondholders' committees would be formed if they were not assured that what they considered their rights would be protected. The objection of the bondholders to the substitution of buses for street cars on Seventh Avenue is based on the belief that the motor vehicles would not prove as profitable on this thoroughfare as do street cars. They hold that for this reason it would be unwise to relinquish perpetual franchises in return for short-term bus franchises. There is a minority stock interest in the Broadway & Seventh Avenue Railroad which the bondholders claim will support them in opposition to the plan. The Broadway & Seventh Avenue bondholders also believe they will win support from Bleeker Street and Fulton Ferry 4 per cent bondholders and minority stockholders, Twenty-third Street Railway 5 per cent bondholders and minority stockholders and Thirty-fourth Street Railway 5 per cent bondholders. These properties in the New York Railways system have never defaulted on bond interest.

COUNSEL PROMISES CONSIDERATION FOR BONDHOLDERS

To this expression of concern Elmer Schlesinger, of counsel for the Fifth Avenue Coach Company, said that the matter of caring for bondholders has seemed a question so much of the future that "we have not given it much consideration." He said:

I have not even looked into the terms of the mortgage on which the Broadway & Seventh Avenue Railway bonds were issued. We intend, of course, to meet all legitimate claims of bondholders.

In previous plans for the substitution of buses for street car lines it was proposed to determine the actual value of the railway property and then to amortize bondholders' claims through payments extending over the suggested period of the bus franchises, which was for twenty-five years. This plan provided a means of discharging bond obligations without the need of a large initial cash payment.

Abandonment of street car lines under the plan of the New York Railways Corporation would not take place immediately, even if the plan were to meet with official approval. If and when the time comes for satisfying the claims of bondholders they would likely be met on the basis of a fair valuation of the property involved rather than on the face value of the bonds.

As an alternative to its plan for bus and surface car operation the New York Railways has made a bid for operation of buses in Manhattan on a 5-cent fare, zone system basis, similar to one made by the Third Avenue Railway through its subsidiary.

The new proposal was disclosed by Mr. Schlesinger, who made the announcement in commenting on plans to block dismantling of surface lines outlined by a spokesman for Broadway & Seventh Avenue Railway bondholders.

As outlined by Mr. Schlesinger, the reasons for the submission of the 5-cent zone plan bid were substantially those described by S. W. Huff, president of the Surface Transportation Company.

Both interests feel that a unified bus and street-car system operated on a 10-cent fare basis is most suitable for the needs of New York City, but that the zone system provides a method of establishing a 5-cent fare should this be considered indispensable.

Former Mayor John F. Hylan declared that it looked as though the machinery had been oiled to put over one part of the deal of which he talked during his last campaign. He also criticized Governor Smith for signing a bill to permit a bus company to buy the stock of a surface line company, and former Comptroller Charles L. Craig for activity in the transit situation.

Mayor Walker, in commenting upon his predecessor's statement, said:

We are not trying to please one individual. The effort of this administration is to satisfy six and a half million people with proper transportation. Especially we are not trying to satisfy an individual who with eight years of opportunity did nothing.

As indicated previously, the New York Railways system now has approximately 74 miles of single track. The company carried 148,105,561 passengers last year. It has \$37,432,472 in bonds outstanding and 184,830 shares of preferred and 90,200 shares of common stock.

Richmond Franchise Up to Mayor

The blanket traction franchise for the operation of the Virginia Electric & Power Company, Richmond, Va., is now up to Mayor J. Fulmer Bright. The Board of Aldermen, after brief discussion and explanations by Alderman Ordway Puller, chairman of the streets committee of the City Council, on May 25 adopted the paper without amendments. Alderman Joseph C. Nunnally sought to amend the section relating to an underground system for Broad Street, and Alderman Charles W. Moss desired to amend so that the traction company would be required to pave all streets from which tracks may be removed. Both amendments were lost, and then the paper was concurred in with but one dissenting vote, that of Alderman Nunnally.

The franchise provides for a 7-cent fare; the company to pave and repair between tracks and 2 ft. on either side; the company to pay 5 per cent of gross revenue as tax for the first year, this sum to diminish annually for ten years until it reached the low point of 3 per cent, to remain at that figure during the life of the franchise; the present owners to sell to the successful bidder for the franchise at a valuation of approximately \$9,500,000; the city to take over, within a period of five years, the various viaducts free of cost; the elimination of duplicate lines, and extension of others, the extension of the Seventh Street tracks from Clay to Leigh Streets (one block), for possible extension of the interurban (Richmond and Petersburg) line to Seventh and Leigh Streets, as the terminal.

The concurrence in the paper by the Board of Aldermen, the Common Council previously having adopted the ordinance, is the culmination of long-drawn-out discussion. The franchise as finally agreed upon is considered by all concerned as a compromise. The streets committee conceded certain points and the traction company conceded many.

The result, it was shown, received the approval of every member of Common Council and eight members of the Board of Aldermen.

June 2 has been set as the date for consideration by the streets committee of the City Council of the new bus ordinance, under which the Virginia Electric & Power Company will operate its fleet of automobile passenger buses. General provisions of the measure have been agreed to, it is understood, and it is hoped to have it operative within a short time. The bus service will be operated in co-ordination with the electric car routes.

Traction Discussion Renewed in Chicago

Service at cost in the high point of the present deliberations of the committee on local transportation of the City Council of Chicago with regard to the drafting of a new traction and subway ordinance.

Believing that the scheme would encourage economic management of the surface and elevated lines, tentative approval has been given to a plan brought forward by Corporation Counsel Busch which would reduce the rate of return whenever fares are increased and increase the return when fares are decreased. In order to determine the cost of service, 2 per cent of the valuation of the surface lines properties, or approximately \$3,200,000, would be set aside with the initiation of the plan. This fund, called a "barometer" or stabilization fund, would take care of all operating deficits. Should the fund fall below 1 per cent of the valuation, fares would be increased 1 cent automatically. Likewise, if the fund should reach 3 per cent of the valuation, fares would be automatically cut 1 cent.

The committee is definitely agreed that before new franchises can be granted to the surface and elevated lines, unification of service must be brought about. Because of the varying maturity of the outstanding traction securities, however, consolidation of ownership will not be demanded.

Before the committee adjourned on May 25 to await the appearance of representatives of the companies, approval was given to the recommendation of Major R. F. Kelker, the committee's engineer, that the surface lines be permitted to reduce the height of their rails from 9 in. to 7 in. In return for this privilege, which Major Kelker declared would result in large savings in construction costs, the surface lines would be required to pave their rights-of-way a width of 18 ft. instead of 16 ft. In addition, the committee concluded that eight-tenths of 1 per cent of the gross revenue of the companies should be set aside for payment into the amortization fund.

To control the operation of the traction lines under the projected ordinance, the committee has also indorsed the formation of a committee of five members, each of whom shall be appointed by the Mayor for a term of five years. Qualifications for membership, it was decided, shall provide only that the appointees be persons of business ability and public spirit and in no way connected with the traction companies.

General Strike Failed to Halt Service in Great Britain

Independent Bus Operators and Volunteer Railway Workers Provided Transportation Facilities Sufficient to Prevent Tie-Up During Recent Industrial Conflict



Independent Buses Operating in London During the Strike Were Overcrowded by Non-Striking Employees Anxious to Get to Work

TRANSPORTATION service throughout Great Britain was much impaired during the general strike, May 4 to May 11, but it never was completely halted. In London particularly, and to a lesser extent in other cities, the facilities provided by the independent bus operators were an important asset to the public in the first days of the strike. Volunteer drivers were quickly secured by the established bus undertakings, however, and extensive operations resumed before many days elapsed. Similarly, volunteer workers were instrumental in restoring service on the rapid transit lines and on the electric and steam railroads. Tramway service was hard hit, but the return of many trainmen eventually permitted the resumption of a considerable part of the service.

In the past there had been much talk about a general strike in England, but

the call issued on May 4 by the executive council of the Trades Union Congress in support of the coal miners was the first actual attempt to carry out the threat. Both rail and road transport personnel were seriously affected. Other industries involved, besides that of coal mining, which was the underlying cause of the trouble, were iron and steel, building construction, printing, and to some extent engineering and electric power generation. The total number of workmen on strike was estimated between 3,000,000 and 4,000,000.

In fear that some such effort might be made, the government had prepared in advance and was ready with an organization for the transportation of food supplies by rail and road. Passenger transportation services had not been so thoroughly arranged and were seriously disrupted at first.

When transport stopped, the problem

of getting to and from work was much more serious in London for those not on strike than it was anywhere else in the country. This was because of the greater size of the city and the consequently greater distance between homes and places of employment. The main thoroughfares leading to the central business area were thronged morning and evening with hundreds of thousands of people going to and returning from work. The greatest number were on foot, but many had bicycles, and an astonishing number had motor cars. Never before had such multitudes of automobiles been seen in London streets.

The large Chelsea power station of the Underground railways was shut down and the whole system became dead. In a few days, however, sufficient men were found to start up the station again, and limited services were running on several of the tube lines. The London tramway and bus services were completely closed except for the independent bus operators who continued to run despite threats from strikers. The London General Omnibus Company got some buses on the street by the end of the week and some of the suburban tramway authorities began to run cars. Riots and sabotage were threatened when the London County Council attempted to operate its cars..

By Monday, May 10, a week after the strike began, a marked improvement had occurred in the means of passenger transport in London. There was no general breakaway of strikers, but the Underground railway companies and the London General Omnibus Company had been busy training volunteers to be drivers and conductors of trains and buses, and others for the duties of operating the Chelsea power station. In the last-mentioned work many engineering college students were quickly able to render valuable assistance. There were several hundreds of L. G. O. buses on the streets and the number of independents had also increased over the previous week.

Many special constables were recruited for whole-time work with pay, a large proportion of whom were employed for the protection of tramcars and buses from interference by strikers. In many instances a policeman or special constable sat beside the driver, but



A Group of Cheerful Volunteer Bus Operators Recruited by the London General Omnibus Company

cases of malicious interference were not numerous. The underground railways returned to something like normal services for a large part of the day. The London County Council Tramways, however, showed little signs of revival, as earlier attempts to bring out the cars had resulted in broken windows. Considerable rioting took place at Glasgow, Hull and some other industrial centers. In all districts where prosecutions took place for interfering with traffic or rioting the magistrates inflicted severe sentences of imprisonment.

The suburban electrified lines of the large steam railroads also got to work and, so far as electric railways and buses were concerned, the London travelers' troubles were sensibly diminished. Elsewhere tramway and bus service began gradually to be restored.

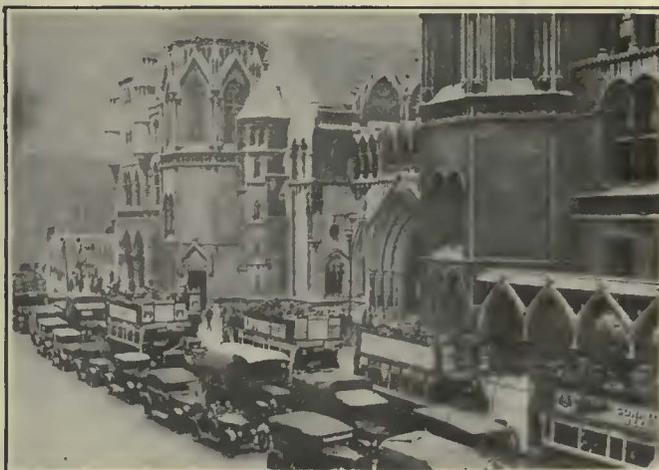
On Tuesday, May 11, bus service in London was still further increased. The London General Company for the time being dropped graded fares and displayed on its buses the notice "Fare 3d. for any distance." The County Council tramway system remained dead, but in the provincial cities many tramway and bus employees returned to work. Normal services were practically restored in Portsmouth, Bristol, Newport, Cardiff and other towns, largely on account of the return of men, but to some extent

also through the agency of volunteers. In various towns warnings were issued to tramway employees that if they did not return to duty by an early date they would be discharged. Of even more importance in inducing the men to return, however, was an official announcement signed by the Prime Minister declaring that every man who did his duty by the country and remained at work or returned to work during the crisis would be protected by the government from loss of trade union benefits, superannuation allowances, or pensions. The government would take whatever steps were necessary, it was said, whether Parliamentary or otherwise, to accomplish this purpose.

On May 12 the strike was called off by the Trades Union Council and two days later terms were arranged for the return to work of the employees of the London underground railways, the London tramways and the London General Omnibus Company and its associates. At first there were rumors that men were only to be taken back at reduced wages, but these proved without foundation. It was announced, however, that the employers made stipulations similar to those made by the steam railway companies, that the men would be taken back as soon as traffic warranted and work could be found for



More Motor Cars Were Seen in London Streets During the Strike than Ever Before. This Shows Victoria Embankment Looking from Waterloo Bridge at 10:30 A.M.



After a Few Days the London General Omnibus Company Was Able to Resume Partial Operation. Traffic Passing in Front of the Law Courts During the Morning Rush

them. It was also arranged that volunteers who had helped the services in their emergency would continue to be employed should they so desire.

The electric railways, both underground and suburban, did not get back quite to full services at the week-end, but on the 15th something like normal traffic was restored. The London County Council tramways, resumed operation on some routes on the afternoon of the 14th, and on the following day were coping with public demands.

Elsewhere in England and in Scotland in a number of large towns where a certain proportion of tramcars and buses had been running during the strike communications were rapidly improving. In other places there were local disputes as to terms of reinstatement, and a condition that only non-union men would be employed was spoken of. Everywhere, however, there was every prospect of normal work being speedily resumed.

During the strike the order issued some time ago under the London traffic act reducing the number of bus trips on certain routes was not enforced. Although intimidated by the strikers, the so-called pirate buses continued running, and thereby earned the gratitude of the public. It is thought that this may stand them in good stead when the restriction question comes up again.

Enabling Act Passed in Massachusetts

Governor Alvin Fuller of Massachusetts on May 26 signed the bill which will enable the New York, New Haven & Hartford Railroad to acquire and hold the securities and properties of the New England Investment & Securities Company, the Springfield Railways, the Springfield Street Railway, and the Worcester Consolidated Street Railway. The amendment proposed by the Governor when he returned the bill to the Legislature was compromised and rewritten to provide that the act to become effective must be accepted by three-quarters of the cities served by the railway companies. The municipalities on the lines number 49.

Need for Changes in Louisville Grant Stated

The Louisville Railway, Louisville, Ky., published a page advertisement on May 22 in the Louisville *Herald-Post*, carrying a letter signed by President J. P. Barnes, addressed to Mayor A. A. Will. Mr. Barnes said the ad would be followed by a series of six letters which will be published in the newspapers, starting on May 24. He said:

You are already familiar with our situation regarding extensions to the transportation system of Louisville. A very considerable pressure has been brought upon us in many directions to make extensions, and we find ourselves unable to do so, because the investors in public utility securities are unwilling to advance money to the Louisville Railway for extensions, so long as the restrictive provisions of the present ordinance obtain.

Specifically, what the investor requires is a security equivalent to that which he finds in the offers of companies under federal regulation, or under the regulation of the 43 states which have public utility laws. All of these jurisdictions base rates for public utility services on a reasonable return on a fair value of the property devoted to the public use. This basis guards as effectively as anything can against the

emergency conditions which might arise in an economic crisis like the one accompanying the World War, and to this extent the investor is in a position to demand, and he does demand, protection for his investment in public utility securities.

We feel that the modification of the railway company's ordinance in this sense would be of enormous benefit to the system in permitting us to command funds for needed extensions, and that the control over rates of fare which could and should be retained by the city, subject only to a reasonable return rule, would amply protect the public against extortionate fares. There is no present necessity for an increase in fare, nor do we see a prospect of

such necessity. It is merely the unforeseen against which the investor demands protection.

We feel that the retarding of the city's growth through our inability to make transportation extensions is very considerable and of very great importance, and have therefore prepared a series of six letters, which will be published in the newspapers commencing next Monday. We have tried to state the situation concisely, correctly and convincingly.

We feel this matter to be charged with a public interest and concern so grave that we are making this preliminary letter to you open so that the public may not be uninformed as to any step of our program.

Strike in Akron Called Off

Former Employees Sue for Peace—Accept Individual Contracts and Return Under Old Working Conditions—Buses Commended—More Car Lines to Go

CARS are again running as usual on the city, suburban and interurban lines of the Northern Ohio Power & Light Company, Akron. The strike is over. It was called off on Saturday afternoon, May 22, at the suggestion of Amalgamated officials, and complete service was resumed Sunday, May 23.

The strikers who were acceptable to the company were taken back as individuals. They signed individual contracts and accepted seniority rights behind the men working Saturday, May 22, at the same pay and under the same working conditions that existed May 1, the date the strike was called.

When the strike was called off the company had established complete city service in Akron and Canton and interurban service between Akron and Massillon. Many men had also been employed for use on the Akron-Cleveland division and the Akron-Warren-Alliance lines commencing on May 24.

The strike was called off following a request on May 21 from W. K. Jones, an old employee, that the company state the terms upon which the striking employees acceptable to the company would be taken back. Jones was supplied with the information and then suggested a vote on the proposition. The vote showed a majority in favor of ending the strike and accepting the terms laid down by the company. Many new men have been hired since May 1, so the company is unable to use all of the former employees who are acceptable. They are re-employed on a basis of their past record.

As an aftermath of the strike four strikers are to be prosecuted on a federal charge of attempting to block United States mail. The men attempted to stop a Canton-Akron train carrying mail Thursday, May 20, near North Canton. Three other strikers are being sought on dynamite charges. All prosecutions will be pushed to the limit.

When the strike was ordered on May 2 by Edward McMorrow, vice-president of the Amalgamated Association, the organization "went to bat" against the most powerful bus system ever gathered together in a city of 200,000 and against public sentiment, as well as one-third of the Akron city employees who were not members of the union.

In five days Akron city service had been increased from the skeleton system in operation Sunday, May 2, to

normal. The company then turned its attention to Canton, and in four days more had restored practical normal service there despite the laxity of co-operation on the part of the police department.

Tuesday of last week interurban service began to be restored and the climax of the strike followed shortly, with a series of dynamitings, minor riots in Canton and lesser disorders in Massillon, where no attempt was made by the police to protect trainmen who were working. The company went into the federal court Thursday and began injunction proceedings against the Amalgamated Association, its officers and members. Then came the arrest of the rioters.

All attempts toward mediation were rejected by the company. This stand met with general public approval. Hugh D. Friel, representing the Department of Labor, and Herman R. Witter of the State Industrial Department were the most active in the work of trying to effect a reconciliation. One Congressman tried his best to bring about a conference, as did four ministers and two city Mayors. All failed and the company sat tight in its determination not to deal with the union or union representatives. It remained for an employee long in the service of the company to secure the best terms.

The aces of the Amalgamated official board were called to Akron during the strike. Edward McMorrow, veteran strike leader, was the first on the ground. Then came Albert Jones, another experienced vice-president, and lastly came Patrick J. O'Brien, also a vice-president of the Amalgamated. Public sentiment was so strongly in favor of the company in its determination to break union domination that none of these men could get a foothold. They were rebuffed at every turn. Prominent residents of Akron and Canton called company officials on the telephone and wrote letters urging the company not to compromise with the union. "We have suffered enough from strikes in the past; end this one right," was the public stand. In Akron city and Summit County the authorities preserved order from the first day. No crowds were permitted to congregate in the street and an attempted parade of union men and women was blocked.

The people served by the city lines of the company have suffered great inconvenience from strikes during the

last twelve years. Always the Amalgamated Association, through public aid, has forced a satisfactory union compromise. This time the union found a different public attitude, with the result that the union is today a wreck.

The strike has shown the company that a more satisfactory transportation service can be given along certain car lines with buses. It is, therefore, possible that the Bowery, North Howard and Grant Street car lines will soon be discontinued. It is probable, too, that the Massillon City system will soon give way to a bus system. The company has not been hurt materially by the strike. Little damage was done to equipment, while bus revenue has almost kept up to the car revenue. The strike expense was small and the general feeling is that so far as value is concerned the result far exceeds the cost.

No strike breakers were employed. Practically all men who operated cars were either regular employees or men who resided in Canton or Akron. A few experienced men who of their own accord came to the property from other cities were employed.

Wage Negotiations Under Way in Boston

Negotiations are in progress over a new wage agreement between the Boston Elevated Railway, Boston, Mass., and the union. The old agreement expires on July 1. The conferences are being held at the general offices of the company. John H. Reardon, general representative of the Amalgamated Association, is assisting the carmen's committee and Edward Dana, general manager of the Boston Elevated, is sitting with the Elevated board of trustees in these negotiations. They have not proceeded far enough to authorize the publication of any of the terms they are discussing.

Present Scale Accepted in New York State

Employees of the New York State Railways in Rochester, Syracuse and Utica, voting May 24, decided by an overwhelming margin to accept the company's proposal to renew the present wage and working agreement. At a previous poll the proposition was rejected by about 250 votes.

Following rejection bargaining was resumed between the workers' representatives and company officials, which resulted in favor of renewal by more than 500 ballots. The 1925 contract expired May 1. The wage scale is to be renewed for another year.

Union officials had sought an increase of 10 cents an hour.

Rochester employees were especially insistent on the wage boost, mainly because of the fact that the company on Jan. 1 was granted a 1-cent fare increase in that city. Applications for an increase from 7 to 10 cents in Utica and Syracuse are pending before the Public Service Commission.

President Hamilton maintained that the railway's revenues did not permit of any wage increase, pointing out that any additional revenues derived from fare increases were offset by costs of the improvement program.

Offers Amendments to Milner Plan

Agreement With Prof. Riggs and Engineers Gives Control to Community Traction—Ordinance May Be Submitted

A supplementary report furnished to the city of Toledo by Prof. Henry E. Riggs of the University of Michigan outlining points of agreement between himself and engineers representing Henry L. Doherty & Company, New York, provides a basis for amendments to the Milner franchise ordinance which may be submitted to the people of Toledo at the August primaries or at a later special election. The agreement will be drafted into the form of an ordinance by city legal authorities.

The Community Traction Company is given a monopoly of street railway and bus transportation within the city limits. Definite plans are made for the scrapping of some traction lines, reconstruction of others, extension of several lines through feeder buses, the operation of fifteen bus lines eventually, and the complete rehabilitation of the company property.

It is recommended that the board of street railway control be given full authority over transit affairs and that the fares be automatically regulated by retention of the stabilizing fund. It is proposed to retain the present fare basis of 10 cents cash, three tickets for 25 cents and 1-cent transfer charge.

It is estimated that \$2,860,120 would be required for the rehabilitation and new construction program over a five-year period. The engineers apportioned \$1,323,748 for track work and \$1,051,361 for equipment. In this latter item is \$880,000 for 110 new buses to be acquired if possible on a rental basis, thereby requiring a minimum of actual capital outlay. The company would be relieved of all paving charges, and even the city would undertake to bear the cost of foundation work under tracks. The rehabilitation program would be worked out in connection with city repaving.

A concession in the power rate which would yield estimated savings of \$20,000 annually has also been agreed upon by engineers. A correction for the price of coal would also be effected.

The report does not cover any change in capital value of the company, but suggests suspension of the sinking fund charges which have weighed heavily upon the company in the last five years. In its place a depreciation reserve would be set up equal to 4 per cent of the capital value each year, and when the credit balance was equal to 8 per cent of the capital value a return would be made to the usual sinking fund payments or 1½ per cent annually after 20 per cent of the capital has been retired by the sinking fund.

The engineers have estimated that with increase in population, decline in riding habit, added cost of operating the larger system and offsetting economies there would be an increase in net revenues of about \$100,000 a year under the rehabilitated system. In the economies counted on there is \$250,000 to be saved from eliminating bus competition, \$150,000 from the extension of

one-man cars, \$20,000 from decreased power costs and other savings to bring a total of about \$568,000 a year.

The entire report will be laid before the railroad committee of City Council by Mayor Fred J. Mery so that some concrete action may be taken at the next session of the Council.

Local Regulation in Illinois Nullified

Complete control of all utility operations and practices in the state of Illinois will henceforth rest in the hands of the State Commerce Commission, by virtue of a general order issued on May 21, in which official cognizance is taken of two recent decisions of the Illinois Supreme Court nullifying all city and village ordinances relating to the operation of public utilities within corporate limits.

In both decisions the state tribunal ruled the Illinois utility act repealed by implication certain police powers conferred on municipalities by the cities and villages act of the state of Illinois "for the protection, comfort and safety of the public and the regulation of the operation and practices of public utilities in relation thereto."

One of the decisions was a crossing protection case. In the other, the court ruled that the candlepower of street car headlights was purely a matter for the commission to decide and entirely out of the jurisdiction of the city.

Heretofore, the commission has left to the municipalities the regulation of utility operations, such as speed of cars, hours of service, etc., but it appears from the decision of the court that the commission must assume complete control of utility operation whether inside or outside cities or villages.

Federal Court Permanently Restrains Five-Cent Fare Order

A permanent injunction which perpetually restrains the Illinois Commerce Commission and the city of Chicago from enforcing the commission's orders for 5- and 6-cent fares on the Chicago Railways was entered in the Federal District Court at Chicago on May 19.

Making permanent the temporary injunction issued in 1922 enjoining the 5-cent fare and later the 6-cent fares which the commission attempted to introduce, the decree upholds the findings of Master in Chancery C. B. Morrison that these rates are confiscatory and the orders, therefore, unenforceable. The 7-cent fare which was declared the only legal rate will remain effective for the time being.

Thousands of street car passengers who have been holding transfers in the hope of obtaining a rebate were incidentally notified that they might throw them away without incurring any loss.

Had the court sustained the commission's orders, the Chicago Railways would have sought relief from the burden of paving and street cleaning costs and from paying the city 55 per cent of net earnings as prescribed by the present franchise ordinance.

Connecticut Men Accept Two-Cent Increase

The wage troubles of the railway and bus employees of the Connecticut Company, New Haven, Conn., were finally settled for another year by the employees accepting a compromise suggestion offered by the company for an advance of 2 cents an hour in wages. This makes the rate 62 cents an hour for two-man car operators and 67 cents an hour for the operators of one-man cars. The proposal of an increase was accepted by the men on all divisions except the Hartford Division. The increase will become effective June 1. In granting it the company also grants an eight-hour working day within a period of eleven hours.

On May 10 the employees petitioned the company for an increase of 15 cents an hour and the company in turn replied to the demands of the workers and offered an increase of 2 cents an hour. The matter was taken up by the union and it was decided to submit the offer of the company to the workers themselves to settle it by vote.

Contracts for Toledo Interurban Not Yet Renewed

Contracts under which the interurban lines use the tracks of the Community Traction Company, Toledo, Ohio, expired on May 1 and as yet no conferences have been held regarding renewal of the agreements. Commissioner E. L. Graumlich has called attention of company officials to the necessity of increasing the rentals to reimburse the company for delays and heavy maintenance costs in the downtown district.

During the last few weeks a new traffic control system has been studied for use in the downtown district to facilitate the movement of both street cars and automobiles. The new leasing contract may be held up pending the solution of this problem. Moreover, there is a possibility that a shorter loop for the interurban lines will be arranged. At the instance of the Toledo Automobile Club the city officials are making a survey to determine what effect stopping of interurbans at the city limits would have on elimination of congestion of traffic on downtown streets.

Franchise Talk Renewed in St. Louis

Except for the settlement of two points at issue city officials of St. Louis, Mo., and officers of the St. Louis Public Service Company, St. Louis, Mo., are agreed on the terms of the service-at-cost franchise under which the new company will operate when it takes over the property of the United Railways after foreclosure.

The chief point at issue is the mill tax levied against fares. The United Railways is in arrears \$3,000,000 on this tax. It has not been decided how this sum shall be paid off and whether the city shall continue to collect the tax. The reorganization committee has admitted the outstanding obligation to the city, but desires to pay off the debt over a period of years.

The new company would eliminate the tax as a burden on car riders—

the class least able to pay any taxes—but the city pleads necessity, pointing out that it has reached the constitutional limit on direct taxes, \$1.35 on each \$100 valuation. It needs the \$600,000 raised annually through the mill tax and prefers to let the car riders pay rather than impose other indirect taxes on the citizens.

If the city insists that the tax continue in effect company officials have suggested that it be paid only if a sum sufficient to do so remains in the treasury after the company has paid off every other obligation and paid itself a return on a fair valuation.

The other point at issue is whether a clause in the new ordinance shall provide that should any part of the new franchise ordinance be declared illegal other clauses shall not be affected, and the franchise shall continue in full force and effect.

Ten Cents in Salt Lake City

An increase in cash fares to 10 cents, with three tokens for 25 cents, was allowed the Utah Light & Traction Company, Salt Lake City, Utah, in a decision of the Public Utilities Commission rendered on May 19. In the same decision the commission denied the application of the company for permission to increase student commutation tickets from 50 for \$2 to 40 for \$2. The ruling also made permanent the weekly pass of the company. Heretofore the use of the pass has been only a temporary arrangement. The commission ruled that the price of that pass should remain as now, \$1.25 for one zone, \$1.75 for two zones and \$2.25 for three zones. Another part of the order stated that the railway was to sell books of thirteen commutation tickets for \$1. The new tariff became effective on May 23.

In its application to the commission for permission to raise its rates the company asked for a 10-cent cash fare, three tokens for 25 cents, the increase on student tickets as stated, the elimination of books of commutation tickets and the keeping of the weekly pass at present prices.

The commission in arriving at its decision declared that it was a well-established principle that fares should be commensurate with the cost of operating a public utility, and paying a fair return to those who had risked their money to provide facilities for rendering public utility service. The commission held that car fares bear a direct relation to efficient service, "and efficient service, in the last analysis, means all the comfort and convenience to a car rider that is generally desired." The commission in its conclusion stated that "under present conditions and circumstances the new rates should prove sufficient to enable the applicant to provide adequate and efficient street car service."

The hearing before the commission on the application lasted a week or more, and the case was then held open until April 30, on which date final arguments were heard. The commission ordered the suspension of the proposed rates until May 20, or such time as it should require to decide the case. Most of the objections were against the maximum fare and not against the idea of an increase.

Negotiations for New Franchise in Kansas City Proposed

Five points will dominate the negotiations for a new franchise for the Kansas City Public Service Company, the successor under foreclosure to the property of the Kansas City Railways. They are:

- Term of franchise.
- Service at cost.
- Inclusion of bus franchise in rail grant.
- Paving and street cleaning.
- Extensions.

It has been made plain that the company would not insist upon the proposed service-at-cost plan, but would present the plan in an effort to convince the city it was the modern and most satisfactory way of fixing fares.

Elimination of the clauses in the present franchise requiring the company to pave between the tracks and 18 in. on each side of the tracks, and to pay for street cleaning on the rights of way will be asked by the company.

A new 30-year franchise, instead of an amendment to the present franchise, is desirable, because it would aid in refinancing the company.

Inclusion of the bus franchise will be asked as a means of stabilizing the company and to aid in establishing the company on a sound basis.

Present Wage Scale in Davenport Continued

The Tri-City Railway, Davenport, Iowa; Moline and Rock Island, Ill., has signed contracts with its operators, continuing the present scale until June 1, 1927, and indefinitely thereafter until either party opens negotiations by giving 30 days notice. The scale graduates from 54½ cents an hour for three months men, 56½ cents for six months men and 58½ cents thereafter.

A few minor concessions were made in working terms.

Car Line at Fort Dodge to Be Restored

Residents of Fort Dodge, Iowa, have organized the Street Railway Operating Company and are making plans to operate the one local car line in the city with equipment leased from the Fort Dodge, Des Moines & Southern Railroad. The new company has filed articles of incorporation with the Recorder of Webster County. It expects to be operating cars in the city within 30 days.

Officers of the company are: Henry Schultz, president; Jay Pooler, vice-president; Harry Davidson, secretary, and Mrs. Fred Dahleen, treasurer. Directors are: William Hay, Fred Carlson, Andrew Braso, George Leslie, A. E. Newsum and the officers.

Five hundred shares of stock at a par value of \$10 will be sold to residents in the districts served by the line. Backers of the move predicted that the stock would find a ready sale.

The car line connects the business section of Fort Dodge with the two railroad stations and runs out to Gypsum City. It is about 4 miles long. Service was discontinued on Nov. 14, 1925, by the Fort Dodge, Des Moines & Southern Railroad on the ground that the line was losing money.

Paul Renshaw Gets Utility Prize

Paul Renshaw, advertising manager of the Memphis Power & Light Company and the Memphis Street Railway, Memphis, Tenn., was winner of the national prize awarded for the best contribution on the subject of public relations in the electric light industry at the Atlantic City meeting.

The prize is a cash award of \$250, donated by Martin J. Insull, president of the Middle West Utilities Company.

Mr. Renshaw's paper discussed the subject from the threefold phase of "why public relations are conducted," "how they may be successfully promoted," and "results that may reasonably be expected."

Each contestant in the competition was allowed the latitude of personal judgment in the manner of treatment, and the committee's award was made on the basis of which article they considered best in its treatment of the entire subject.

Scranton Routes Being Studied

Traffic engineers employed by the Fitkin interests of New York, which control the Scranton Railway, Scranton, Pa., and who are now engaged in a study of Mayor E. B. Jermyn's proposal to reroute trolley cars in the central city, are expected to complete their report soon. The report is to include a cost estimate. The Mayor's scheme calls for the elimination of service by electric railway on Washington and Wyoming Avenues and Linden and Spruce Streets. The tracks will not be removed, however, until the new trolley routing system has been thoroughly tried out.

News Notes

Guess Traffic—Prize a Pass.—The Tacoma Railway & Power Company, Tacoma, Wash., is offering weekly passes as prizes to those who make accurate guesses of its weekly traffic. Only one guess is allowed to each person. A recent first prize was won by Mrs. Herman Schroeder. Her guess was 447,000 and the actual number of rides was 447,263.

Seeks Eight Cents in Hannibal.—An increase in railway fares from 6 cents to 8 cents is sought by the Hannibal Railway & Electric Company, Hannibal, Mo. In an application filed on May 15 with the Public Service Commission the company declared that competition of "unregulated and unrestricted" bus lines had resulted in heavy financial loss to the company and threatened suspension of service. The Hannibal company charged a 5-cent fare until Feb. 1, 1924, when the fare was increased to 6 cents by the Public Service Commission.

"Personal Touch" Successful in Evansville.—Gus Muhlhause, vice-president of the Evansville Suburban & Newburgh Railway, Evansville, Ind., has found that the "personal touch" pays in the traction business. His interest in community development has resulted in traffic increases. He assists the Boonville Business Men's Associa-

tion in staging an auction and bargain day in Boonville twice a month and on these days the Boonville traction lines haul a large number of passengers into the town. Two of these auction and bargain days have already been held and they have proved very successful.

Rates in Kansas City Extended.—The Public Service Commission on May 15 issued an order extending the present rates of the Kansas City Railways, Kansas City, Mo., for six months from May 18.

Temporary Increase Allowed.—The State Public Service Commission has granted the Wheeling Public Service Company, Wheeling, W. Va., a temporary increase in rates between Wheeling and the "S" bridge at Elm Grove. The increase becomes effective on June 1. The new fare schedule authorizes a new zone, which will make the fare between Wheeling and Elm Grove 15 cents. The new zone extends from Wheeling proper to Glenwood, with a cash fare of 8 cents or ticket fare at 6 cents. The third zone will extend from Wheeling Park to the "S" bridge.

Would Extend Freight Service.—The Oklahoma Railway, Oklahoma City, Okla., is planning to extend its freight service to Piedmont. The proposal includes the building of a track between Piedmont and the El Reno line. It is estimated that the work will require about \$90,000. It is because Piedmont is now without a rail connection with Oklahoma City that its citizens are desirous of obtaining the fast freight service. They have already obtained the approval of the Oklahoma City Chamber of Commerce.

Increased Fare Sought.—The Philadelphia Railways, connecting Philadelphia, Eddystone and Chester and operating under agreement the Essington Division of the Chester & Philadelphia Railway, has applied to the Public Service Commission for a new tariff which provides for a substantial increase in existing rates of fare. The present rate between Third and Jackson Streets, Philadelphia, and Hog Island Junction, at the west side of the Penrose Ferry Bridge, is 7 cents. Under the new schedule it will be 10 cents. Similarly the rate from Hog Island Junction to Bow Creek will be increased from 7 cents to 10 cents. The Philadelphia Railways was incorporated under the laws of Pennsylvania in 1911, as successor to the Southwestern Street Railway, the property of which was sold under foreclosure on April 21, 1911. The property was taken over on Dec. 10, 1918, by the Emergency Fleet Corporation, but on June 1, 1922, was returned to the company.

Prefer Fifteen-Minute Schedule.—The trolley line between Worcester and Leicester, Mass., is operating on a fifteen-minute schedule following a poll which was taken to determine the sentiment of the Leicester and Cherry Valley commuters. The poll resulted in 141 votes in favor of the fifteen-minute schedule, while three voted for the old hour schedule. Twelve riders signified they were indifferent. The voters were called upon to state their preference of "one through car" once an hour or the fifteen-minute schedule. A tabulator

was assigned to ride each through car and determine the sentiment.

Summer Excursions Planned.—The Indiana Service Corporation, Fort Wayne, Ind., will again run excursions this summer to Niagara Falls, N. Y., and Toronto, Canada. This plan was announced by J. A. Greenland, general passenger and freight agent. These excursions are run over electric lines to Toledo, Ohio, and the rest of the trip is made by boat.

Refuses Franchise Renewal.—The East St. Louis, Ill., City Council by a vote of three to two recently refused to renew the Third Street franchise of the East St. Louis Railway. A week prior to the vote the Council ordered the company to take up its tracks on Third Street between Broadway and Missouri Avenue. The company claimed that the tracks on Third Street were necessary for the maintenance of good street car service in the city. The railway has appealed to the Illinois Commerce Commission.

Will Extend Line if Workers Desire It.—Questionnaires are being circulated among employees of the larger River Road industries at Buffalo, N. Y., by the International Railway to determine the advisability of extending the company's traction service on this line. The plan was evolved by B. J. Yungbluth, president of the International Railway, as a guide to the schedule department of the company. About 15,000 workers are employed in the large River Road industries north of the Buffalo city line. Increased night work in these mills makes an extension of the night service on the River Road traction line a necessity, but the company is anxious to determine how many workers would avail themselves of the company's facilities and how many use motor cars to and from work. Already the company has improved its service on the line and additional service also is planned.

Arbitration to Decide Wages in Peoria.—Representatives of the trainmen, carhouse men and shop employees of the Illinois Power & Light Corporation stationed at Peoria, Ill., have agreed with representatives of the company on wage arbitration. Henry Mansfield will represent the employees and E. E. Soules the traction company. Both served on a similar board last year. The trainmen have asked a 10-cent increase over the present wage of 55 cents, which is also paid to the bus operators. Shopmen are on a sliding scale.

Commission Orders Traffic Control.—Full traffic control on the Oregon Electric Line and the River Road at Island Station will be established, according to an order issued by the State Public Service Commission. Trains may pass this intersection at a speed of only 10 miles and motor traffic must come to a complete stop. The Portland Electric Power Company must also construct at its own expense stop signals on each side of the track at this point, and shall also erect on each side of the approaches of this crossing at a distance of 50 ft. therefrom stop posts of the usual standard with black and yellow stripes, equipped with red lights or similar reflective devices that offer a warning at night.

Recent Bus Developments

Interstate Suit Over Until Fall

So far as the United States Supreme Court is concerned that angle of the litigation between the Interstate Buses Corporation and the Holyoke Street Railway, Holyoke, Mass., already appealed to it will remain in *status quo* over the summer holidays. The court on May 24 denied the motion of the Buses Corporation for an immediate restraining order, but granted its motion to advance hearing of the case on its merits and fixed the date as Oct. 4.

The Interstate Buses Corporation, a Connecticut corporation, operates, among others, a line of passenger buses between Hartford, Conn., and Greenfield, Mass. For a portion of this route its vehicles parallel the tracks of the Holyoke Street Railway. That company, charging unfair competition, sued the bus company in a Massachusetts state court. Among other things it alleged illegal operation in that the bus corporation had not complied with the Massachusetts law of 1925 requiring that where intrastate business is done by a bus company it shall secure license and permit, failure to do so being termed a nuisance. The bus corporation had this suit removed to the United States District Court. The president of the street railway company thereupon secured warrants against various drivers and other employees of the bus company and a number of them were fined in court.

The federal district court granted an injunction to the railway company until the bus company complied with the state law and dismissed a cross-bill filed by the bus corporation seeking an injunction against arrest of its employees. From dismissal of its cross-suit the bus company appealed direct to the Supreme Court, and it was on this that the rulings on the motions were made on May 24. The bus company has appealed to the U. S. Circuit Court of Appeals from the injunction against it, being unable to carry this case to the Supreme Court direct from the district court.

I. C. C. to Inquire Into Bus Competition Pending Legislation

An investigation of bus and motor truck operation by the railroads of the country and of bus and truck competition with the railroads was ordered by the Interstate Commerce Commission on May 25.

In ordering the investigation the commission said it appeared that the operation of buses and trucks by or in competition with the common carriers of the country was increasing and likely to increase further. Therefore it was concluded the commission should take cognizance of this form of transportation and its effect on the railroads in traffic handled and in revenues or rates.

Issuance of the order follows closely on the determination of the Senate interstate commerce committee to table for the present session the bill putting

motor trucks and buses engaged in interstate traffic under the jurisdiction of the commission.

The idea of the commission is to make an independent investigation of the facts for use as a background in the adjudication of the pending cases in which motor transportation is a factor. Public hearings will be held in Washington and other cities.

Steam Railroad's Plea Denied

Buses run in the interest of the Boston & Maine Railroad will not be permitted to compete with the railway lines of the Cumberland County Power & Light Company, Portland. The Public Utilities Commission would not grant the Boston & Maine Transportation Company a permit to run the buses. At the hearing the railroad disclaimed any wish to compete with the trolley lines. It explained that it desired to eliminate train stops at several of its stations on the route to Old Orchard. The commission felt that no restrictions that might be imposed would prevent some competition and that the replacement of train service would be disastrous to the communities served. This is another instance of a ruling adverse to an applicant seeking to establish bus service in Maine that might prove to be competitive.

Sightseeing Subterfuge Squelched

Justice Young of the Court of Special Term, State of New York, granted a permanent injunction on May 26 against the Mount Vernon Sightseeing Bus Company and Harry Pollowitz on application of the Westchester Electric Railroad, a subsidiary of the Third Avenue Railway system, New York, and of the New York Central Railroad, co-plaintiff. The defendants had obtained a permit from the city of Mount Vernon, but had failed to apply for a state certificate of necessity and convenience on the allegation that they were operating a sightseeing service. General Superintendent Thompson and Assistant General Superintendent Wheeler testified as to the traffic carried by trolley cars to the subway terminus near the Mount Vernon-New York City line, while Walter Jackson, consulting engineer, testified for the Westchester Electric Railroad that the bus service took trade from both the railroads and the trolley company. Justice Young's decision confirms the temporary injunction granted in April by Justice Taylor.

Eureka to Vote on Bus

A bond election will be held in Eureka, Cal., on June 14 to vote approval of a \$100,000 bond issue to place eight buses on the streets instead of the electric railway cars. If it carries, street car tracks will be torn up. If it fails, then a proposition will be put up to the people to vote for a \$270,000 bond issue to rehabilitate the Eureka Street Railway.

Railway and Bus Company Compromise

Approval was given by the Public Utilities Commission to a municipal permit allowing Arthur J. Seldney to operate a bus between Morristown and Morris Plains. The route, about 5 miles long, parallels the tracks of the Morris County Traction Company in Park Place and Morris Street, Morristown. The fare will be 7 cents one way. School children will be carried at 7 cents for two rides. Mr. Seldney agreed to discontinue his bus line between Morristown and Rockaway in competition with the Morris County Traction Company.

Mr. Seldney and officers of the railway will meet with the board's traffic inspector and go over the proposed new route to make restrictions preventing competition. It was agreed by Mr. Seldney not to pick up or discharge passengers in Hanover Avenue within 300 ft. of Speedwell Avenue, and that conspicuous signs be placed indicating the bus stops.

As receivers for the Morris County Traction Company, Joseph P. Tumulty and Joseph K. Choate were granted permission by the board to suspend railway service between Springfield Center and the Central Railroad station in Elizabeth, and to substitute two emergency buses.

Compromise in Manitowoc

Compromising with the Wisconsin Public Service Corporation on a new and revised bus fare schedule of three tickets for 25 cents, seven for 50 cents and a 10-cent cash fare, the City Council of Manitowoc, Wis., by a vote of twelve to two accepted the corporation's proposal to discontinue the present unprofitable railway service in favor of bus service. This change in city transportation facilities will be provided in the form of a four months experiment and will commence about June 1.

Should the riding public express dissatisfaction with the bus service, the traction company has promised to return to the use of street cars. In view of the city's consent the proposal will now go to the Railroad Commission for its approval or rejection. The various steps in the proposed change have been referred to in the *ELECTRIC RAILWAY JOURNAL* from time to time.

New Line Planned.—The Lehigh Valley Transit Company, Allentown, Pa., has applied to the Public Service Commission for permission to discontinue service between Lansdale and Chestnut Hill. At the same time its subsidiary, the Lehigh Valley Transportation Company, has applied to substitute a bus service on the same route. H. F. Dicke, vice-president of both companies, said that for some years the Lehigh Valley Transit Company has been operating the Chestnut Hill service at a loss. He said that improvements were being made by the Commissioners of Montgomery County which, in the event of the railway service not being abandoned, would involve the company in an immediate expenditure of \$37,000 and an additional sum in the next ten years of \$238,400.

Bus to Replace Railway in Hornell.—The Hornell Traction Company, Hornell, N. Y., after 33 years of operation, has announced that it will suspend its city and Hornell-Canisteo lines Aug. 1. An application for a bus line to replace the railway service has been submitted to the Council by Raymond E. Page, receiver for the traction company. It owns and operates about 15 miles of local lines in addition to the 5-mile interurban route between Hornell and Canisteo. The present carhouse will be used as a garage and repair shop for the buses. Local trolley fares, now fixed at 8 cents, would be raised to 10 cents on the buses and the 16-cent fare from Hornell to Canisteo would be raised to 20 cents. It is proposed, however, to sell three bus tickets for 25 cents.

Bus Service in Keene Being Planned.—The Keene Electric Railway, Keene, N. H., is planning to establish bus service in various sections of Keene. The company, operating 10 miles of line, was recently granted authority by the Public Service Commission to use buses on city lines.

Will Operate in Mississippi Towns.—The City Bus Company has been organized as a subsidiary of the Mississippi Power Company for the purpose of taking over and operating the bus line now in service between Pass Christian, Biloxi, Gulfport and other Harrison County coast points. Application has been filed with the Mississippi Railroad Commission for a certificate of authority to begin operations. This is required by an act passed at the last session of the Legislature placing all bus lines under the supervision of the Railroad Commission. The City Bus Company, it is understood, will extend its service to Bay St. Louis, Ocean Springs and several other points as soon as bridges are completed across the Bay of St. Louis and Biloxi Bay.

Beautiful Trips Planned.—The International Railway, Buffalo, in co-operation with the Philadelphia Rapid Transit Company, and Mitten Management, Inc., of Philadelphia plans to start de luxe bus service between Buffalo and Philadelphia this summer. Two days will be required to make the trip over the scenic highways between Buffalo and Philadelphia. Only through passengers will be carried because no local franchises have been obtained from the cities and towns through which the buses will operate. Interstate bus service does not require local franchises.

Railway Buys Bus Franchise.—A franchise for operating bus routes on the west side, south of Main Street, Binghamton, N. Y., was sold on May 10 to the Binghamton Railway after three adjournments. The price was \$450. Franchise for the route must also be obtained from the State Public Service Commission. The maximum fare allowed by the city is 7 cents.

Independent Passes to Traction Interests.—The Indiana Public Service Commission recently approved the sale by the Mid-West Transit Company of its permit to operate a line between Indianapolis and West Lafayette to the Indiana Motor Transit Company, a subsidiary of the Terre Haute, Indianapolis & Eastern Traction Company. This

line passes through Lafayette, Lebanon, Stanton, Royalton, Traders Point and Flackville. The Motor Transit Company already owns the original Hiner line between these two terminals and plans to abandon operations under one of the certificates. The commission authorized Charles Allen & Sons to discontinue operation of a bus route between Monon and Lafayette on the ground that the line is not a paying proposition.

Bloomington Gets Buses.—Six new Mack buses were placed in service on a new cross-town line in Bloomington, Ill., recently by the Illinois Power & Light Corporation. The buses are being operated on a 7½-minute headway. They will serve a section of the city heretofore not conveniently accessible to street car lines. Railway service on one route which is paralleled by the bus line will be discontinued. The same fare prevails on both street cars and buses. Transfers are being issued at regular transfer points.

New Bus Route Authorized.—The City Council of Lackawanna, N. Y., has granted a franchise to the Hamburg Railway, Hamburg, N. Y., to operate buses from the Buffalo city line at Abbott Road through Lackawanna and Bladell to Woodlawn Beach, a lake shore summer resort. The fare will be 10 cents for adults and half fare for children under twelve years of age. Buses will be operated on a 40-minute schedule. Single-deck buses will be purchased for this new route.

Bus Permits Rescinded.—The Common Council of Syracuse, N. Y., has rescinded permits granted to a number of bus line operators prior to Jan. 1, 1925. This is the result of long litigation. The permits invalidated include that of T. C. Cherry and the Mid-State Coach Corporation. This company, a subsidiary of the Empire State Railroad, has filed a petition with the Public Service Commission for permission to establish a line to Oswego.

Bus Line Extended.—The Berkshire Street Railway was recently granted a license by the city of Pittsfield, Mass., to operate a bus line through that city to the Lennox boundary. The granting of this license was the last link needed to provide the bus service planned by the street railway from Pittsfield to Great Barrington. The towns south of Pittsfield granted the company the necessary licenses some time ago.

Bus Operation Looks Hopeful.—Bus operation on the Syracuse & Eastern Bus Lines, Inc., a subsidiary of the Syracuse & Eastern Railroad, Syracuse, N. Y., is beginning to show an increase, and company officials are predicting that the company may break even this year, compared with the deficit of \$1,511 for 1925. The net income for the first three months of 1926 on the bus lines was \$892. Cash fares were 139,675, an increase of 63,091 compared with the first three months of 1925.

Another Extension of Bus Permits.—The Massachusetts State Commission of Public Utilities has announced that the temporary permits granted for the operation of buses will be extended to June 30. These permits were originally expected to terminate on Dec. 31, 1925, and were extended to May 31.

Buses in Danville.—Buses will be introduced in Danville, Ill., soon by the Illinois Traction, Inc. Michael Connor, superintendent, announced that a fifteen-minute service will be established over the first route and other lines which would be established as quickly as possible. Authority to use buses was recently granted by the Illinois Commerce Commission.

Council Disapproves Voters' Views on Lines.—The Buffalo, N. Y., City Council failed to approve a proposed referendum which would allow registered voters to express their views on franchises authorizing the International Railway to start two new bus lines and scrap several existing car lines in the city. Petitions for a referendum now have more than 15,000 signatures. Under the city charter a referendum is allowed on all franchises if a sufficient number of voters demand the right to express their views on the grants at the polls. In view of the attitude of the City Council, it was agreed to hold up the bus permits until the return to Buffalo next month of Mayor Frank X. Schwab, who is touring Europe. It is doubtful if the bus service will be started this year because no referendum could be held until November unless the expense of a special election is decided upon.

Will Serve Western Section.—The Rochester Co-ordinated Bus Lines, Inc., subsidiary of the New York State Railways, will start bus service on a new line on the west side, to be known as the Glide Street route, following a grant by the Council. The new line will serve as a feeder to the Emerson Street car line, in accordance with the general policy of the New York State Railways to co-ordinate bus and railway service. The new route will serve a populous residential and factory district on the extreme western limits of the city.

Radial Service Discontinued.—The Canadian National Electric Railways has withdrawn its Weston-Woodbridge radial service on the Western Road, Toronto. Five buses, each seating from 20 to 22 passengers, are now handling the traffic. Although only one car was operated, the radial service ran at a loss all through the winter, it was learned, and the authorities apparently determined that a continuance of the service during the summer meant even heavier losses. The radial fare from Weston to Woodbridge was 16 cents, compared to 25 cents on the buses.

Bus Service in Jacksonville, Ill.—The Illinois Power & Light Corporation suspended railway service between the city square and Nichols Park in the city of Jacksonville, Ill., when it placed in operation on May 7 two new Graham Brothers buses with a capacity of 21 passengers each. For the time being, bus passengers will be carried at the prevailing car fare of 7 cents, although the company states it will probably be compelled to ask a 10-cent fare.

Opposes Bus System.—The Knoxville Power & Light Company of Knoxville, Tenn., has indicated that it will oppose the franchise bid sought by a bus transportation system for operation over certain streets in the city of Knoxville. The railway has stated that its "investment in Knoxville would be impaired by the proposed competition."

Financial and Corporate

Judge Stone to Confirm Sale of Kansas City Railways

Judge Kimbrough Stone has decided to overrule objections to the foreclosure sale of the property of the Kansas City Railways, Kansas City, Mo., voiced by the second mortgage bondholders and the stockholders of the railway.

Judge Stone's intention to enter an order confirming the sale of the railway to Powell C. Groner has been communicated to R. J. Higgins, who, as attorney for the trustees under the first mortgage, had filed a motion asking for the confirmation.

Powell C. Groner, whose nominal bid of \$8,000,000 is to be confirmed, made that bid for the first mortgage bondholders.

The reorganization committee, with Newman, Saunders & Company as reorganization managers, have a corporate vehicle ready in the Kansas City Public Service Company, with William G. Woodfolk as president. In the interval of the transfer the property will remain in charge of Francis M. Wilson and Fred W. Fleming, receivers.

It is said that the fact that Blatchford Downing, attorney for the second mortgage bondholders, has indicated he will carry the case to the court of appeals probably will not interfere with the physical transfer of the property and the termination of the receivership.

Mr. Downing and also Frank P. Sebree, attorney for stockholders, have objected to confirmation of the sale mainly on two grounds, the basis of settlement with the damage suit creditors and the alleged insufficiency of Mr. Groner's bid.

New York Central Advances Money to Traction Lines

In the report of the board of directors to the stockholders of the New York Central Railroad, New York, N. Y., for the year ended Dec. 31, 1925, the company states that there was advanced to the New York & Harlem Railroad in connection with the operation of its traction lines in New York City the sum of \$205,000, making the total advances for this purpose to Dec. 31, 1925, \$1,312,000. There was advanced to the New York State Railways on its demand notes \$1,475,000 and to the Schenectady Railway, also on demand notes, \$233,150.

Terms of Distribution of Ohio Traction Assets Decided

Directors of the Ohio Traction Company, Cincinnati, Ohio, have accepted the offer of committees representing preferred and common stockholders to purchase outright the assets of the Ohio Traction Company, Cincinnati Traction Company and Cincinnati Car Company for \$5,950,000. This offer is to be submitted to the stockholders at a meeting on June 22. The proposed

plan includes organization of a new corporation whose stock will be distributed to Ohio Traction stockholders at a rate of 2½ shares of new stock for each share of preferred deposited, and one share of new stock for three shares of old common deposited. The matter was referred to at length in the ELECTRIC RAILWAY JOURNAL for May 8, page 822.

Automobiles Continue to Affect Income of Washington Company

For the year ended Dec. 31, 1925, the net income of the Capital Traction Company, Washington, D. C., was about \$50,000 less than the amount required for the 7 per cent dividend. Operating expenses increased slightly, due entirely to the great increase in the bus service furnished, rail operations costing less than in 1924. Increased competition of privately owned automobiles and of buses continued to cause a decrease in street car traffic, with a corresponding falling off in revenue. The report of George E. Hamilton, then president of the company, to the stockholders, says that it is encouraging to note that the loss in passengers carried for the year 1925 compared with the preceding year was less than 2 per cent, a smaller loss than that of any year since 1919, and also that the last few months of the

SUMMARY OF OPERATIONS OF THE CAPITAL TRACTION COMPANY FOR YEAR ENDED DEC. 31

	1925	1924
Passenger revenue, railway..	\$4,482,040	\$4,542,767
Bus revenue.....	81,877	50,383
Special car revenue.....	60	131
Special bus revenue.....	95
Total revenue from transportation.....	\$4,564,073	\$4,593,282
Revenue from operations other than transportation	22,982	21,055
Railway operating revenue..	\$4,587,055	\$4,614,337
Operating expenses (67.31 per cent of gross revenue)	3,110,085	3,073,810
Net operating revenue....	\$1,476,969	\$1,540,527
Taxes assignable to railway operation.....	386,243	392,821
Operating income.....	\$1,090,725	\$1,148,104
Non-operating income.....	33,132	32,421
Gross income.....	\$1,123,858	\$1,180,495
Deductions from gross income:		
Interest on funded debt.....	\$280,300	
Interest on unfunded debt..	39,056	
Rent for leased road	11,721	
Income tax paid at source.....	4,314	
Total deductions.....	\$335,392	\$324,713
Net income.....	\$788,465	\$855,782
Profit and loss statement:		
Credits:		
Balance at beginning of year..	\$1,528,483	
Net income for year.....	788,465	
Refunds, electric light bills prior years.....	1,296	
	\$2,318,246	
Debits:		
Dividends.....	840,000	
Credit balance at close of year.....	\$1,478,246	\$1,528,483

REVENUE AND TRANSFER PASSENGERS CARRIED BY THE CAPITAL TRACTION COMPANY

	1925	1924
Railway passengers:		
Number of passengers carried at 8 cents.....	16,995,347	16,427,541
Number of passengers carried at 6½ cents.....	45,066,128	46,846,110
Number of passengers carried at 5 cents.....	833,352	791,476
Number of passengers carried at 3 cents.....	345,131	338,017
Number of cash passengers carried on Kennington line	119,757	119,317
Number of ticket passengers carried on Kennington line	52,547	58,092
Total railway revenue passengers.....	63,412,262	64,580,553
Bus passengers:		
Number of passengers carried at 25 cents.....	71,466
Number of passengers carried at 10 cents.....	1,160
Number of passengers carried at 8 cents.....	252,588	196,068
Number of passengers carried at 6½ cents.....	466,617	374,078
Number of passengers carried at 5 cents.....	640
Total bus revenue passengers.....	792,471	570,146
Total revenue passengers, railway and bus.....	64,204,733	65,150,699
Other passengers:		
1-cent intercompany transfer passengers.....	2,759,208	2,794,895
2-cent bus to car transfer passengers.....	344,011	275,692
2-cent car to bus transfer passengers.....	310,712	240,160
2-cent Eastern High School ticket passengers.....	4	1,378
Free transfer passengers.....	17,111,342	17,105,848
Other free passengers:		
Employees.....	727,894	792,131
Policemen and firemen*.....	56,714	64,190
Total passengers.....	85,514,618	86,424,993

* Exclusive of policemen and firemen riding free while in uniform.

year showed an actual gain in passengers carried.

Two additional bus lines were established and one purchased during 1925. Capital expenditures for the year amounted to \$228,575, the larger part of which consisted of betterments in connection with renewal of track and the purchase of additional buses. Six parlor car coaches were purchased to be used on the Chevy Chase Coach Line and two smaller street car type vehicles for the feeder line near Chevy Chase Circle. No additional street cars were purchased.

Depreciation reserve increased from \$2,075,155 to \$2,458,455.

The report referred to the suggestion of the North American Company looking toward a merger of the street railway companies. Mr. Hamilton states that a satisfactory base of consolidation or merger has not yet been determined, but an earnest effort is being made by the parties to these negotiations to work out a plan of merger useful and protective to the security holders and to the public.

New Owners Take Over Laconia Property

The Laconia Street Railway, Laconia, N. H., was acquired recently by Guy M. Tetley and Howard W. Byse, Laconia. The sale was made from the receivership of Judge Frank M. Beckford. The reorganization of the company's affairs is already under way. New officers have been elected as follows: President, Guy M. Tetley; vice-president, Howard W. Byse; secretary, Thomas F. Cheney.

Plans include the purchase of new equipment and a rearrangement of the schedules. The Laconia Street Railway is 8 miles long. It was organized in the early '80s, when horse cars were the vogue. Subsequently, the road was electrified, but a year ago the trolleys were succeeded by buses.

Alton Property Sale Set for June 16

Louis Clements, Danville, Ill., attorney, has been appointed a special master in chancery by the U. S. District Court in East St. Louis with authority to sell the properties of the Alton, Granite & St. Louis Traction Company, the Alton Gas & Electric Company, controlled by the East St. Louis & Suburban Company. The Illinois State Trust Company, trustee, is plaintiff in the action in federal court to foreclose on the \$2,500,000 mortgage on the properties. The last-named corporation is a Delaware concern, the two others are under Illinois charter. The sale of the properties is ordered for June 16 at Edwardsville, Ill.

California Road Reports \$94,727 Available for Surplus

Central California Traction Company, operating in Sacramento, Stockton and Lodi, reports to the California Railroad Commission its 1925 operating revenue at \$592,036, compared with \$592,798 for 1924.

The operating expenses, excluding taxes, for 1925 are reported at \$483,069 and at \$507,744 for 1924, leaving net operating revenue of \$108,966 for 1925 and \$85,053 for 1924. During

1925 taxes charged to operation amounted to \$31,195 and for 1924 to \$31,911. Deducting the taxes leaves operating income of \$77,771 for 1925 and \$53,142 for 1924. Adding to the operating income the non-operating income of the company results in a gross corporate income, which represents the amount available for interest, amortization of debt discount, other fixed charges, non-operating expenses, dividends and surplus, of \$94,727 for 1925 and \$73,969 for 1924.

Claims Against United Railways, St. Louis, for Services Disallowed

Special Master Fred L. Williams in reports filed with the United States District Court recommended that claims of A. L. Shapleigh, Richard McCulloch and Judge Henry S. Priest, totaling \$125,175, against the United Railways, St. Louis, Mo., for services alleged to have been rendered be denied.

Messrs. Shapleigh and McCulloch had asked \$30,937 and \$24,487 respectively for acting as president of the United Railways since the receivership, while Judge Priest asked \$69,750 salary as general counsel for the company.

Their claims were not resisted by Receiver Wells at the recent hearing before Special Master Williams. In his report denying the claims and recommending that this action be approved by the court Mr. Williams held that the proof offered at the hearing in support of the claims was not sufficiently definite for him to determine the reasonable value of the services which it was set up had been rendered.

\$313,006 to Philadelphia Surplus

P. R. T. Took in \$49,911,703 in 1925—Lost \$228,989 on Buses—Many Interesting Facts in Statement

Passenger revenue of the Philadelphia Rapid Transit Company, Philadelphia, Pa., for 1925, including buses, was \$49,911,703. Operating expenses and taxes were \$37,533,858. After providing for payments to city sinking fund, rental for Frankford elevated, fixed charges, the semi-annual dividend on preferred stock and 8 per cent dividends on common stock, \$313,006 remained to be transferred to surplus.

Net income for 1925 of \$3,006,727 is from the operation of subway-elevated and surface lines. From this must be deducted the loss of \$233,211 resulting from the operation of buses and trackless trolley, making a net income for the entire system of \$2,773,516.

During the fifteen years 1911-1925 under Mitten Management P. R. T. earned a surplus of \$19,866,381. Of this \$13,687,464 has been paid in P. R. T. dividends and \$6,178,916 put back into the property.

P. R. T. bus system has, during 1925, been extended through the installation of nine new routes operating over 150 miles of city streets. A deficit of 228,989 resulted from 1925 operation through giving service in districts where it is needed, but which will be unprofitable for years to come. As the management sees it, this deficit does not take into consideration the much larger loss due to duplication of service through diversion of traffic from surface cars. Supplying this needed but unprofitable service by street cars would have resulted in a much greater loss.

Throughout the year 1925 P. R. T. has been engaged in the presentation of facts and legal argument before the Public Service Commission demonstrating its right to continue the temporary 7½-cent token-8-cent cash fare. The Public Service Commission, in its decision handed down on Jan. 12, 1926, gave this rate of fare final approval. The P. R. T. present 7½-cent fare embodies a combined surface-elevated-subway ride.

P. R. T. has continued to work toward a transit system which contemplates co-ordinating and unifying every phase of Philadelphia's public passenger transportation. To this end the operation of street car lines, city-built high-speed lines and buses has been consolidated. As a necessary step toward further co-ordination, P. R. T. proposes to operate taxicabs and to this end has arranged, subject to the approval of the Public Service Commission, for the purchase of the Yellow Taxicab Company for \$3,000,000.

Following the stockholders' approval at the 1925 annual meeting, P. R. T. presented to the city the easterly half of the P. R. T.-owned tract of ground known as Burd Home so that it might be used as an extension of Cobbs Creek Park. The cost of this acreage is continued as part of P. R. T. valuation, but the city secures ownership now, instead of waiting until the close of the city-company agreement in 1957.

Conspectus of Indexes for May, 1926

Compiled for Publication in This Paper by
ALBERT S. RICHEY
Electric Railway Engineer, Worcester, Mass.

	Latest	Month Ago	Year Ago	Since War	
				High	Low
Street Railway Fares*	May 1926 7.36	April 1926 7.36	May 1925 7.27	March 1926 7.36	May 1923 6.88
1913 = 4.84					
Electric Railway Materials*	May 1926 153.1	April 1926 154.2	May 1925 153.9	Sept. 1920 247.5	Oct. 1924 148.5
1913 = 100					
Electric Railway Wages*	May 1926 225.4	April 1926 224.7	May 1925 222.2	Sept. 1920 232.0	March 1923 206.8
1913 = 100					
Am. Elec. Ry. Assn. Construction Cost (Elec. Ry.) 1913 = 100	May 1926 202.4	April 1926 201.3	May 1925 202.0	July 1920 256.4	May 1922 167.4
Eng. News-Record Construction Cost (General) 1913 = 100	May 1926 207.3	April 1926 207.0	May 1925 207.2	June 1920 273.8	Mar. 1922 162.0
U. S. Bur. Lab. Stat. Wholesale Commodities 1913 = 100	April 1926 151.1	March 1926 151.5	April 1925 156.2	May 1920 246.7	Jan. 1922 138.3
Bradstreet Wholesale Commodities 1913 = 9.21	May 1926 12.86	April 1926 13.11	May 1925 13.32	Feb. 1920 20.87	June 1921 10.62
U. S. Bur. Lab. Stat. Retail Food 1913 = 100	April 1926 162.4	March 1926 159.9	April 1925 150.8	July 1920 219.2	Mar. 1922 138.7
Nat. Ind. Conf. Bd. Cost of Living 1914 = 100	April 1926 168.4	March 1926 168.5	April 1925 164.8	July 1920 204.5	Aug. 1922 154.5
Steel Unfilled Orders (Million Tons) 1913 = 5.91	Apr. 30 1926 3.868	Mar. 31 1926 4.380	Apr. 30 1925 4.447	July 31 1920 11.118	July 31 1924 3.187
Bank Clearings Outside N. Y. City (Billions)	April 1926 18.65	March 1926 19.50	April 1925 17.82	Oct. 1925 20.47	Feb. 1922 10.65
Business Failures Number	April 1926 1743	March 1926 1882	April 1925 1667	Jan. 1924 2231	Aug. 1925 1353
Liabilities (Millions)	April 1926 47.34	March 1926 46.93	April 1925 50.60	Jan. 1924 122.95	Aug. 1925 27.22

*The three Index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen, conductors and operators on 137 of the largest street and interurban railways operated in the United States, weighted according to the number of such men employed on these roads. Previously the wage index applied to 144 railways. The change is due to dropping some roads where the number of trainmen has been reduced to a total of less than 100.

Since 1912 the \$10,000,000 issue of P. R. T. 5 per cent bonds had been conditionally sold or pledged at a net cost of about 7 per cent; \$8,975,000 of these bonds have now been permanently sold, with interest at 6 per cent.

Early in 1925 P. R. T. offered to its customers \$3,000,000—60,000 shares—of its 7 per cent cumulative preferred stock and in six days 14,000 car riders subscribed to 71,428 shares. The subscriptions were received on the cars with weekly payments thereafter made to P. R. T. trainmen.

It is explained that \$10,000,000 of 7 per cent cumulative P. R. T. preferred stock has just been oversubscribed by P. R. T. car riders, in lots not exceeding 20 shares, without

COMPARATIVE INCOME ACCOUNTS OF THE PHILADELPHIA RAPID TRANSIT COMPANY

Year	Gross Earnings	Maintenance and Renewals	Power-Opr. Conducting Transp. & General	Taxes	Fixed Charges	Net Income
1911.....	\$22,147,974	\$3,661,198	\$8,627,973	\$1,591,253	\$8,827,988	\$560,708*
1912.....	23,282,408	3,492,361	9,097,061	1,659,518	8,961,126	72,342
1913.....	24,240,592	3,636,088	9,081,213	1,660,236	9,324,559	538,496
1914.....	23,961,398	3,594,209	8,825,665	1,808,951	9,531,232	201,341
1915.....	24,315,455	3,647,318	8,677,465	1,783,540	9,622,631	584,501
1916.....	27,279,517	4,091,928	9,382,541	1,812,587	9,614,908	2,377,553
1917.....	29,726,927	4,459,039	10,723,912	2,106,769	9,573,522	2,863,685
1918.....	31,704,427	4,755,664	13,355,575	2,428,819	9,629,553	1,534,866
1919.....	36,039,520	4,955,124	17,287,117	2,345,750	9,735,652	1,715,877
1920.....	39,400,341	5,965,409	20,628,504	2,601,253	9,823,110	382,065
1921.....	42,911,040	8,560,400	19,874,369	2,798,821	9,870,158	1,807,292
1922.....	43,235,972	8,560,400	20,407,117	2,586,001	9,853,177	1,822,777
1923.....	45,552,031	8,560,400	22,479,553	2,695,708	10,016,370	1,800,000
1924.....	46,215,488	8,560,400	22,678,896	2,760,903	10,404,924	1,819,365
1925.....	50,361,568	8,560,400	25,053,203	3,030,824	10,710,414	3,006,727

*Deficit

INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT COMPANY FOR YEAR ENDED DEC. 31

	1925	1924
Gross passenger earnings...	\$48,827,951	\$45,002,700
Other operating revenue....	715,818	652,317
Railway operating revenue.	49,543,769	45,655,017
Way and structures, equipment and power—maintenance, renewals and depreciation.....	8,560,400	8,560,400
Power operation.....	3,738,715	3,772,643
Conducting transportation..	15,898,894	14,313,232
General.....	5,415,593	4,593,019
Taxes, including paving tax.	3,030,824	2,760,903
	36,644,427	34,000,199
Operating income.....	12,899,342	11,654,817
Non-operating income.....	817,798	560,470
Interest.....	13,717,141	12,215,288
Rentals.....	1,399,370	1,371,252
Frankford elevated rental..	8,662,924	8,541,591
Sinking fund—City contract	468,119	312,079
	180,000	180,000
	10,710,413	10,404,924
Net income.....	\$3,006,727	\$1,810,364

CONSOLIDATED INCOME ACCOUNT OF THE PHILADELPHIA RAPID TRANSIT SYSTEM FOR YEAR ENDED DEC. 31, 1925

Gross passenger earnings.....	\$49,911,702
Other operating revenue.....	691,883
	\$50,603,586
Way and structures, equipment and power—Maintenance, renewals and depreciation.....	8,760,903
Power operation.....	3,738,720
Conducting transportation.....	16,612,472
General.....	5,350,881
Taxes, including paving tax.....	3,070,879
	\$37,533,888
Operating income.....	\$13,069,727
Non-operating income.....	416,857
	\$13,486,585
Frankford rental and sinking fund to purchase P. R. T.....	648,119
	\$12,838,465
Fixed charges, dividends, etc.....	12,525,459
Surplus.....	\$313,006

INCOME ACCOUNT OF THE PHILADELPHIA RURAL TRANSIT COMPANY FOR THE YEAR ENDED DEC. 31, 1925

Passenger revenue.....	\$1,005,338
Other revenue.....	26,362
	1,031,700
Operating expenses and taxes.....	1,135,360
Operating income.....	103,659
Non-operating income.....	9,443
	94,216
Fixed charges, etc.....	134,773
Deficit.....	\$828,989
Passengers carried.....	10,817,628
Average rate per passenger, cents.....	9.29

brokerage charges or commissions, during a sales offering upon the cars of ten days duration. More than 40,000 car riders will hold this stock.

Proceeds from this issue will be used toward payments for normal capital expenditures for improvements and extensions, for retiring underlying securities, the cost of South Philadelphia track extensions to serve the Sesqui-Centennial, purchase and rehabilitation of the Frankford, Tacony & Holmesburg Railway and to reimburse the P. R. T. treasury for reserves heretofore used to finance improvements.

Wages of employees during 1925 were based on a rate of 77 cents an hour. The basic wage for 1926 will by agreement be 73½ cents an hour in payment for average services as rendered elsewhere, and will be continued except as it may be adjusted to conform to the purchasing power of the dollar, as set forth in the plan for collective consideration, hereto appended. This change is not made for the purpose of reducing wages, but so that the last 3½ cents an hour of the wage, approximating \$1,000,000 a year, shall, in so far as possible, be made dependent upon the continued efficiencies and economies of the men, to which end it is included as a part of the management's fee.

The report, dated March 1, is concluded with a discussion of the Mitten plan for 1926, in which it is said in part:

The distinctive feature of this plan as compared to others, and the one to which its greatest success is attributed, is that men and management must agree, otherwise arbitration follows. Whereas in other plans, whether the representatives of men and management agree or disagree, their action is subject to final review and approval or veto by the head of the company.

The 1926 plan again reiterates the principle that nothing shall interfere with the right of any employee to become a member of any union or organization, without let or hindrance.

Working conditions are dealt with by

the branch committees, from whose decisions appeal may be taken to departmental and general committees. All books of rules for the direction of employees are submitted to and receive the approval of the departmental committees before being put into effect. No change may be made in such books of rules without the approval of the departmental committees.

Discipline is administered by the management and its representatives in accordance with the rules and as their best judgment dictates, but appeal from any disciplinary act of management may be taken to the branch, departmental and general committees respectively.

Wages are to be determined for each class of employees upon the basis of a fixed rate established by the general committees; change in the wage base thereafter to be in accordance only with the rise or fall in the purchasing power of the dollar. Such changes are to be in relation to the changes in the composite cost of various standard market baskets, as determined upon by the general committees.

Adjustment of wages to the changing purchasing power of the dollar assures protection of the present standards of living. The co-operative wage as here described assures an increasingly higher standard of living, on the one hand, through the added return to employees by their proportionate share of increasing gross earnings, and, on the other, through the investment of this added income in the industry, by the increasing dividends on their growing investment.

P. R. T. employees have been receiving since 1922 a co-operative wage equaling 10 per cent of the payroll, which has been by mutual consent invested in P. R. T. stock—\$10,000,000 par value, 200,000 shares—by trustees of the men, to such good effect that the present average rate of return on the money invested is almost 13 per cent per annum, which sum is paid directly to the men, according to their holdings, by the men's own trustees immediately after the payment by P. R. T. of its quarterly dividends. One-third of P. R. T. common stock is now owned by the men, who vote this stock, through their own trustees.

Beginning with the year 1926, Mitten Management will receive a management fee of 4 per cent of the gross revenue of the system, payable cumulatively after earning the regular dividend to P. R. T. stockholders. In recognition of co-operative effort, this management fee is to be divided equally between men and management, each co-operating regular employee to be credited at the end of the year with his proportionate share.

STREET CAR AND SUBWAY-ELEVATED PASSENGER STATISTICS

	Passengers Carried		Average Rate per Passenger, Cents		Passenger Revenue	
	1925	1924	1925	1924	1925	1924
January.....	76,626,563	78,297,258	5.41	4.79	\$4,148,090.48	\$3,748,595.68
February.....	70,811,587	73,247,920	5.38	4.78	3,807,920.36	3,501,989.71
March.....	78,940,472	79,591,970	5.36	4.78	4,234,351.70	3,802,197.01
April.....	77,999,649	78,235,652	5.36	4.78	4,178,685.85	3,743,361.49
May.....	79,579,698	81,288,979	5.33	4.77	4,240,538.85	3,880,553.43
June.....	74,693,804	75,366,342	5.31	4.77	3,969,166.03	3,591,596.89
July.....	71,601,642	71,989,422	5.28	4.76	3,790,398.32	3,430,594.88
August.....	70,439,444	68,630,403	5.29	4.76	3,721,880.02	3,266,126.70
September.....	81,209,381	77,796,303	5.33	5.40	3,863,437.61	3,490,695.31
October.....	77,846,788	74,087,646	5.33	5.41	4,325,415.53	4,203,772.70
November.....	81,740,396	79,491,612	5.35	5.42	4,151,101.32	4,010,418.26
December.....	81,740,396	79,491,612	5.35	5.42	4,396,965.40	4,332,798.20
Total.....	914,237,126	909,303,945	5.34	4.95	\$48,827,951.46	\$45,002,700.26

Receiver Authorized to Pay July 1 Interest.—Federal Judge Faris has authorized Rolla Wells, receiver for the United Railways, St. Louis, Mo., to pay the July 1 interest coupons on the \$36,300,000 of 4½ per cent bonds of the company. The interest amounts to \$726,000.

Line Abandoned.—The Denver Tramway, Denver, Col., has abandoned its Englewood-Cherrilyn line in favor of buses because of the inability of the company to make the line pay. Back in 1883 horse cars were run on this line. In 1910 the route was electrified. Reference to this plan was made in the JOURNAL for May 15, page 860.

Discontinuance Petition Opposed.—Residents of Blue Island, Harvey and other Chicago suburban towns appeared before the Illinois Commerce Commission in Chicago recently to oppose the petition of the Chicago & Interurban Traction Company to discontinue operation of cars between 63d Street, Chicago, and Kankakee. They stated that there is need for the service in various communities among the approximately 50 miles of route. The line is paralleled for the entire distance by a concrete highway and several steam railroads. Service has been conducted at a loss for a number of years. The hearing was continued.

\$1,000,000 City Railway Notes Are Refunded.—Action of officials in refunding \$1,000,000 three-year notes of the Louisville Railway, Louisville, Ky., which fall due on June 1, 1926, has been approved by the Board of Works. A new issue of 6 per cent notes running for two years from June 1 will take the place of the refunded notes.

Seeks to Abandon Three Miles.—The Utah Rapid Transit Company, operating in Ogden, Utah, has applied to the Public Utilities Commission for permission to abandon 2.94 miles of its electric railway system between North Ogden and Pleasant View. In the same petition the company sets forth that it may later find it necessary to ask permission to abandon the other section of the North Ogden line from the north city limits to North Ogden. Steadily decreasing revenues are given as the reason for the request.

Slight Decrease in Surplus.—For the period from Jan. 1 to March 31, 1926, the Lake Shore Electric Railway, Cleveland, Ohio, had gross earnings of \$780,997, against \$776,608 for a similar period in 1925. The operating expenses and taxes increased from \$636,417 for the 1925 period to \$648,688 in the 1926 period. The surplus showed a decrease. It was \$28,598 for the period from Jan. 1 to March 31, 1925, and \$27,558 for the three months period of the current year.

Bonds for Betterments.—The Indiana Public Service Commission has authorized the Evansville & Ohio Valley Railway, Evansville, Ind., to issue \$16,000 in first mortgage 6 per cent gold bonds at 87½ per cent of par to pay for additions and betterments. According to G. R. Millican, general manager of the company, the bond issue covers an accumulation of small items on improvements, some of which were made during the past year.

Personal Items

New Honor for E. H. Maggard

E. H. Maggard, president of the Petaluma & Santa Rosa Railroad, Petaluma, Cal., was elected president of the California Electric Railway Association at its eleventh annual meeting on May 17. The new head of the association has been in the employ of the Petaluma property since 1907, when he entered the service as general freight and passenger agent. He continued in that capacity until promoted to the office of general manager in 1916, succeeding in that position the late Elmer M. Van Frank. Prior to his association with the California property and at an early age he entered the service of the Missouri, Kansas & Texas Railway at Dennison, Tex., as call boy. Later he was made clerk in the freight office of the Southern Pacific at Houston. He next became identified with the El Paso & Northeastern Railway at El Paso and from that property went to Petaluma.

Changes in Scranton

Lawrence H. Stone has been transferred from the New York office of the General Engineering & Management Corporation to Scranton, Pa., as auditor of the Scranton Railway. The general auditing formerly was done in New York.

C. O. Brooks, formerly connected with the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y., the Third Avenue Railway, New York City, and the Youngstown Municipal Railway, Youngstown, Ohio, has been appointed superintendent of equipment in place of J. F. Duffy, who resigned on May 1. Mr. Brooks' offices are located at the carhouse of the company at Providence Road.

E. L. Austin Heads Sesqui-Centennial

A. C. Baker, director-in-chief of the Sesqui-Centennial celebration in Philadelphia, Pa., has been retired as head of the Sesqui-Centennial and has been relieved of all executive duties because of illness. He will be succeeded by E. L. Austin, business manager and comptroller of the exposition. The career of Mr. Austin, formerly with the Philadelphia Rapid Transit Company, was reviewed in the ELECTRIC RAILWAY JOURNAL, issue of Aug. 1, 1925, page 185.

Promotions at Racine

Emil Jorgenson, who has been connected with the Wisconsin Gas & Electric Company for the past eighteen years, has been promoted to the post of assistant secretary and assistant treasurer, with offices at Racine, Wis. For several years past he has been auditor.

John I. Allen, assistant auditor, who joined the company's forces at Kenosha in 1912 as timekeeper and reached his present post of assistant auditor three years ago, has been promoted to auditor to succeed Mr. Jorgenson.

Alfred H. Marsh has been appointed supervisor of the recently formed accident prevention bureau of the Brooklyn-Manhattan Transit Corporation, Brooklyn, N. Y. Mr. Marsh has been connected with the Brooklyn system more than 34 years. He has had experience as conductor, inspector, dispatcher and depot master in the surface transportation department, and later as investigator and adjuster in the claim department. He also served as special investigator, managing clerk and special adjuster in the law department. In his new work Mr. Marsh will conduct all investigations, tabulate all accidents and make studies of the conditions and hazards pertaining to the various lines.

Leslie Wipperman, who has been manager of the Wisconsin Rapids Street Railway, Wisconsin Rapids, Wis., for many years, has resigned from that post. He has no definite plans for the future. John Shanks, who has been connected with the company's properties at Negoosa, has been selected to succeed Mr. Wipperman.

George T. McIntosh has been appointed statistician for the Winnipeg Electric Company, Winnipeg, Canada.

C. A. Wait, assistant to the president of the Illinois Power & Light Company, Chicago, Ill., has taken over the additional duties of director of public relations of the Illinois Traction System.

R. C. Slye, who has been chief clerk at the Milwaukee, Wis., office of the Chicago, North Shore & Milwaukee Railroad for many years, has been promoted to the post of city passenger agent, giving the Milwaukee office two city passenger agents. C. G. Miles, Fort Wayne, has been appointed Mr. Slye's successor.

T. Justin Moore, general counsel of the Virginia Electric & Power Company, Richmond, Va., was appointed vice-president at a recent meeting of the board of directors. He succeeds E. Randolph Williams.

Obituary

Henry Fleetwood Albright, vice-president in charge of manufacturing and a director of the Western Electric Company, died on May 11. His outstanding contribution was in scientific factory planning and management. He began his business career as an office boy with the Union Pacific Railroad in Philadelphia.

Augustus Barnes, assistant to the president of the People's Motorbus Company, St. Louis, Mo., and the man who obtained the original bus permits for that company, died at the Jefferson Hotel in that city on April 25. He had been ill about ten days. When the Hertz interests entered the St. Louis bus field and the People's Motorbus Company was finally organized Mr. Barnes was named assistant to the president in charge of publicity and public relations.

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

G. E. Will Exhibit at Atlantic City Convention of A. R. A.

At the convention of the Mechanical and Purchases and Stores Divisions of the American Railway Association, to be held at Atlantic City, June 9-16, the General Electric Company will occupy booths 5, 60, 62, 64, 66, 68, 70, 72, 74 and 76. Its exhibits will include electric and oil-electric locomotives, gas-electric cars, a complete line of car shop control equipment, motors, arc welding equipment, flow meter equipment, Fabroil and Textolite gears, floodlighting projectors, fuse cords and phono-electric cells.

Coal Bill Will Be Reported

Assurances have been given the President by Chairman Parker of the House committee on interstate and foreign commerce that a coal bill will be reported by his committee and will be pressed for passage at this session of Congress. The President has been advised further that a majority of the committee has come to an understanding as to the principle of the bill which will be recommended, although the details of the bill have not been worked out as yet.

It was stated at the White House that this information is very gratifying to the President and that he thinks Congress should enact legislation at this session along the lines that have been indicated.

Abuse of Time Selling Plan in Bus Field Is Dangerous

Expressing doubt as to the advisability of selling commercial motor vehicles on the time-payment plan with insufficient down payment and ensuing payments spread out too long, the *Wall Street Journal* for Saturday, May 8, pointed out that the problem of disposing of repossessed buses and trucks is becoming an increasingly important one with the manufacturers. Bankers are sounding a note of warning against the practice mentioned above, which condition has been brought about by the extremely keen competition which has arisen in the commercial motor vehicle field, this having resulted in the extension of unusually liberal terms to prospective purchasers by many of the leading manufacturers. The *Wall Street Journal* states that the report is current in the trade that at least one important manufacturer has on hand nearly \$1,000,000 worth of repossessed vehicles, on which the purchasers have failed to continue their payments, and the smaller concerns are in a relatively similar position.

The *Journal* goes on to state:

When the practice of time selling of trucks and buses was inaugurated, the pur-

chaser was obliged to make an initial payment of at least one-third of the purchase price of the vehicle, plus the cost of insuring it fully. Subsequent payments were spread out over a period of twelve or eighteen months. Recently, however, many truck and bus makers have been financing time sales on a basis which obligates the purchaser to a substantially smaller amount with respect to his initial payment, and subsequent monthly payments are being permitted to run over a period of two years.

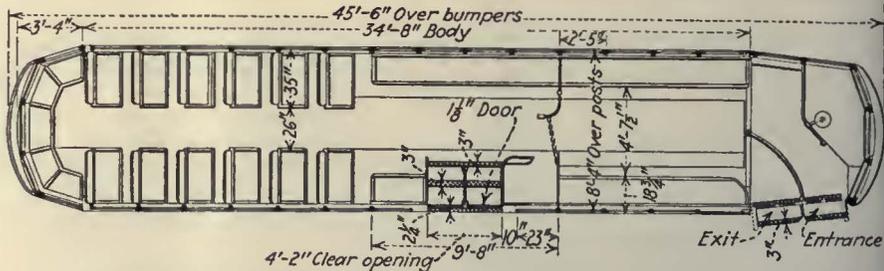
With competition keener than ever before in the history of the commercial vehicle industry, these repossessed machines are becoming an increasingly important problem with the manufacturers. In some instances the vehicles have been depreciated in value

below the amount which has been paid on them, and in others the manufacturer is fortunate if he can turn the unit over again without a loss. This, of course, has an adverse effect upon new vehicle sales.

O. M. Edwards Furnishes Sash for Montreal Cars

It was stated in the issue of *ELECTRIC RAILWAY JOURNAL* for May 8, page 830, that sash fixtures on the 50 new cars being built by the Canadian Car & Foundry Company for the Montreal Tramways would be provided by the National Lock Washer Company. This statement is hereby corrected to read that the cars are entirely equipped with brass sash and fittings furnished by the O. M. Edwards Company. These cars and the sixteen cars for the British Columbia Electric Railway are said to be the first in Canada completely equipped with brass sash.

Fifty New Cars Will Aid with Sesqui Crowds



Delivery of 50 new streets cars recently ordered from the J. G. Brill Company by the Philadelphia Rapid Traction Company is expected to be made prior to June 1, according to an announcement by the car builders. The cars are of single-end construction and are destined to be placed in service to aid with the augmented traffic expected in Philadelphia during the Sesqui-Centennial Exposition. Specifications on the new units follow:

Weight:	
Car body	18,295 lb.
Trucks:	
Front	5,490 lb.
Rear	5,475 lb.
Equipment:	
Electric	6,100 lb.
Air brake	1,500 lb.
Total	36,940 lb.
Bolster centers, length	24 ft. 6 in.
Length over all	45 ft. 6 in.
Truck wheelbase	4 ft. 10 in.
Width over all	8 ft. 6 in.
Height, rail to trolley base	11 ft. 0 1/2 in.
Body	Semi-steel
Interior trim	Statuary bronze
Headlining	Agasote
Roof	Arch
Air brakes	Westinghouse
Armature bearings	Plain
Axles	Carbon Steel
Bumpers	Channel type
Car signal system	Consolidated and Faraday

Car trimmings	Brill
Center and side bearings	Brill
Compressors	GE CP-27-A
Conduits and junction boxes	
Brill galvanized iron junction boxes and Crouse-Hinds and Erie Malleable Iron Works conduits.	Rigid iron conduits
Control	GE type K-68-A
Couplers	Pull socket and portable bar
Curtain	Curtain Supply Co. on 27 cars
fixtures	National Lock Washer on 23 cars
Curtain material	Pantasote
Destination signs	Hunter
Door operating mechanism	National Pneumatic
Energy-saving device	Economy meter
Fenders	H-B lifeguard
Gears and pinions	Tool Steel
Hand brakes	Peacock staffless
Heater equipment	Consolidated
Headlights	Electric Service Supplies
Journal bearings	Plain
Journal boxes	Brill
Lightning arresters	GE type MD-3
Motors	GE-275-B, outside hung
Paint	Lucas
Registers	International
Sanders	Ohio Brass
Sash fixtures	Brill
Seats	Brill
Seating material	Wood slat
Springs	Brill
Step treads	Universal
Trolley catchers	Ohio Brass
Trolley bas	US-14
Trolley wheels	P.R.T. standard
Trucks	Brill 39-E-2
Ventilators	Garland C-1 Junior
Wheels	Rolled steel 28 in. and 22 in.
Special devices, etc.	

"Promet" journal bearings

Changes in North East Service, Inc., Personnel

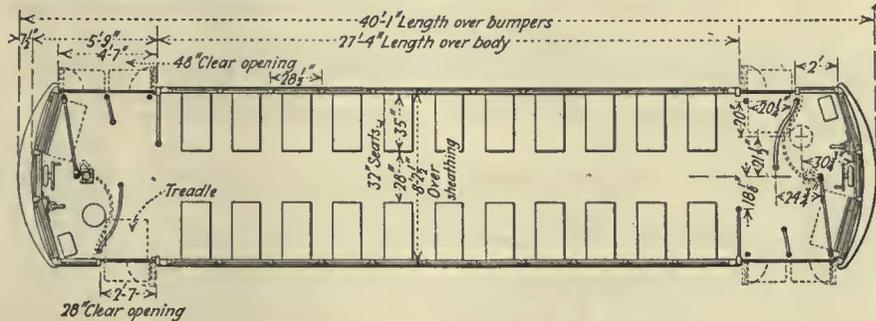
Warren K. Lee, manager of the North East branch at Detroit, has been appointed sales manager of North East Service, Inc., with headquarters at Rochester, N. Y. Mr. Lee joined the North East organization at Rochester in 1915. In 1916 he served with the American troops at the Mexican border as a member of the cavalry contingent of the New York State Militia. Upon his return he was appointed assistant manager of the Chicago branch, where he remained until the United States entered the war in 1917. Mr. Lee then joined the Engineering Corps with a lieutenant's commission and saw active duty in France. At the close of the war he was appointed manager of the Detroit branch, filling the vacancy left by R. J. Kelleher, who was at that time placed in charge of North East activities in Europe.

D. P. Cartwright has been appointed service manager of North East Service, Inc., with headquarters at Rochester, N. Y. Mr. Cartwright came into the North East organization in 1918 as manager of the New York branch. He continued in that capacity until 1925, when he was delegated to make a special trip around the world for the purpose of extending the activities of the North East Service organization in the Orient. For a number of years Mr. Cartwright was a director of the Automotive Service Association of New York. He was made a life member of the association at the time of his departure upon his trip.

W. C. Edwards, assistant manager of the North East branch at Chicago, has been appointed manager of the Detroit branch to succeed Warren K. Lee, who has just taken up his duties as sales manager of North East Service, Inc., at Rochester.

Trainload of Trolley Cars for Richmond, Va.

Seldom are the natives along the right-of-way of one of the country's railroads treated to the spectacle of a whole trainload of street cars being shipped hundreds of miles to their destination. Yet this sight was provided recently when the American Car



Exterior View and Floor Plan of the Richmond Car

Company of St. Louis, Mo., shipped a trainload of fifteen double-truck, double-end safety cars to the Virginia Railway & Power Company, Richmond, Va. Events such as this cannot have other than a most salutary influence upon public opinion, for they provide a very wholesome object lesson on the progressive spirit which is being increasingly shown within the industry. Upon arrival at Richmond the train occasioned much interest among the citizenry. The cars are now in service.

Specifications on the cars, which are of all-steel construction and capable of seating 44 passengers, are appended here:

- Bolster centers, length 17 ft. 10 in.
- Length over all 40 ft. 1 in.
- Truck wheelbase 5 ft. 1 1/2 in.
- Width over all 8 ft. 5 in.
- Height, rail to trolley base 11 ft. 0 in.
- Body All steel
- Interior trim Light colored mahogany
- Headlining Haskellite veneer ceiling
- Roof Arch
- Air brakes Westinghouse
- Axles Brill
- Bumpers Channel iron

- Car signal system Faraday
- Car trimmings Statuary bronze
- Center and side bearings Brill
- Compressors DH-16
- Control K-35
- Curtain fixtures National Lock Washer
- Curtain material Double-faced Pantasote
- Destination signs Hunter illuminated
- Door-operating mechanism American Car Co.
- Enamel Pratt & Lambert Vitralite
- Energy-saving device Economy meters
- Fare boxes Johnson
- Fenders H-B lifeguard
- Gears and pinions Westinghouse
- Hand brakes Peacock staffless
- Heaters, Consolidated double-coil truss plank
- Headlights Ohio Brass type ZP
- Journal boxes Brill
- Lightning arresters Westinghouse
- Motors Westinghouse No. 503 inside hung
- Sanders American Car Co.
- Sash fixtures Schechter post casings, etc.
- Seats Brill Waylo
- Seating material "Friezette" plush
- Springs Brill
- Step treads Feralun
- Trolley catchers Ohio Brass
- Trolley base Ohio Brass
- Trolley wheels Ohio Brass
- Trucks Brill No. 177-E-1 friction bearing
- Ventilators Railway Utility double honeycomb
- Wheels Standard Rolled Steel Co. 26-in. diameter
- Special devices, etc. Root air-operated track scrapers



Fifteen Cars Being Delivered to Virginia Railway & Power Company

Customer	Number	Model
Public Service Transportation Co., Newark, N. J.	54	Gaa-electric chassis
Tulsa Street Railway, Tulsa, Okla.	3	X, 21-passenger city service
Indianapolis Street Railway, Indianapolis, Ind.	3	Z, 29-passenger city service
United Electric Railways, Providence, R. I.	10	Z, 29-passenger city service
Wisconsin Power & Light Company, Fond du Lac, Wis.	1	Y, Parlor coach
	2	Z, 29-passenger city service
Nashville, Chattanooga & St. Louis Motor Transit Co., Nashville, Tenn.	3	Z, 29-passenger city service
Fifth Avenue Coach Company, New York, N. Y.	5	Y, Parlor coach
Key System Transit Co., Oakland, Cal.	3	X, 21 passenger city service
Joliet Transportation Co., Joliet, Ill.	1	Z, 29-passenger city service
Montreal Tramways, Montreal, Quebec, Canada	5	Z, 29-passenger city service
East St. Louis & Suburban Railway, East St. Louis, Ill.	4	Z, 29-passenger city service
Illinois Power & Light Corporation, Quincy, Ill.	2	X, 21-passenger city service
Illinois Power & Light Corporation, Galesburg, Ill.	2	X, 21-passenger city service
City Railway, Los Angeles, Cal.	1	Z, 29-passenger city service
Illinois Power & Light Corporation, Peoria, Ill.	2	X, 21-passenger city service

101 Yellows Sold to Railways in April

For the month of April, the Yellow Truck & Coach Manufacturing Company reports deliveries of bus equipment to railway and traction companies as shown in the above table.

North Shore Cars Being Rushed

After a trial run, during which they attained a speed of 75 m.p.h., eight new all-steel passenger motor cars recently received by the Chicago, North Shore & Milwaukee Railroad at Highwood, Ill., from the Cincinnati Car Company have been pronounced satisfactory in every particular and are ready for service on the new Skokie Valley division, which will be opened about June 1.

The new equipment is part of an order placed last fall for twenty passenger cars and two dining cars. Delivery has been speeded up in order to have the additional equipment in service by June 24, when more than a million delegates to the International Eucharistic Congress are expected to entrain for Mundelein, Ill. The motors are being installed in the company's shops at Highwood as fast as the cars are received.

Rolling Stock

Chicago, North Shore & Milwaukee Railroad, Chicago, Ill., has received one six-cylinder type observation parlor car from the Fageol Motors Company of California.

Nashville Railway & Light Company, Nashville, Tenn., has just received one Differential car from the Differential Steel Car Company of Findlay, Ohio. This car is equipped with GE-275 motors and K control.

Metal, Coal and Material Prices

Metals—New York	May 25, 1926
Copper, electrolytic, cents per lb.	13.80
Copper base, cents per lb.	16.00
Lead, cents per lb.	7.65
Zinc, cents per lb.	7.20
Tin, Straits, cents per lb.	61.00
Bituminous Coal f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	\$4.425
Somerset mine run, Boston, net tons	1.925
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
Terpentine (bbl. lots), N. Y., per gal.	\$0.86

Victorian Railways, Melbourne, Australia, has received one six-cylinder parlor car chassis from the Fageol Motors Company of California.

Track and Line

Philadelphia, Pa.—One bid was received by the City Transit Department on May 21 for the contract for supplying the rails for the Broad Street subway and the contract was at once awarded. The single proposal was from the Bethlehem Steel Company, Bethlehem, Pa., and its offers for the 2,884 tons of rails, 205,000 spikes, nutlocks and bolts is \$172,541. The third section of the rail equipment contract for the Broad Street subway is covered in a call to be issued for bids for the special trackwork in the Fern Rock terminal. The bids will be opened by Director of City Transit Ehlers on June 26. The advertised call for proposals enumerates rails, frogs, switches, crossings, tie-plates and all appurtenant equipment for the terminal. Call for the special trackwork, such as switches, crossovers, sidings and frogs for the main line is being advertised now, and these bids are to be opened on June 16. Contract for finishing the stations will soon be let.

Nashville Railway & Light Company, Nashville, Tenn., has been petitioned to extend its Buena Vista line across the Hydes Ferry bridge to Jordonia. The railway is willing to make the extension provided it is assured patronage sufficient to offset the expenditure.

Birmingham Electric Company, Birmingham, Ala., has been granted a franchise for a single-track car line on Twenty-first Street. The track will be utilized in rerouting East Lake cars.

Memphis Street Railway, Memphis, Tenn., has been engaged in many construction jobs, included in which is the improvement of Marshall Avenue from Third Street to Marshall Avenue. The street is being widened to 49 ft. between curbs from Third Street to Lauderdale Street. The present wood block paving from Third to Fourth is being replaced by sheet asphalt. New 7-in. A.E.R.E.A. standard rail is being laid between Third and Piomingo Streets. The company recently completed overhauling the tracks on Thomas Street from the Union Railway crossing to the end of the line. Early in the present year the company began rebuilding the tracks on Fifth Street and on Sixth Street. New 7-in. A.E.R.E.A. creosoted ties and steel base plates are being installed. It is estimated that the work will take about two months to complete.

Power Houses, Shops and Buildings

Virginia Electric & Power Company, Richmond, Va., has started work on the construction of a modern bus terminal repair shop at the corner of Davis and Grayland Avenues. The new bus terminal, when completed, will represent an investment of approximately \$20,000. It will be used as headquarters for the fleet of buses operated by the company in Richmond. Plans for the shop were designed by Allen J. Saville, Inc. This firm will also undertake the construction of a concrete building which will be 50 ft. x 140 ft. in dimension, a size adequate to handle the company's buses. The bus terminal will be used also as a repair shop and will be thoroughly equipped with machinery for undertaking all classes of repairs.

Trade Notes

H. B. Sauer has been appointed manager of the Detroit branch of Timken Roller Bearing Service & Sales Company. He was formerly assistant branch manager at Cleveland.

Samuel D. Hibben has been placed in charge of the combined engineering and illuminating department of the Westinghouse Lamp Company. Under his supervision will be grouped the commercial engineering department and the illuminating bureau, the consolidated activities to be known as a new commercial engineering department. His headquarters will be removed from 150 Broadway, New York, N. Y., to the company's plant at Bloomfield, N. J.

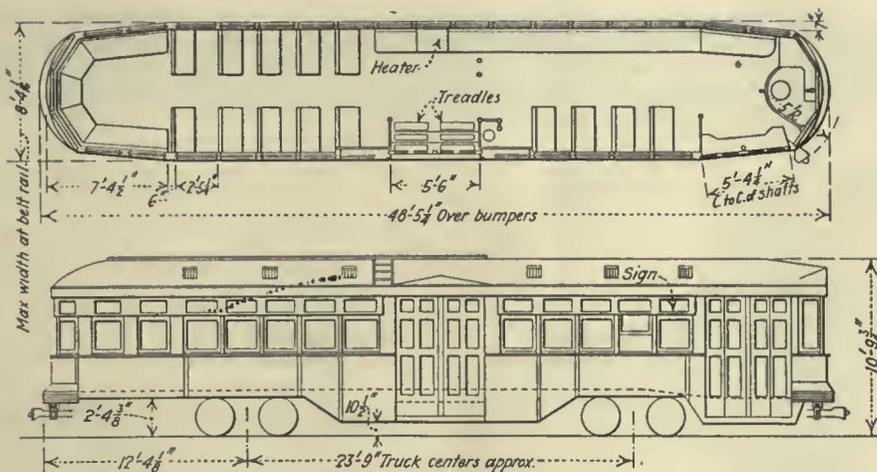
P. F. Rose, formerly assistant branch manager of the Timken Roller Bearing Service & Sales Company, has been appointed branch manager of its Cincinnati office.

Edward J. Doggins has joined the sales staff of the Eisemann Magneto Corporation, New York, N. Y. For the past four years he has acted as credit manager of the company and now covers the Southeastern territory. Stephen M. Cargill, Jr., succeeds Mr. Doggins as credit manager. Mr. Cargill was a former credit investigator for R. G. Dun's Commercial Agency.

New Advertising Literature

Sangamo Electric Company, Springfield, Ill., has issued a booklet giving instructions for the use of Sangamo D5 watt-hour meters.

Reo Motor Car Company, Lansing, Mich., has published a booklet which contains the editorials on bus operation which have appeared in back numbers of *Reo Bus News*. The foreword states that the book was prepared in response to many inquiries for these editorials, coming from various universities as well as engineering concerns. A number of editorials by Carl Parker are included giving pertinent suggestions as to the proper co-ordination of bus and railway service. Copies of this attractively edited booklet may be obtained from the Reo company.



Detroit figures on more cars!

Modern cars—of course

Peacock Staffless Brakes—of course!

The industry certainly is taking hold of the modern car idea. And rightfully so! It is putting the breath of new life into passenger receipts and revealing major economies in operating and maintenance costs.

Here is Detroit in the market for more of them. And like Detroit's other cars of recent years the Peacock Staffless Brake is an integral part of the equipment for insuring passenger safety.

National Brake Co., Inc.

890 Ellicott Sq., Buffalo, N. Y.

Canadian Representative:

Lyman Tube & Supply Company, Limited, Montreal, Canada.



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ROEBLING

WELDING CABLE

ELECTRICAL WIRES and CABLES

John A. Roebbling's Sons Company, Trenton, N. J.

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 out utmost care
and skill just as do large orders. CAMERON quality applies to
every coil or segment that we can make, as well as to every
commutator we built. That's why so many electric railway men
rely absolutely on our name.

Cameron Electrical Mfg. Co., Ansonia, Connecticut

BRAZED Rail Bonds ARC WELD
Portable Arc Welding Outfits
The Electric Railway Improvement Co.
Cleveland, Ohio

Northern **CEDAR POLES** Western
We guarantee
all grades of poles; also any butt-treating specifications
BELL LUMBER COMPANY
Minneapolis, Minn.



KALI

If you wish to murder your enemy by proxy in India—
worship Kali, at the same time killing a goat, and
calling it by your enemy's name during the ceremony.

Getting rid of anything you hate is the finest kind of
business—especially the misapplied carbon brushes that
get your goat and money.

They're the enemy of good commutation.

The way to do it is to kill the requisition that specifies
such brushes—making out a new one in the name of
Morganites.

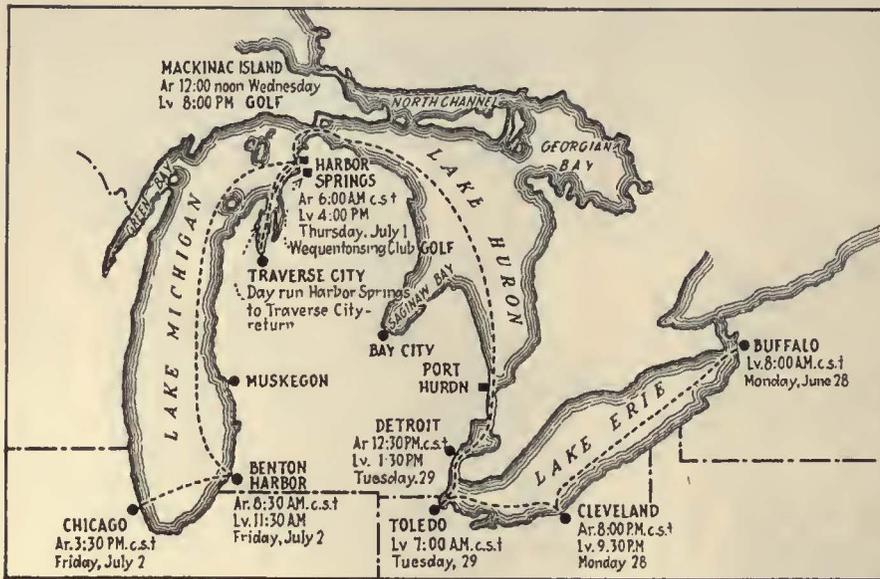
They'll be friendly for life.

Morganite
Brush Co., Inc.

Main Office and Factory
519 West 39th St., New York

DISTRICT ENGINEERS AND AGENTS

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A Cruise of business
Pleasant Companionship
and Recreation
Central Electric Railway Association
SUMMER MEETING
June 28th to July 2nd

Combines all of the above in its instructive meetings aboard the ship, its friendly gatherings on the decks, its golf at Mackinac and Harbor Springs and its bathing at Mackinac.

The Ship The South American
The finest cruising Steamer on
The Great Lakes

The time most convenient

Starting from Buffalo Monday morning, June 28th, from the Lackawanna Dock foot of Main Street at 8 o'clock Central Standard Time, nine o'clock Eastern Standard time.
From Cleveland the same evening at 9:30 C.S.T.
From Toledo Tuesday morning at 7:00 C.S.T.
From Detroit Tuesday afternoon at 1:30 C.S.T.
At Mackinac Island Wednesday from noon until evening for golf, bathing and sight-seeing.
At Harbor Springs Thursday morning for golf for the golfers for others a cruise in Traverse Bay.
Reach Benton Harbor Friday morning shortly after breakfast time and Chicago at 3:30 in the afternoon.

Costing only \$40.00 for a five-day cruise, Buffalo to Chicago, including meals and berth—slightly less from Cleveland, Toledo or Detroit

All Electric Railway men invited. For information, reservations and tickets write

JOHN BENHAM, Vice President
The International Register Co., 15 South Throop Street, Chicago, Ill.



Arch Rock at Historic Mackinac Island



Old Fort at Historic Mackinac Island

GET YOUR RESERVATIONS IN EARLY



To Standardize or Not to Standardize

Railway operators buy standard equipment but they do not buy from standard salesmen. It takes *individuality* to sell and if the manufacturer's representatives all wore a standard uniform and told the same story, in the same tone of voice, they would surely fail to interest you.

Advertising, like selling, should be individualized rather than standardized. Yet advertisers in the railway field are inclined to follow standard formulae.

Why should this be so? The equipment salesmen do not feel this way. Nor do advertisers in other fields.

Most people, in fact, actually *enjoy* reading the advertisements in a general magazine. You turn to them perhaps before you turn to the regular stories and articles and this is solely because they are humanized rather than formularized and unusual rather than uniform.

There is little standardization, for instance, in the advertising pages of the Saturday Evening Post or of your Sunday Newspaper. Here are advertisements

launched with highest hope and conviction that business will result. They are vital, living advertisements, widely varying in nature and appeal.

Is not transportation equally vital? Cannot the discussion of a field coil or axle bearing be made just as interesting as the discussion of an ice box or electric toaster? We believe that it can, for advertising is not a standardized procedure. It is an open sea of sales promotion possibilities and any number of effective courses can be followed to produce results.

In transportation work, of course, these courses must be followed with true knowledge of the industry's problems. We are specialists in transportation advertising and, in advertisements which bear our lighthouse trade mark, we have tried to combine true understanding of the industry's requirements with a variation in appeal, an individuality in presentation and a touch of human interest which secures a reading and promotes response.

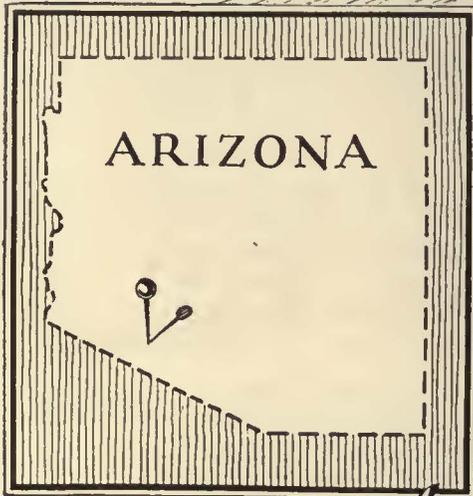
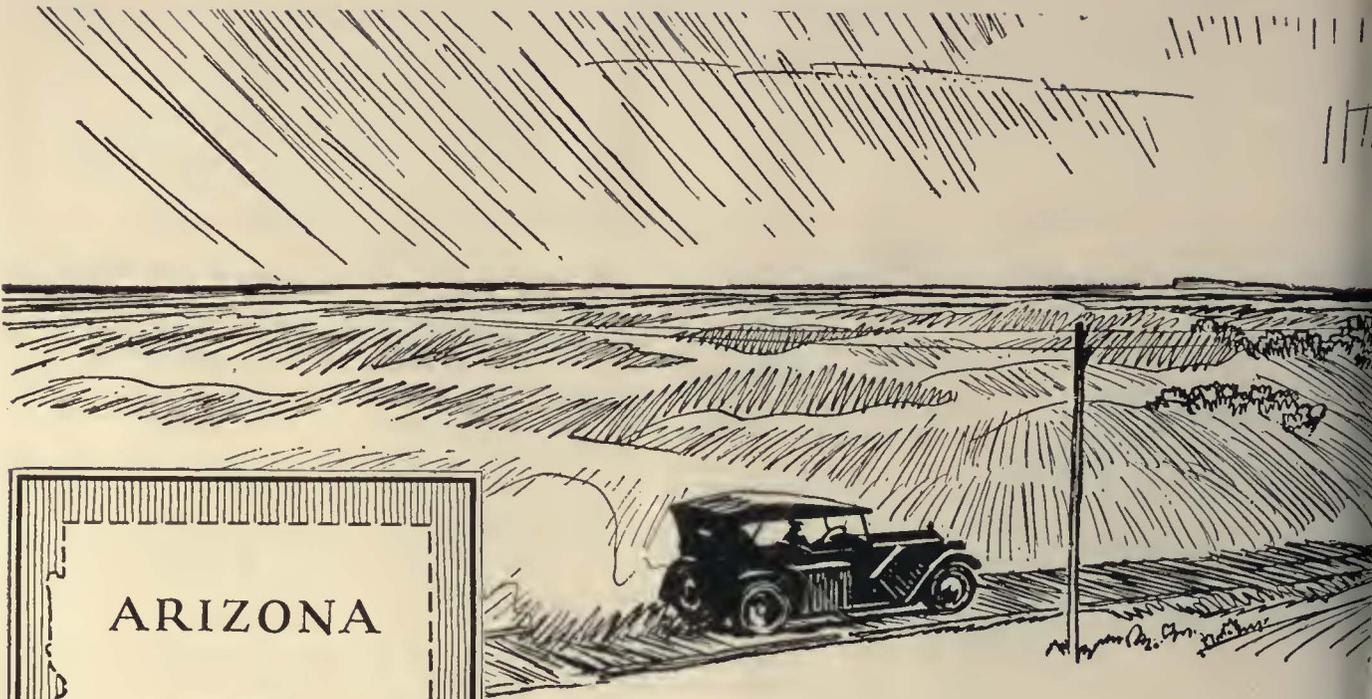


Doyle, Kitchen & McCormick, Inc.

2 WEST 45th STREET, NEW YORK.



An Advertising Agency



Blazing a Trail

*Across a hundred miles of desert
~following the winding trail along wind-swept sand dunes~over conduroy roads~
Puffed and chugged an automobile*

The McGraw-Hill Publications

- MINING
ENGINEERING & MINING JOURNAL-PRESS
COAL AGE
- ELECTRICAL
ELECTRICAL WORLD JOURNAL OF ELECTRICITY
ELECTRICAL MERCHANDISING
- INDUSTRIAL
AMERICAN MACHINIST INDUSTRIAL ENGINEER
CHEMICAL & METALLURGICAL ENGINEERING
POWER
- CONSTRUCTION & CIVIL ENGINEERING
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ELECTRIC RAILWAY JOURNAL
BUS TRANSPORTATION
- RADIO
RADIO RETAILING
- OVERSEAS
INGENIERIA INTERNACIONAL
AMERICAN MACHINIST
(European Edition)
- CATALOGS & DIRECTORIES
ELECTRICAL TRADE CATALOG RADIO TRADE CATALOG
KEYSTONE CATALOG KEYSTONE CATALOG
(Coal Edition) (Metal-Quarry Edition)
COAL CATALOG COAL FIELD DIRECTORY
ELECTRIC RAILWAY DIRECTORY
CENTRAL STATION DIRECTORY
ANALYSIS OF METALLIC AND NON-METALLIC MINING,
QUARRYING AND CEMENT INDUSTRIES

IT was taking a McGraw-Hill field man across the Yuma Desert to the only spot in Arizona at which there was a generating station, with as much as 1000 kw. capacity, where a McGraw-Hill Publication was not received and read.

He got his man and back came the laconic report, "Pull that red tack off the map!" And out it came.

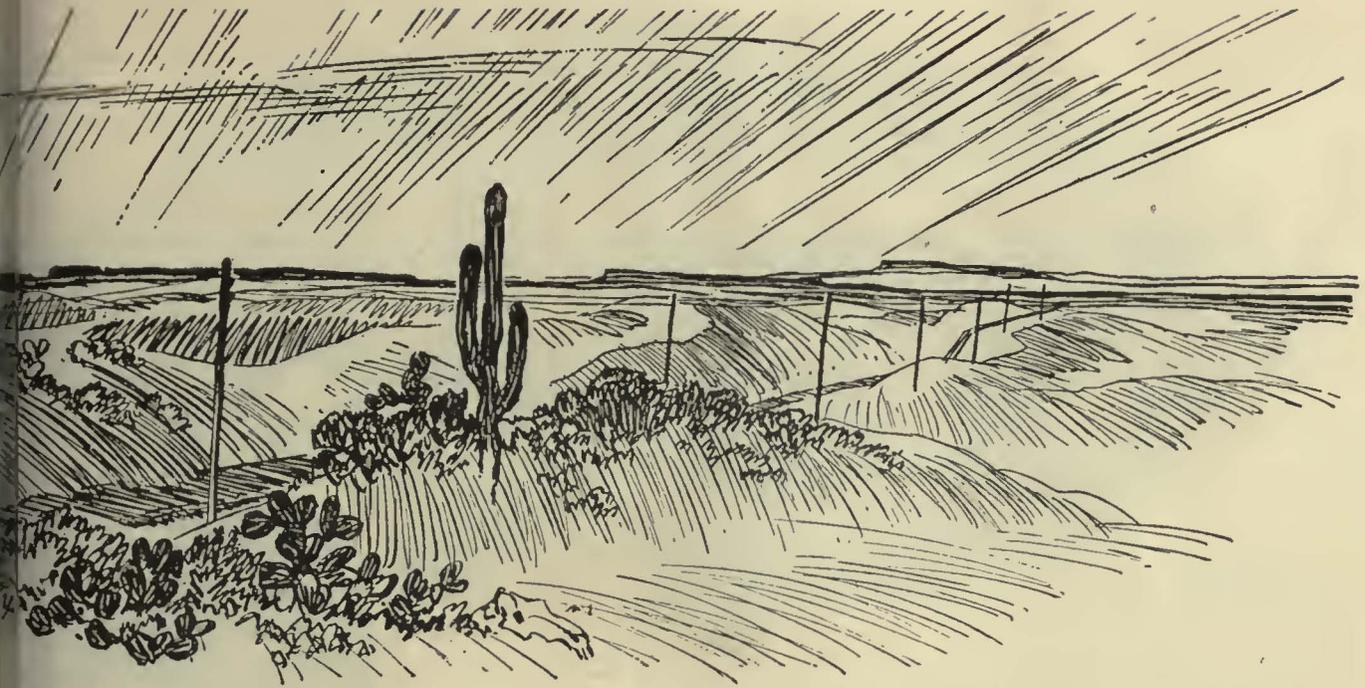
Red tacks, representing uncovered plants, are getting fewer and fewer on the big map in the McGraw-Hill Publications offices. One by one they come out as McGraw-Hill men, located in every state in the Union, visit the important industrial plants.

A recent analysis of subscriptions to McGraw-Hill Publications in Erie County, N. Y., shows that 80% of industrial buying power in that district is covered—100% in some industries. Erie County is a typical sample of McGraw-Hill circulation throughout the country.

Accepting the responsibility which goes with leadership, McGraw-Hill Publications recognize an obligation to cover their respective fields. Every worth while unit of industry, regardless of location, is a prospect and must be sought regardless of cost.

Your Prospects as well as Ours

The manufacturer selling to industry is striving to make customers of precisely these same units.



to your Customer's Door!

We know they are the same, for they are industry's real buyers. The list of their names is an industrial directory of America. McGraw-Hill records and analyses, compiled through years of research, show the physical rating of the individual plants and their purchasing power.

Subscribers are hand picked in advance on the basis of the positions they fill, from corporation president to the key men responsible for operation and production the men who influence or control purchases.

Is your own selling, or your client's selling to these prospects based on pre-analysis of the market on accurate knowledge of buying power on waste-free selling effort, which result when the *McGraw-Hill Four Principles of Industrial Marketing* are applied? These principles, upon which McGraw-Hill subscriptions are built, are:

MARKET DETERMINATION—An analysis of markets or related buying groups to determine the potential of each. With a dependable appraisal of each market, selling effort can be directed according to each market's importance.

BUYING HABITS—A study of the selected market groups to determine which men in each industry are the controlling buying factors and what policies regulate their buying. Definite knowledge eliminates costly waste in sales effort.

CHANNELS OF APPROACH—The authoritative publications through which industries keep in touch with developments are the logical channels through which to approach the buyer. In a balanced program of sales promotion these publications should be used effectively and their use supplemented by a manufacturer's own literature and exhibits.

APPEALS THAT INFLUENCE—Determining the appeals that will present the product to the prospective buyer in terms of his own self-interest or needs.

We offer to industrial manufacturers everywhere the fruits of our accumulated experience in evolving, proving and applying these Four Principles. At each of the McGraw-Hill offices are Marketing Counselors who will be glad to lay complete data before you or your advertising agent. You can communicate with our nearest office and arrange a consultation, when and where you please.

70 salaried circulation field men cover industry in every state in the Union.

They travel 500,000 miles a year.

220,000 subscribers pay for 10,000,000 copies of McGraw-Hill Publications yearly.

50,000 McGraw-Hill subscribers change their addresses each year, and tell us so.

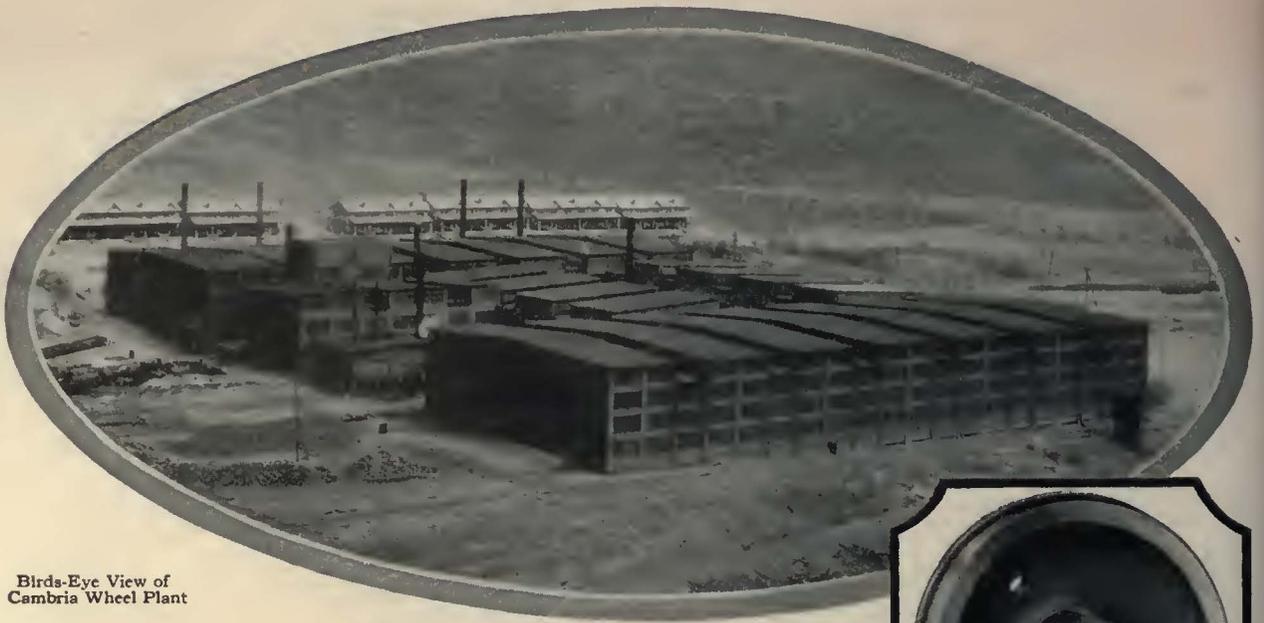
Only 1 out of every 7,800 copies of McGraw-Hill Publications mailed is returned by P. O. Dept. for better address.

In a year's period 18,000 paid subscribers obtained for Radio Retailing, a record in business paper publishing.

McGraw-Hill Publishing Company, Inc., New York, Chicago, Philadelphia, Cleveland, St. Louis, San Francisco, London

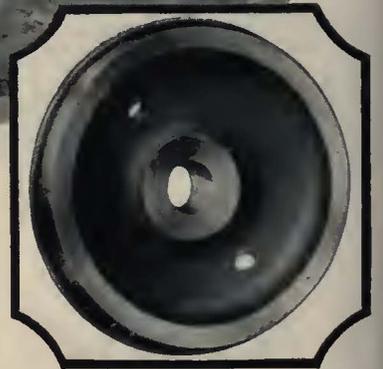
McGraw-Hill Publications

45,000 Advertising Pages used Annually by 3,000 manufacturers to help Industry buy more effectively.



Birds-Eye View of
Cambria Wheel Plant

Forged *then* Rolled —to Give Longer Life



Cambria Wheels are made by a combined forging and rolling process which gives them great durability and an exceptionally long life.

The forging process gives strength, toughness and density to the metal, while the rolling establishes a grained

structure which prevents breakage and crystallization.

Long experience in the manufacture of wheels and control over materials assure you of a product of the highest quality and finest workmanship.

Cambria Forged Car Axles



Cambria Car Axles are made of the same fine quality as Cambria Wheels and can be furnished smooth forged or rough turned all over; solid or hollow bored; rough turned on journals and wheel seats; heat treated or untreated.

A Few Bethlehem Railway Products

for Electric Railways include Tee and Girder Rails; Machine Fitted Joints; Splice Bars; Hard Center Frogs; Hard Center Mates; Rolled Alloy Steel Crossings; Abbott and Center Rib Base Plates; Rolled Steel Wheels and Forged Axles; Tie Rods; Bolts; Tie Plates and Pole Line Material.

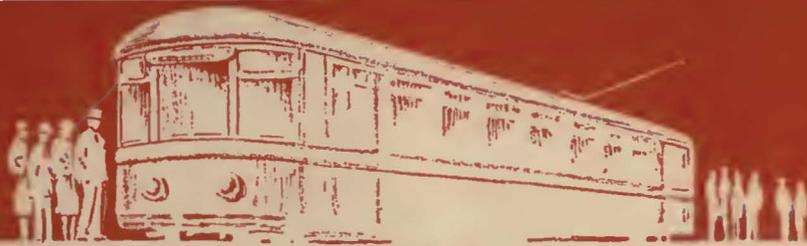
BETHLEHEM STEEL COMPANY, *General Offices:* BETHLEHEM, PA.

DISTRICT OFFICES

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh
Buffalo Cleveland Detroit Cincinnati Chicago St. Louis San Francisco Seattle Los Angeles
Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM

CAMBRIA CAR WHEELS AND AXLES



Grand Rapids Sets the Pace!

“in modernizing their equipment”

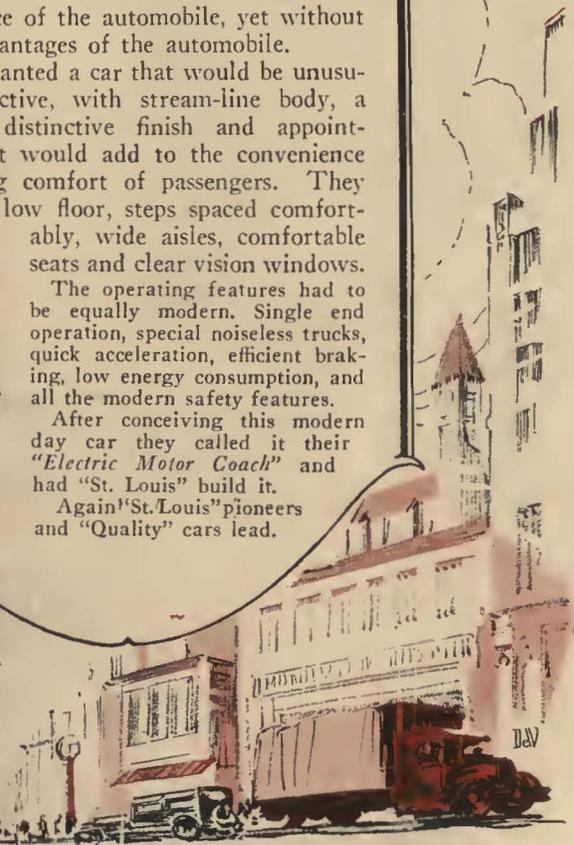
They wanted a car of character!—a car built to new and unusual specifications,—one that would impress the Grand Rapids public with the fact that the obsolete type of car was being discarded. They wanted a car that would have all the comfort and convenience of the automobile, yet without the disadvantages of the automobile.

They wanted a car that would be unusually attractive, with stream-line body, a beautiful distinctive finish and appointments that would add to the convenience and riding comfort of passengers. They wanted a low floor, steps spaced comfortably, wide aisles, comfortable seats and clear vision windows.

The operating features had to be equally modern. Single end operation, special noiseless trucks, quick acceleration, efficient braking, low energy consumption, and all the modern safety features.

After conceiving this modern day car they called it their “Electric Motor Coach” and had “St. Louis” build it.

Again! “St. Louis” pioneers and “Quality” cars lead.

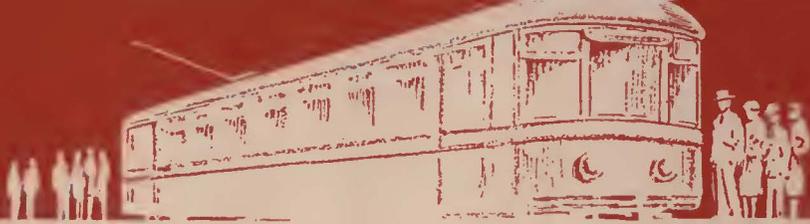


built by—

St. Louis Car Co.

St. Louis, Missouri





In St. Louis E.I.B. trucks, no effort has been spared to produce balanced lightness, with adequate strength, plus quietness, riding comfort and smoothness of operation hitherto not attained in street railway operation.

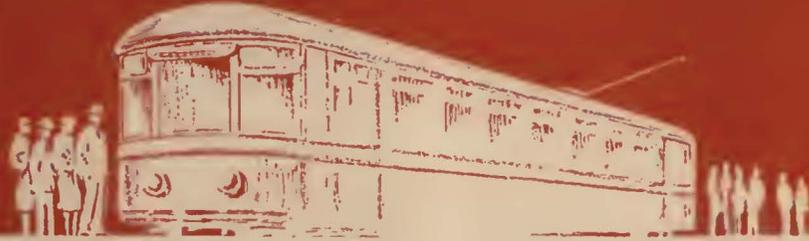
The equalizers are so designed that roller bearings or plain bearings can be used *without changing the journal box.* This is the first type of truck so constructed and a distinct advance in truck engineering.

MODERN *appearance*

THESE new cars are attractive to look at. You will agree to that when you see them. Even the color combinations are pleasingly different. The lines are unbroken—stream line in effect. The panels are smooth, with no rivets showing. The belt rail is continuous. There are double headlights, practical as well as pleasing to look at, an automobile type of bumper front and rear, a large adjustable one-piece windshield. There is a sun visor over the windshield and a concealed flood light over the dash. There is an automobile type stop-light and there are step lights for both front and rear doors. The skirt is hinged—a splendid arrangement that adds to the stream line appearance of the car and at the same time provides easy accessibility.

built by—
St. LOUIS Car Co.





Notice the studied tilt of these comfortable individual seats. They are made with coil springs and are of the double cushion air type. Width over all 36-in. Designed and built by St. Louis Car Co.



MODERN *comfort*

TO SEE the interior of this car is to appreciate its appeal to a comfort loving public. Wide aisles, large attractive dome lights, bright cheerful rubber tiling on the floor, and panelling of rich mahogany.

The seats are unusual—Full leather upholstery, deep luxurious seat cushions, form-fitting individual backs, tilted to insure maximum comfort. They were *built* by the St. Louis Car Company and are, we believe, unexcelled for comfort, good taste and beauty of design.

There is a Club smoking compartment in the rear, with an exit door operated by an automatic step treadle.

Grand Rapids cars represent a combination of practical utility with beauty, good taste with enduring car construction, speed with safety and economy of operation that cannot fail to secure the enthusiastic endorsement of the riding public.

built by—
St. Louis Car Co.

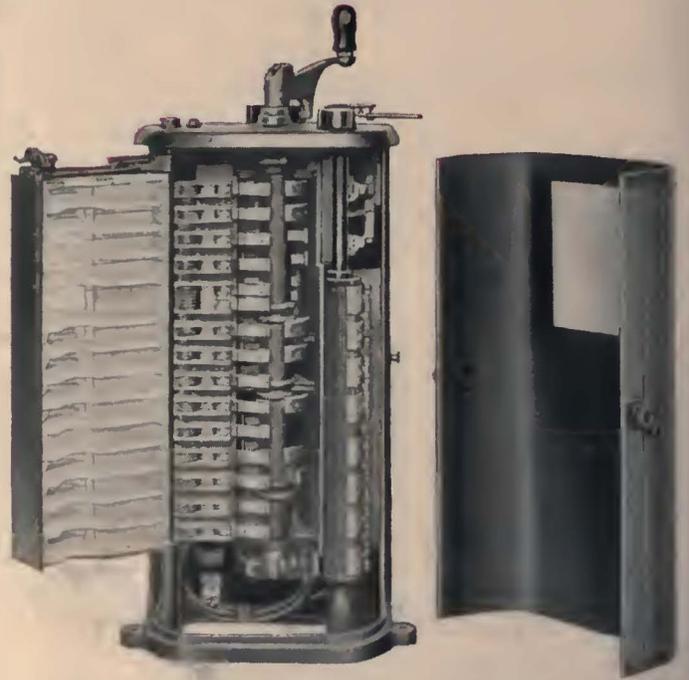




Stepping up the speed—



K-35 single-end Control with G-E Line Breaker

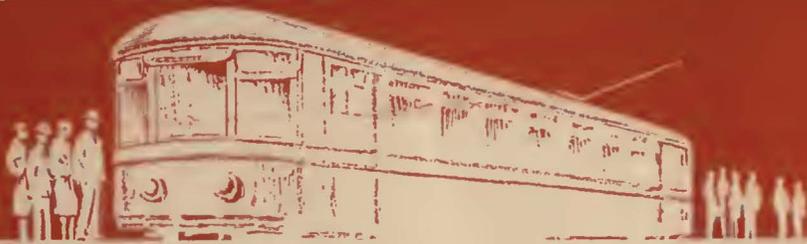


The modernization of rolling stock is the biggest single problem before the industry. The cooperation of General Electric is offered for the development of any improvement or the production of any electrical equipment necessary to carry out a program of modernizing equipment. Many instances can be cited in which modern G-E equipped cars have achieved notable savings or developed new sources of revenue.

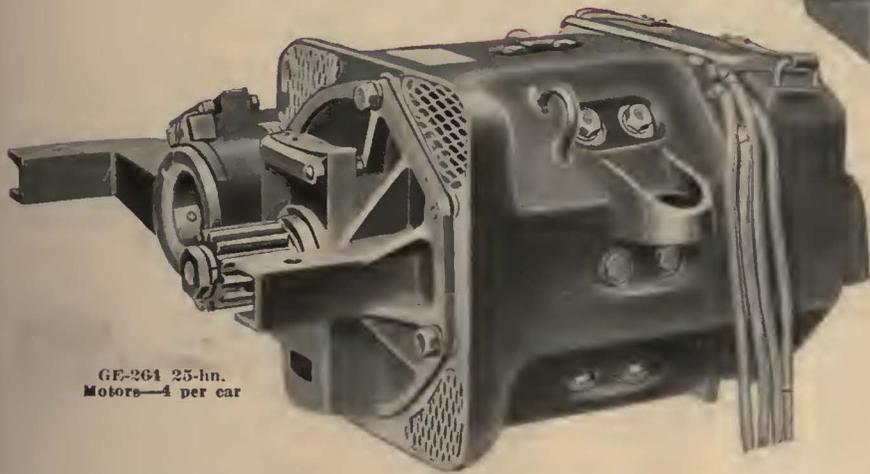
SINCE the A.E.R.A. Convention exhibits last fall, all eyes have been focussed on the Grand Rapids Railway's experiment in transportation. This road, departing radically from established precedent, introduced cars designed primarily to attract patronage and promote public good will.

The facts obtained at Grand Rapids with the three original model cars, which developed a schedule speed of 9.5 miles per hour, showed that energy consumption could be reduced 41%, and passengers per car-mile increased nearly 63%. This was proof enough that modern cars pay.

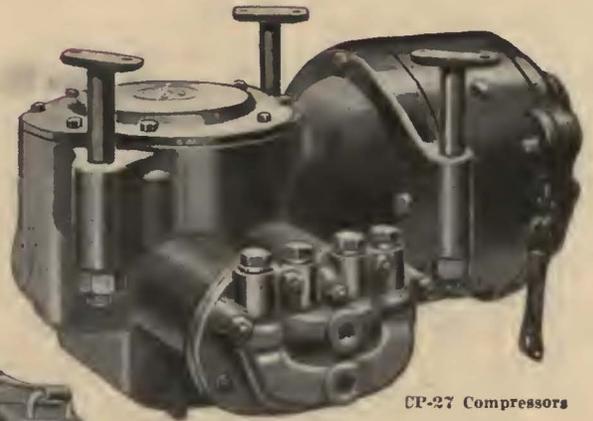
GENERAL



stepping down the costs



GE-264 25-hp.
Motors—4 per car



CP-27 Compressors



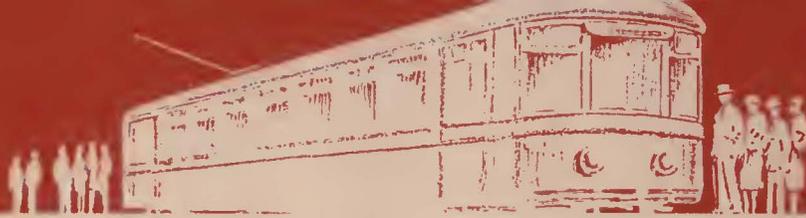
G-E Non-resonant Gears—
for 23 of the 27 cars

The success of this practical experience with ultra-modern light-weight rolling stock again establishes the success of General Electric modern car equipment, which was furnished for two of the trial cars and which was specified for all of the 27 new cars for the Grand Rapids property.

Even more significant is the fact that here is an instance of a large holding company which sees the advantage of standardization of car design and which is proceeding toward complete modernization of the car equipment operated by its many properties in the Middle West and South.

330-26

GENERAL ELECTRIC



DAVIS "One-Wear"

The economy, and the sound principles of design embodied in the Davis "One-Wear" Steel Wheel, have led to their choice as part of the modern cars.

In these days of specialization on service, the elimination of maintenance becomes the deciding factor in the selection of equipment.

The Grand Rapids Railway Company in their quest for the ultra modern car, have adopted the Davis "One-Wear" Steel Wheel as standard equipment, chiefly because of their safety, lightweight and wear resisting qualities.

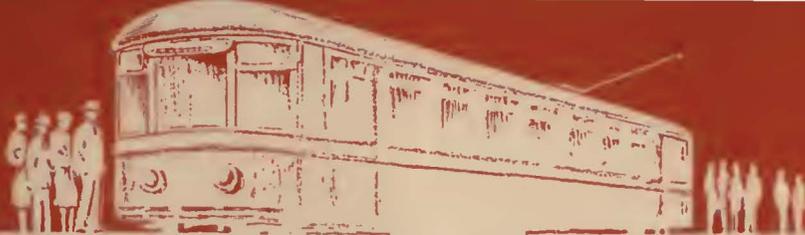
AMERICAN STEEL FOUNDRIES

NEW YORK

CHICAGO

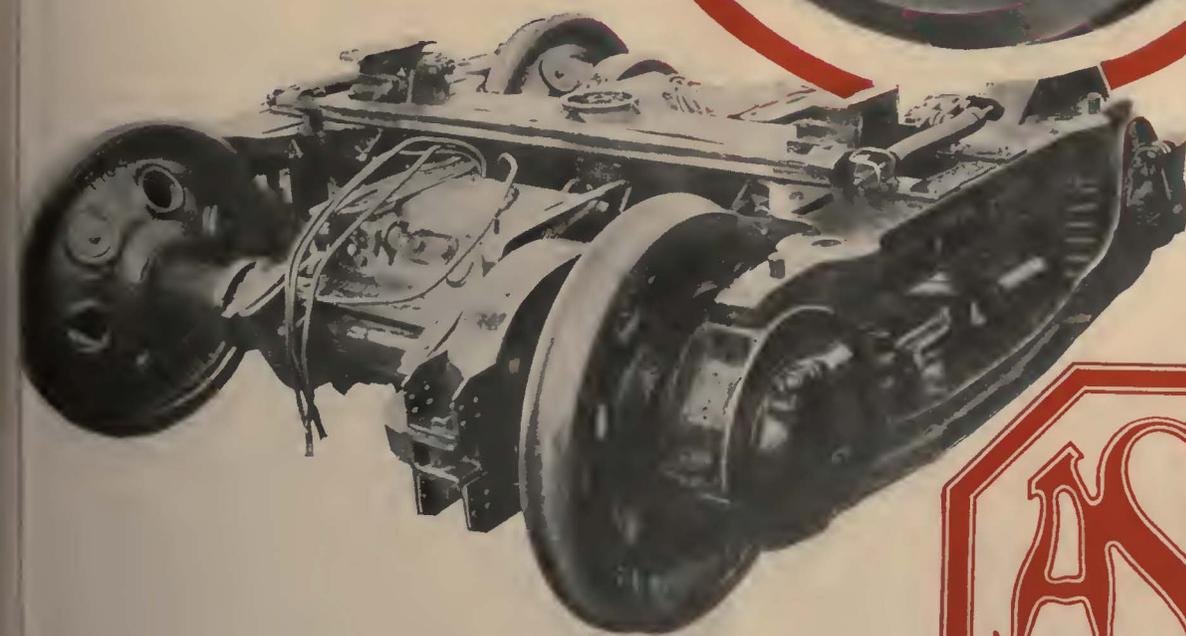
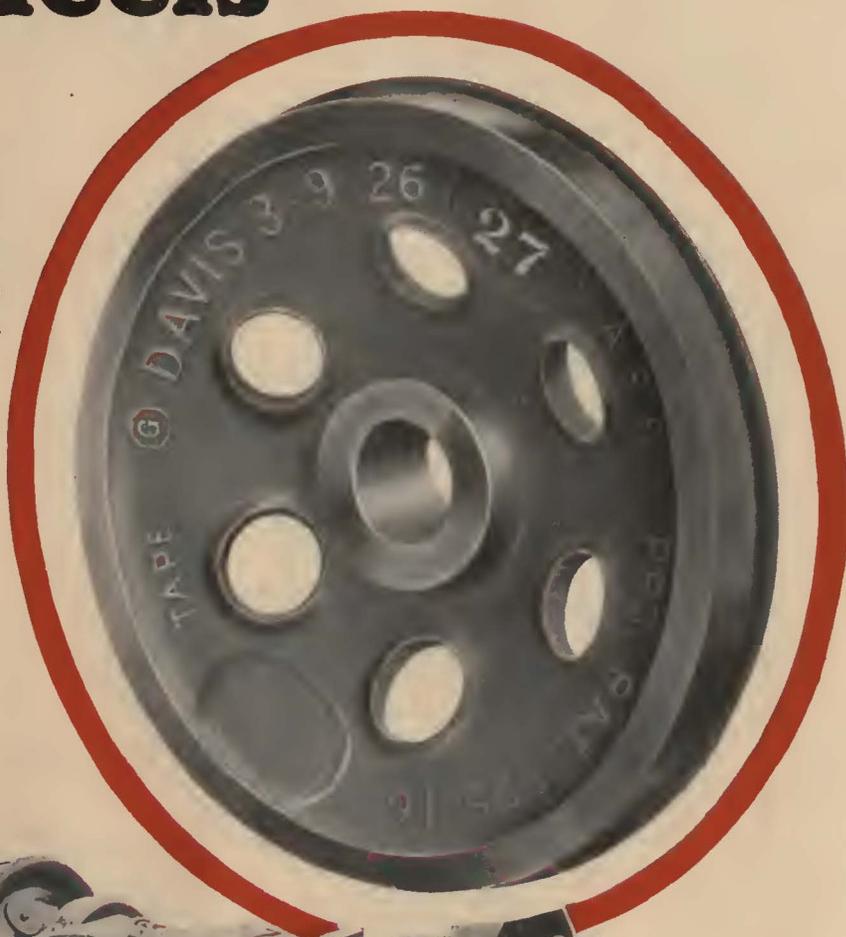
ST. LOUIS

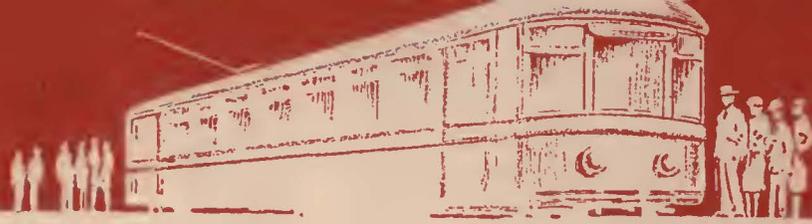




Steel Wheels

**The Davis "One-Wear"
Steel Wheel is a high
manganese composition
wheel, heat treated to
offer maximum resist-
ance to wear.**





The "Safety" Car cannot be moved or the brakes released until the doors are closed, neither can the doors be opened until the brakes are applied.

If the operator releases the controller handle due to carelessness or disability, the power is shut off, the track sanded, an emergency brake application made and the doors unlatched ready for exit of passengers.

Every one of the new Grand Rapids cars will be a "Safety" car

Every one of them is fully equipped with Safety Car Control Devices,—simple in operation, yet assuring positive control and constant efficiency. For experience has shown in Grand Rapids as elsewhere that car safety is a fundamental and powerful factor in building up that public confidence and goodwill essential to successful operation under modern conditions.

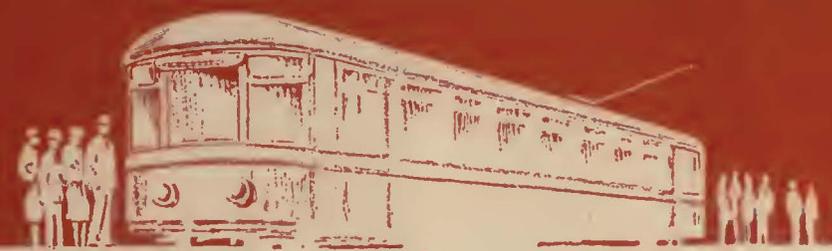


SAFETY CAR DEVICES CO.
OF ST. LOUIS, MO.

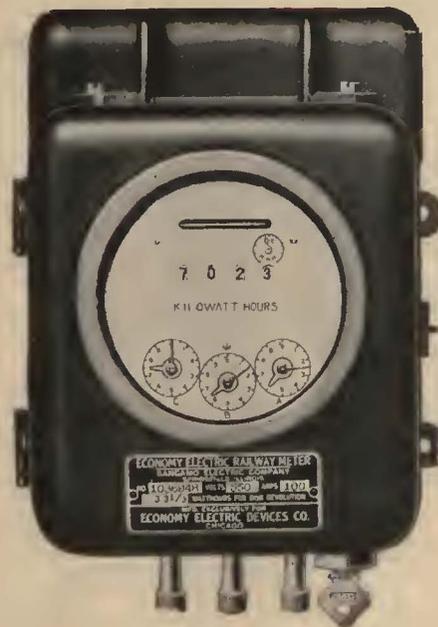
Postal and Telegraphic Address:
WILMERDING, PA.

CHICAGO SAN FRANCISCO NEW YORK WASHINGTON PITTSBURGH

*It is a safety car if equipped with our standard
Safety Car Control Devices*



Economy Meters



on new Grand Rapids cars will assure maximum possible savings

Records kept of the operation of the Grand Rapids original experimental cars showed an energy consumption of 1.82 kw.-hrs. per car mile, as compared with 2.65 on the entire system, or 32% reduction.

Grand Rapids expects the 27 new cars to help pay for themselves by this large reduction in power. Grand Rapids intends to run every one of them, all the time, with the least possible expenditure of power. Grand Rapids desires every operator to do his part.

To that end, ECONOMY METERS are being installed on all these cars, so that actual performance can be checked. Failure to operate efficiently will be made apparent at once, and the cause, whether human, mechanical or electrical, can be corrected. New Modern cars can save energy—ECONOMY METERS make sure of it!

All the Grand Rapids Cars, new and old, have ECONOMY METERS.

Economy Electric Devices Company
37 W. Van Buren St., Chicago

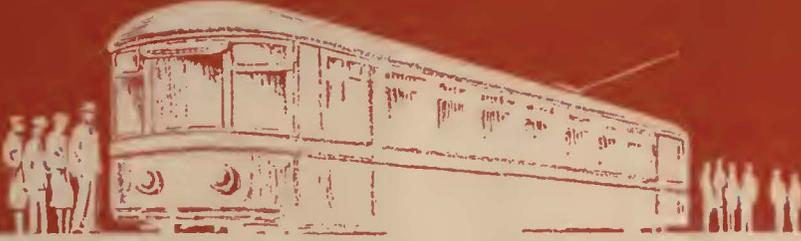
Distributors or Agents for

Sangamo Economy Meters
Peter Smith Heaters

Woods Fare Boxes
Bemis Boyerized Truck Specialties



Two Headlights



for a single end car!



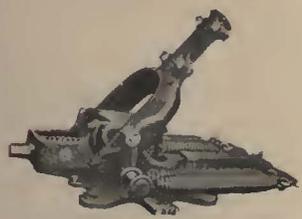
O-B HEADLIGHTS

Type WDB "Imperial" headlights are used. Furnished with McKee lens.



O-B TROLLEY CATCHER

The standard trolley catcher for city service. Has "anti-step-up" feature



O-B FORM 1 TROLLEY BASE

Combines light weight and construction features that insure uniformly a satisfactory operation.

THAT'S a unique idea, isn't it? Yet it's a perfectly logical one, intended to put the street car on an even footing with the automobile, both as to appearance and as to safety.

But when it came to the choice of equipment—time-tried standards prevailed, and O-B "Imperial" Headlights were the choice.

Trolley Base and Trolley Catchers too, are standard O-B types.

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



115 C

Ohio Brass Co.

PORCELAIN INSULATORS LINE MATERIALS RAIL BONDS CAR EQUIPMENT MINING MATERIALS VALVES

In Grand Rapids

YOU SEE THIS PAINT ON ALL STREET CARS

For the past two years all the Street Cars of Grand Rapids have been painted with

Johnston's Krakno Enamel System



Striking vivid color combinations that you see today on the new cars were planned and worked out in detail by Louis J. De Lamar, assisted by other officials of The Grand Rapids Railway Co., working with Leon L. Wolf, Railway Sales Manager.

When you see driving rain or burning sun streaming down upon the Roofs of the Street Cars, just remember that they are capably protected by

JOHNSTON'S ROOF ENAMEL

Manufactured by

The R. F. Johnston Paint Co.

Pearl and Main Streets

Cincinnati, Ohio



Keystone

is written on another record!



➤ **Hunter-Keystone Signs**

➤ **Faraday Car Signals**

➤ **Keystone Rotary Gongs**

The experiments carried on by the Grand Rapids Railway proved conclusively that improved appearance and increased comfort were all-important factors in inducing the public to ride more.

It is therefore significant that these new cars will use Hunter-Keystone Signs and Faraday Car Signals to attract increased patronage—which means increased revenue—and Keystone Rotary Gongs to make operation safer by means of the distinctive warning which they produce, to compete with modern street noises.

Let us tell you how other progressive electric railways are using Keystone Car Equipment to sell their service to the public.

Hunter-Keystone Destination Signs fit practically any space available on a car. See Catalog No. 7 for various types.

Faraday Car Signal Systems are made for every requirement. See Catalog No. 7 for different types and sizes.

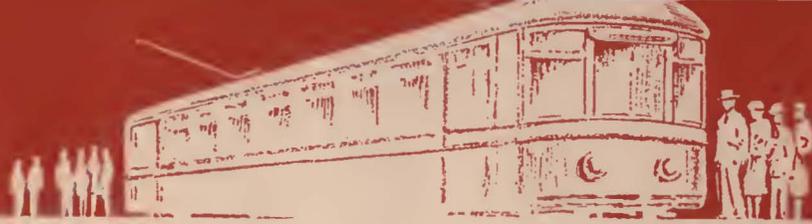
Keystone Rotary Gongs provide an effective alarm bell even on the noisiest streets. See Catalog No. 7 for full particulars.



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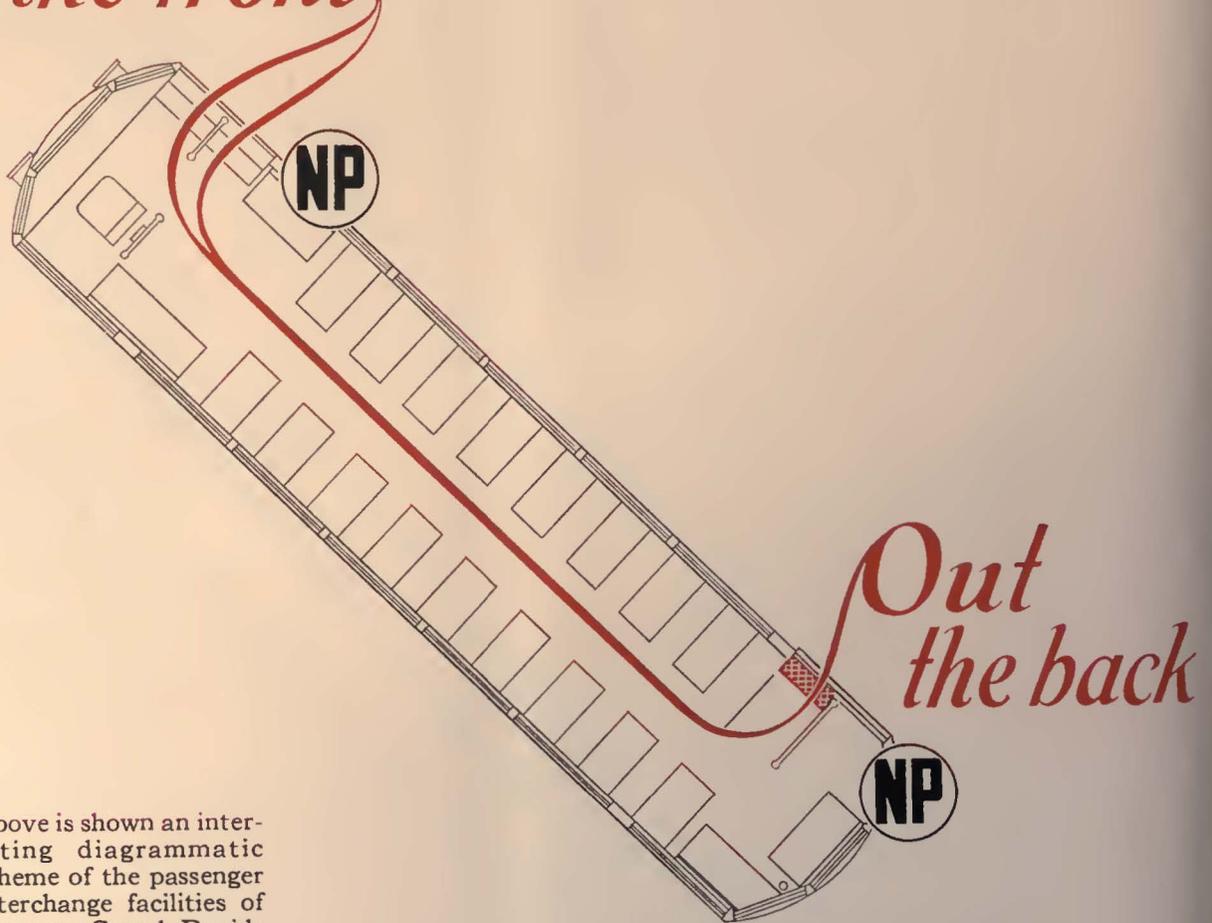
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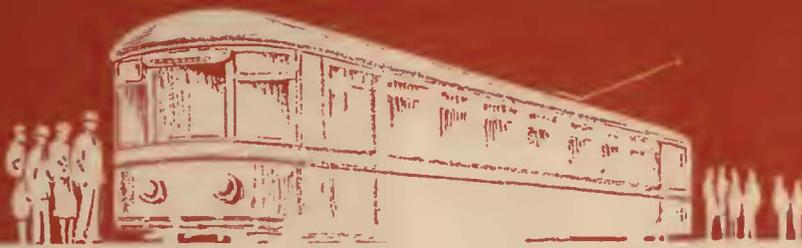


Grand Rapids speeds up!

In the front



Above is shown an interesting diagrammatic scheme of the passenger interchange facilities of the new Grand Rapids cars. National Pneumatic Equipment at front and rear doors is included, of course.



and Specifies the **Treadle**



BOTH front and rear doors of the new Grand Rapids cars are operated by National Pneumatic Equipment.

The door is opened by the weight of a passenger on the treadle. The safety interlock, however, prevents this opening of the doors until the car has come to a dead stop.

When the last passenger is off the step, the door closes and a light flashes before the operator, in front. The same safety interlock prevents the car from starting before the doors are tightly closed and the signal light has flashed.

NATIONAL PNEUMATIC COMPANY

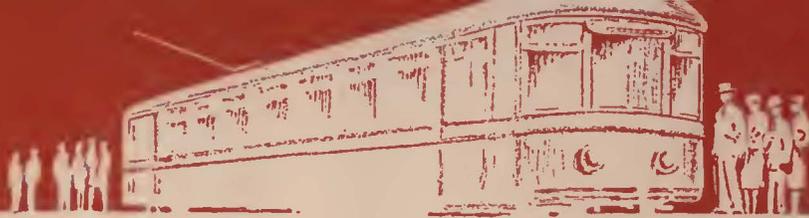
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Railway & Power Engineering Corp., Ltd.

PHILADELPHIA
1010 Colonial Trust Building



Grand Rapids Rides On and Under

KEMI-SUEDE

When the Grand Rapids Railway ordered 27 new cars they specified KEMI-SUEDE for roofing and half seat-covers and also for some curtains.

And Kemi-Suede is holding up wonderfully well under the all-weather strain that roofing gets . . . and the heavy-duty friction inflicted upon seat covers.



**Write
today
for
samples.**

Kemi-Suede is waterproof, easily cleaned with soap and water. Its "pressed through" construction makes it a "bear for wear."

Kemi-Suede won't check, crack, or peel . . . is unaffected by heat or cold, comes in several weights and many attractive shades.

Kemi-Suede is always reliable, always brutally strong and long-wearing—always specified when the BEST roofing, seat covers, flooring and curtain material is desired.

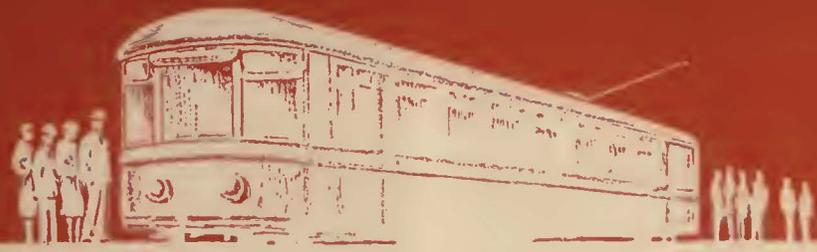
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WATERPROOF FABRIC Co.

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Dept. D

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Distributors Everywhere.



Grand Rapids joins the rapidly growing list of users of **SKF** equipped journals



As an indication of the increasing recognition of roller bearings in this field, it is significant that several of the Grand Rapids Railway's newest cars have journals equipped with **SKF** Spherical Bearings.

To eliminate journal wear, collar wear, hot boxes, and waste of oil and packing, install these rugged, dependable units—**SKF** Journal Bearings.

Send for our Special Certified Survey to get full particulars.

SKF INDUSTRIES INC., 165 Broadway, New York City

More than 100 Factory Offices Throughout the World

SKF
Puts the Right Bearing in the Right Place

Ball Bearings **Roller Bearings**



Add another to the list
of prominent users of

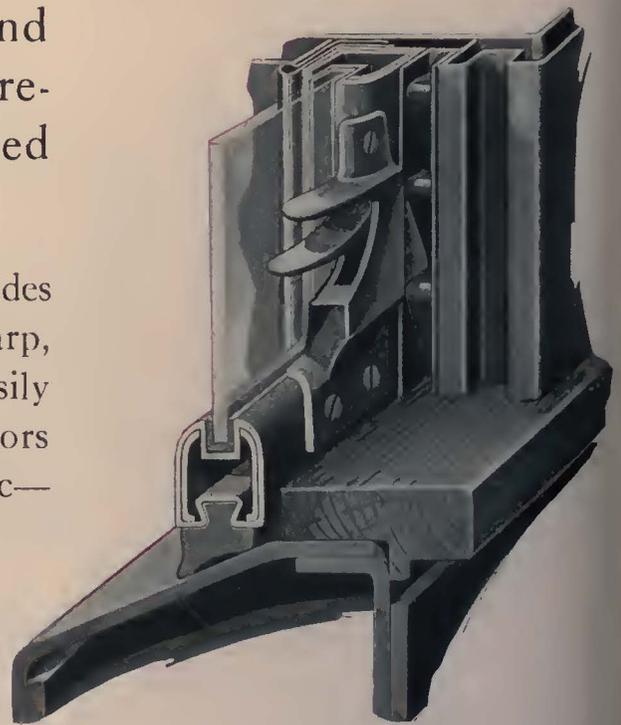
Rex Sash
and weatherstrip—



Comfort, appearance and safety are written large in the requirements of all the equipment for the Grand Rapids Railway's new cars. It is therefore significant that they specified Rex Equipment.

Being all metal, Rex Sash is fireproof, provides greater light area, and does not swell, warp, crack or need repainting. Windows can be easily raised and lowered at all times. Such factors build up the goodwill of the riding public—which results in increased revenue.

Write for particulars of Rex Equipment and information about other prominent users and what it has accomplished for them.



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ELKHART, IND.

Suite 1132, Marquette Building,
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NEW YORK, N. Y.

PACIFIC COAST PLANT: 801 Lyon Street, LOS ANGELES, CALIF.



Again **HASKELITE** and **PLYMETL** have been chosen by a leading car operator *for light-weight engineering*

Light weight is to be a salient feature of the fine new equipment under construction for the Grand Rapids lines. Of all materials, HASKELITE, the engineering plywood, and PLYMETL, its steel-armored partner, have most consistently demonstrated their su-

periority in light weight and strength both in the building of new cars and the rehabilitation of old ones. It is natural, therefore, that the specifications for these cars should have read: "HASKELITE roofs and interior linings; PLYMETL for side panels."

The actual saving in weight by the adoption of these materials was as follows:

	Replacing	Sq. Ft.	Saving Lbs.
Interior side lining— $\frac{1}{8}$ -in. 3-ply Haskelite.....	$\frac{1}{8}$ -in. cherry.....	46.2	34
Roofs— $\frac{1}{4}$ -in. 3-ply poplar Haskelite.....	$\frac{3}{8}$ -in. poplar T. & G.....	238	100
Side panels— $\frac{1}{4}$ -in. 4-ply VE Plymetl.....	No. 12 B. & S. gauge steel.....	149	435
			<u>569</u>

@ 6c. lb. annual saving per car \$34.14

A list of present users, copies of letters from railway men and a blueprint booklet showing detailed application of HASKELITE and PLYMETL, will be sent gladly upon request.

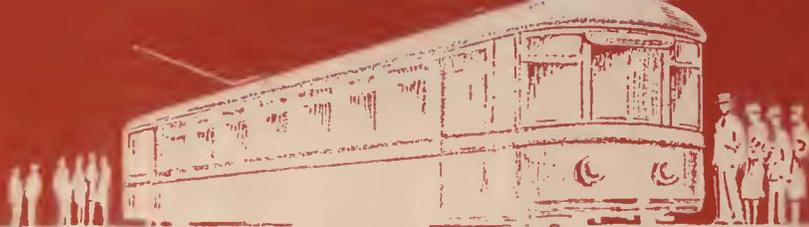
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133 W. Washington Street, CHICAGO, ILLINOIS



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For roofs, floors, linings, etc. Light, strong, stiff, easy to apply and to repair. Can be bent to any reasonable radius.

For side panels, etc. Lighter than steel, greater strength, and greater resistance to impact and buckling. Makes a quiet well-insulated car.



EAGLE-OTTAWA *"Good Leather"*

Nothing can be closer to the subject of comfort than the seats on which passengers attempt to find relaxation during the street car ride.

Grand Rapids indeed has set a pace in passenger comfort by the use of up-to-date, stylish, double chair type seats—all leather-upholstered with Eagle-Ottawa Colonial Grain Leather.

This product meets the Grand Rapids requirements—attractiveness, ease of cleaning, durability and economy.

Eagle-Ottawa Leather has proved its worth in hundreds of cars and buses. As a seat upholstery material, it is unsurpassed.

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*The Worlds Largest Producers
of Fine Upholstery Leather !*



Grand Rapids Specifies More-Jones No. 25 Trolley Wheels

In keeping with their idea for strict modernity, Grand Rapids made More-Jones No. 25 Trolley Wheels their choice. A certain few facts about design, materials and construction of this No. 25 Trolley Wheel, plus an outstanding service record, gave Grand Rapids every reason for making their decision.

Here are some of the reasons why—The metal used is exceedingly tough, an alloy of purest new metal, insuring maximum conductivity yet does not grind away the metal of the wire. Perfect lubrication is accomplished automatically. Properly balanced and mechanically perfect in finish. Greater mileage assured. Lowest in ultimate cost and highest in net efficiency.

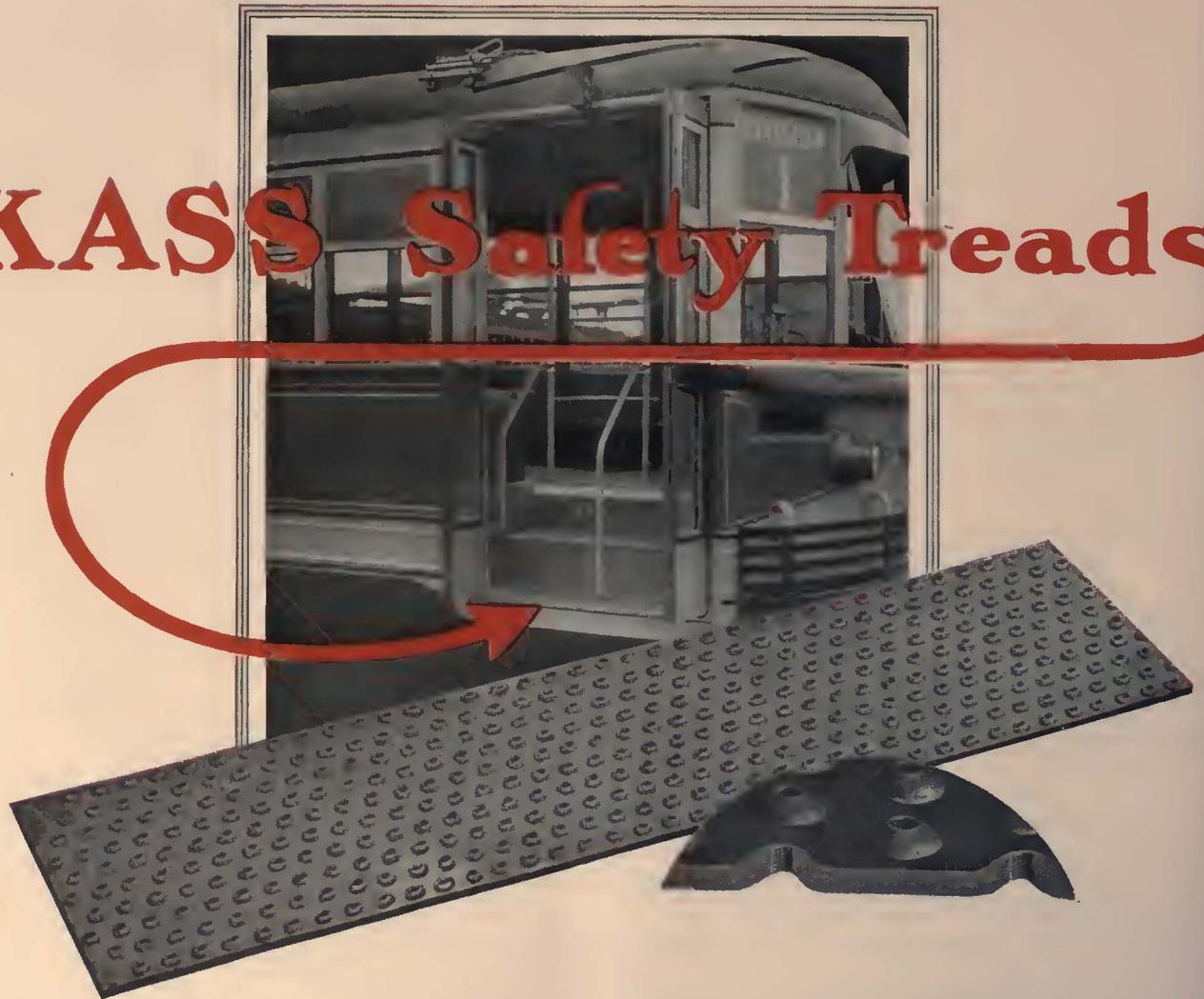
Ask about More-Jones Armature Babbitt Metal scientifically compounded for the railway field exclusively and our Tiger Bronze Axle and Armature Bearings which insure maximum service under hardest operating conditions.



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Again specified for MODERN Cars

All over the country modern cars,—safe, ride-promoting, profit-earning cars,—are being equipped with Kass Safety Treads. Now comes Grand Rapids with an order for rolling stock which will set a new pace in car design,—and here again the specifications call for Kass Safety Treads.

The reason is simple and specific. Kass Safety Treads have *proved* lightest in weight, highest in non-skid efficiency, and lowest in initial and upkeep costs.

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MORTON MANUFACTURING CO.
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Provide all year 'round comfort with Utility Car Heating Apparatus

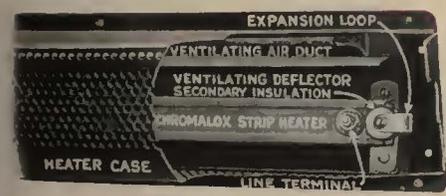


Utility New Type Heat Regulator No. 9 provides greater uniformity of temperature and comfort with 50% saving in current.

Included in Underwriters' Laboratories List of Inspected Electrical Appliances.

UTILITY CAR HEATING AND HEAT REGULATING EQUIPMENT was installed in the 27 Grand Rapids cars after extensive comparative tests with other competitive devices.

To provide proper heat at all times for the comfort of passengers, the Grand Rapids Railway installed Utility Truss Plank and Vestibule Heaters and Type No. 9 Heat Regulators.



Truss Plank Heater showing "Chromalox" Strip in place, with ventilating air duct and ventilating deflector which keep the back of the heater cool and throw all the heat units out into the car instead of dissipating a lot of energy through the wall or side of the car.

For more complete information about Utility Car Heating, Ventilating, and Heat Regulating Devices get our catalog and quotations.

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Tested—and accepted!

Snow Scraper Equipment

ONE year ago we announced the use of Root Spring Scrapers on the Grand Rapids model car then featured in this paper. Today we are pleased to announce Root Spring Scrapers on all 27 new cars ordered by Grand Rapids.

Recognition of our equipment by the Grand Rapids Railway is particularly gratifying in view of the extensive tests and investigations made by that Company before specifying.

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Kalamazoo, Mich.



Root Spring Scrapers are operated pneumatically. The motorman applies them instantly from his post at the controller. Root Spring Scrapers efficiently remove snow or slush, whether hard or soft, packed or loose.

Root Spring Scrapers will be found invaluable in maintaining service and schedules under adverse weather conditions.



ROOT

Spring Snow Scraper



Again!



—the most modern cars
use the ever-reliable

PEACOCK STAFFLESS

THESE Grand Rapids cars are considered the last word in up-to-date car design and equipment.

That they use the ever-reliable, time-tested Peacock Staffless Brakes is surely significant evidence that proved performance and modern design are well combined in Peacock Staffless Brakes.

Almost unlimited chain-winding capacity, high-braking power, light-weight and space-saving dimensions adapt these brakes to every type of car.

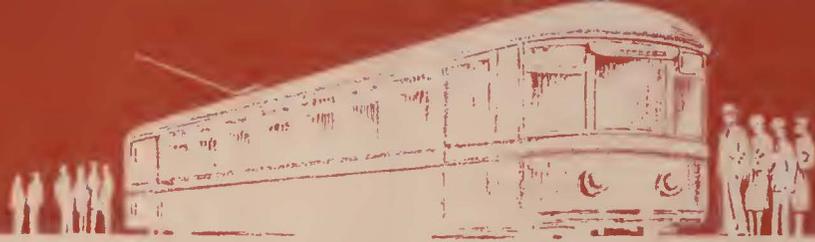
Installation estimates on request.

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AUTOMOBILE competition has altered conditions. Consequently a changed viewpoint with regard to car design is rapidly taking place. Since "ride merchandising" is a comparatively new term in the electric railway vocabulary it is not surprising that this element in car design has only recently begun to command general attention. There seems to be no fundamental reason why the street car cannot be made as attractive to the eye as can an automotive vehicle operating on the highway and carrying its own power plant.

The editorial below from the Sept. 26, 1925, issue of Electric Railway Journal seems particularly significant in the light of the progress made by Grand Rapids.

The Car Reflects the Standing of the Railway In Its Community

MUCH of the popular idea that the street railways are destined for the scrap heap is attributable to the appearance of some of the cars now in service. Such cars create the impression of an obsolete industry. The public does not see conditions in the shops or substations, but the cars are constantly on parade. While this is not a universal condition by any means, it is true of many cities. A long series of circumstances, many beyond the control of the railway, has sometimes interfered with the purchase of new cars. Too frequently, however, the railway management itself has been responsible for the operation of obsolete rolling stock. It has tried to get the very last possible day's work out of each car before scrapping it.

Preservation of the standing of the railway in its community makes it imperative that old

cars be replaced by those of modern design, entirely aside from considerations of efficiency and operating cost. Money spent for remodeling cars that have been in service for fifteen or twenty years is often worse than wasted because it merely postpones the day when up-to-date equipment can be purchased. Modern cars are needed to meet modern conditions. The car designer holds the key to public approval and increased patronage. Attention to the details of lines and appearance will produce a general improvement in car architecture. Application of the same principles that lead a merchant to give careful thought to the appearance of his store front will inevitably attract more riders and make more friends for the electric railways.

It is obvious that the most expensive car to operate is the one that attracts no patronage.



One hundred and twenty five of these cars furnished the Department of Street Railways, City of Detroit.

Build New Business *with New Cars*

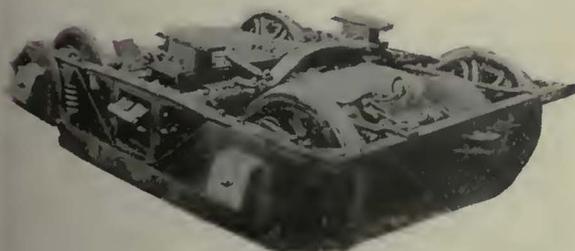
It is an established fact in many cities that new and modern cars create new business. New cars can do the same on your property. Increased revenue coupled with decreased maintenance and operating expense are two factors in the replacing of obsolete cars with modern Cummings Cars.

Our engineers are thoroughly conversant with modern features of car design and construction. Let them cooperate with you in the planning and building of new equipment, or allow them to quote on your requirements.

CUMMINGS CAR AND COACH COMPANY

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MC62 Low Car Body Truck

LIGHT WEIGHT CITY
AND INTERURBAN CARS

LIGHT WEIGHT SINGLE AND
DOUBLE TRUCKS

GAS-ELECTRIC MOTOR COACHES



Make the railway a source of civic pride



Read through the average chamber of commerce booklet. Even office buildings come in for proud mention. And if the average citizen can feel a glow of civic pride for office buildings, why not for his electric railway system, a service which fundamentally concerns the growth and prosperity of his community?

can be done
 with *handsome cars*

The street car has pride of place on the thoroughfares of the community it serves. More often than not it is a dominant feature of the city scene.

Why then should it not be the most handsome feature too—a source of pride to the citizens and the company, a constant breeder of goodwill and an incentive to greater use of railway facilities?

It can be, and it is in many progressive cities today. For these electric railway companies have stopped losing time, money and goodwill on obsolete equipment. They have replaced rolling stock of a past generation with

speedy and impressively handsome modern cars, smooth and silent in operation, streamlined, and furnished for passenger comfort.

And what has been the result? Systems which previously came in for little else but criticism from their patrons are now popular—a source of civic pride. Earnings have jumped, and the new, efficient equipment has naturally proved economical in operation.

Furthermore, employees have caught something of the spirit, a sound foundation of good modern service has been laid, which can more easily withstand the onslaughts of competition.

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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?

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It is too expensive to have your literature go wrong. In fact the directory pays for itself many times over the first campaign.

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10% off for five or more.

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- 1—Complete list of every recorded electric railway company in the United States, Canada, Mexico, and the West Indies.
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- 7—Rates of fare.
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.....More complete information con-
cerning contents.

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Street

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Southern cities sell transportation on a modern basis

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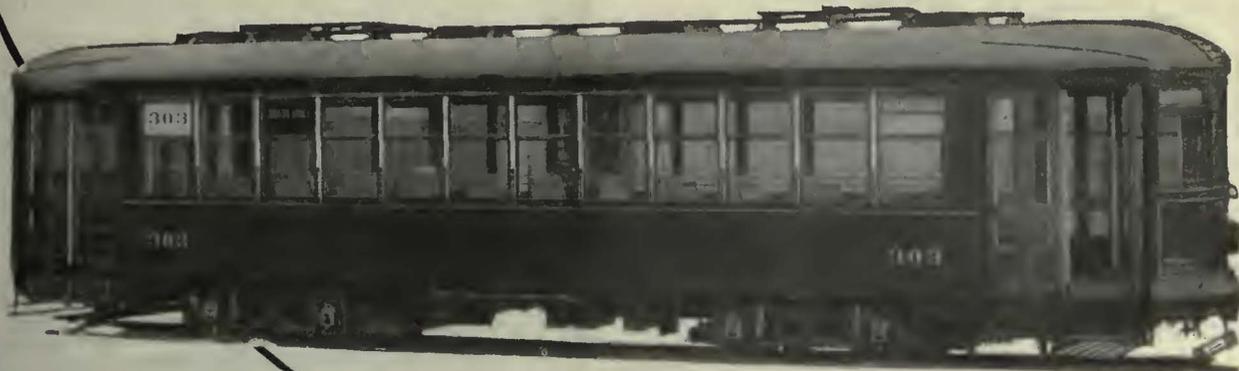
"THOMAS BUILT" CARS

To read even this *partial* list of users of new Thomas Cars is to realize that southern cities are turning to the modern electric railway car as the means of carrying more revenue passengers at a lower cost per passenger. This is the recognized basis of building net revenue and thus paying reasonable dividends to stockholders.

The modern car movement is definitely under way! It is meeting the challenge of automobile competition and meeting it successfully. It is proving that the operation of obsolete cars is now an economic waste.

The modern car will pay its own way—let us demonstrate with figures!

PERLEY A. THOMAS CAR WORKS
High Point, N. C.



Gears and Pinions
 ✓ "Nuttall" is the specification here



R.D. NUTTALL COMPANY
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1926

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Make use of the other man's experience

That old saying

about experience being the best teacher is absolutely sound in one sense. But most of us recite it without thinking that experience may be of various sorts—the experience of other men as well as our own, "canned experience." If you please, ready for use. Just open and serve yourself! Why not take advantage of the experience of other men as far as we can and save not only years of time but many expensive lessons? Do you know how much of the world's best research in the electric railway field is contained in

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Duluth, Minn.
Minneapolis, Minn.

Pacific Coast Representative:
U. S. Steel Products Co.,
Pacific Coast Dept.

San Francisco, Cal. Portland, Ore.
Los Angeles, Cal. Seattle, Wash.

Export Representative: United States Steel Products Co., 30 Church Street, New York.

75% use "Tool Steel" gears.

IN 1925 Electric Traction awarded a Speed Trophy Cup in a contest of 30 companies. The Winner—Galveston-Houston Electric Company made their record on "Tool Steel" gears and pinions, installed in 1914 and still running after 698,266 miles.

Of the 30 companies contesting, 75% were users of "Tool Steel" gears and pinions.

The Tool Steel Gear & Pinion Co.,
Cincinnati, Ohio



WHARTON

TRACKWORK

Switches, Mates, Frogs
Complete layouts of all kinds
Made by the originators of
Manganese Trackwork
Wm. Wharton Jr. & Co., Inc.
Easton, Pa.

Est. LUDLUM 1854

MOHAWK EXTRA

THE MASTER TOOL STEEL FOR PRESS TOOLS COMPLICATED SHAPES TAPS AND REAMERS

LUDLUM SPECIAL STEELS LUDLUM STEEL COMPANY

WE HAVE A SPECIAL TOOL STEEL FOR EVERY SPECIFIC PURPOSE

STEELS SPECIAL PURPOSE WATERMET-H. U. S. P.

-Carnegie-

the name to look for on Steel

CARNEGIE STEEL COMPANY
PITTSBURGH - PENNA.

Lorain Special Trackwork Girder Rails

Electrically Welded Joints

THE LORAIN STEEL COMPANY

Johnstown, Pa.

Sales Offices:

Atlanta Philadelphia Chicago Pittsburg Cleveland Dallas New York

Pacific Coast Representatives:
United States Steel Products Company
Los Angeles Portland San Francisco Seattle

Export Representative:
United States Steel Products Company, New York, N. Y.



This fleet of 12 Studebaker Busses, all of the 20-Passenger Parlor Car De Luxe-type, was recently purchased by The Columbus-Springfield Bus Company—as the result of previous experience with Studebakers.

Studebaker Bus Operators Buy More Studebakers

When they need additional equipment

—because experience proves the higher economy of Studebaker Busses

THE Columbus-Springfield Bus Company, operating between Columbus, London and Springfield, Ohio, purchased the twelve Studebaker Parlor Cars shown above—because of previous experience with Studebaker Busses.

The partners in this company were previously independent operators running Studebaker passenger cars and busses on Studebaker passenger-car chassis. When the company was formed, they discarded their old equipment and ambitiously purchased a fleet of large-capacity units—each more than double the price of the Studebaker and almost twice as heavy. Result: the company suffered a loss, every month getting deeper and deeper in the red.

Recently the company was reorganized. And at once the heavy, large-capacity units were replaced by medium-capacity Studebaker Parlor Cars. Experience with both types of equipment was the reason.

As the list below shows, there are scores of operators who have similarly made repeat purchases of Studebaker equipment, having proved by experience that Stude-

baker Busses are more economical to operate and earn higher profits. Many use Studebakers exclusively.

Due to standardization of design and large-scale production, the first cost of the medium-capacity Studebaker Bus, complete with body, is about one-half the cost of the large-capacity bus. Operating expense is less because it is 50% lower in weight than the average heavy truck-type bus. As proved by hundreds of Studebaker Busses with records of over 100,000 miles, it gives scores of thousands of miles of thoroughly dependable service, thereby greatly reducing depreciation.

Obviously, the Studebaker operator enjoys a preferred position. For, with the price of a Studebaker Bus practically half that of a big bus—and with the low operating cost per bus mile—he is able to double the frequency of the schedule with the same total investment and the same total cost of operation.

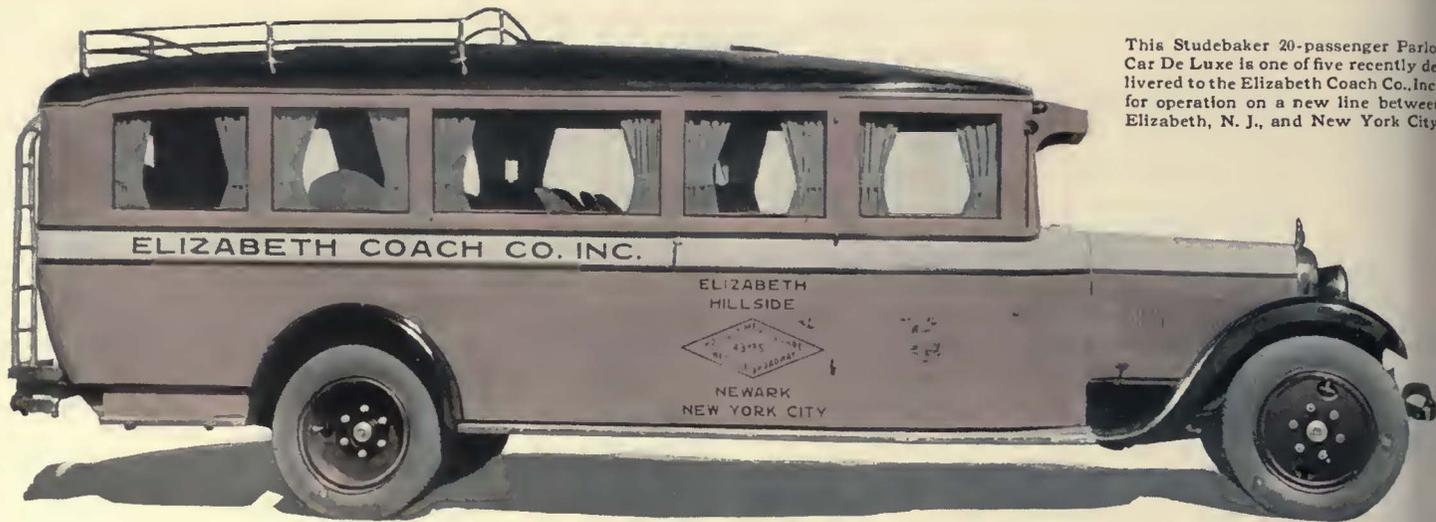
More than 1000 operators are using Studebaker Busses—convinced by actual cost records that they insure “more profit per passenger mile.”

L
—first cost
—depreciation cost
—maintenance cost
—operating cost
Lower

Partial List of Operators Who Have Made Repeat Purchases of Studebaker Busses

- | | | | |
|--|--|---|---|
| H. & H. Bus Line, Tuscumbia, Ala. | Red Star Trans. Co., Cambridge, O. | Flint-Ann Arbor Motor Coach Line, Ann Arbor, Mich. | E. A. White, Inc., New York City, N. Y. |
| Blsbee-Tucson Stage, Tucson, Ariz. | Wabash Valley Trans. Co., Marshall, Ill. | Columbus & Zanesville Transp. Co., Zanesville, Ohio | Gray Line Bus System, Inc., Mt. Kisco, N. Y. |
| Star Auto Stage, Tucson, Ariz. | I. U. Bus Lines, W. O. Springer & Son, Greenwood, Ind. | Ohio Transit Co., Columbus, Ohio | Palace Coach Lines, Inc., New York City, N. Y. |
| Interstate Trans. Co., San Francisco, Cal. | Interstate Mtr. Trans. Co., Chillicothe, Ohio | Interstate Transit Co., Portsmouth, Ohio | Hudson Valley Coach Co., Newburgh, N. Y. |
| Hallbrook & Shuler, Bell, Cal. | Jahns Bus Co., Laporte, Ind. | C. & Z. Tracton Co., Columbus, O. | The Ward-Way, Inc., Muskogee, Okla. |
| Arrowhead Line, Los Angeles, Cal. | King Bros., Richmond, Ind. | Dexter Transfer Co., Dexter, Mo. | Penn. Yan-Geneva Bus Line, Penn. Yan, N. Y. |
| Mercantile Trust Co., San Francisco, Cal. | Southern Kansas Stage Lines, Wichita, Ksns. | Mr. Tom H. Scofield, Charleston, Mo. | Boat Transfer Co., Newton, N. C. |
| Scloto Valley Bus Co., Chillicothe, Ohio | Blue Coach Line, Erlanger, Ky. | Midwest Transit Co., St. Louis, Mo. | Cress & Lowder, Concord, N. C. |
| Yelloway, Inc., Denver, Colo. | Dixie Tracton Co., Erlanger, Ky. | Mr. H. A. Chase, Missoula, Mont. | Washington Transp. Co., Washington, Pa. |
| Danbury-Waterbury Bus Line, Danbury, Conn. | Burnea Bros., Lexington, Ky. | Gardnerville Stage Co., Gardnerville, Nev. | White Star Bus Co., Albemarle, N. C. |
| Bridgeport & Waterbury Pass. Service, Waterbury, Conn. | Red Star Trans. Co., Lexington, Ky. | Dewey Transit Co., Reno, Nev. | Denny & Walters, Charlotte, N. C. |
| Motor Travel Bureau, Inc., Denver, Colo. | Thorohred Transit Co., Lexington, Ky. | Mr. H. McCloakey, Beverly, N. J. | Eastern Carolinas Coach Co., Charlotte, N. C. |
| Annoball Trans. Co., Portsmouth, Ohio | Stuebenville-Canton Trans. Co., Steubenville, Ohio | I. C. & E. Tracton, Springfield, O. | B. & H. Coach Line, Inc., Newton, N. C. |
| West Flagler Terminal Lines, Miami, Fla. | Motor Transit Co., Shreveport, La. | Elizabeth Coach Co., Inc., Elizabeth, N. J. | Blueridge Trall, Asheville, N. C. |
| Plymouth Corp., Orlando, Fla. | Tri-State Transit Co., Shreveport, La. | Sunset Trail Bus Co., Inc., Jersey City, N. J. | Inter Carolinas Motor Bus Co., Asheville, N. C. |
| Interstate Realty Co., Tampa, Fla. | White Line Bus Co., Lewiston, Me. | New Jersey Motor Coach Co., Westwood, N. J. | |
| Vanacker & Knapp, Miami, Fla. | Bine Line Bus Co., Lewiston, Me. | H. & K. Truck Lines, Las Cruces, N. Mex. | |
| | Old Trails Bus Line, Frostburg, Md. | | |

STUDEBAKER BUS CHASSIS



This Studebaker 20-passenger Parlor Car De Luxe is one of five recently delivered to the Elizabeth Coach Co., Inc., for operation on a new line between Elizabeth, N. J., and New York City

Unexcelled Luxury and Design at Unequaled Low Price

— New Studebaker 20-Passenger Parlor Car matches the highest-priced busses in design, comfort and dependability — mounted on the most powerful bus chassis of its size in the world

BUS operators have enthusiastically received the new Studebaker Parlor Car De Luxe. *First*, because of its beautiful design and luxurious comfort. *Second*, because it combines remarkably low first cost—\$6125—with low operating cost.

Ultra-smart appearance

In appearance and luxury of riding comfort, it can be compared only with the large parlor car busses selling at from \$10,000 to \$12,000.

Note the low-hung body with its graceful tapering roof. Length over all, 283¾ inches. Framework is of selected hardwood. Finish is rich, durable lacquer.

Entrance door (32 inches wide) is on the forward right-hand side. Controlled by hidden mechanism, which is operated by a small hand lever at the left of the driver's seat. Separate door for driver. Emergency door at left rear.

Luxurious, roomy interior

Every interior feature is painstakingly planned to give utmost physical and mental relaxation to passengers. Individual armchairs, upholstered in genuine leather, with cane sides. Liberal leg room (30 inches) and head room (61 inches). Broad center aisle. Accommodation for 20 passengers, including driver.

Comfort is enhanced by such details as wide, easily adjustable windows with boquet draperies; mohair head lining and

side lining; dome lights; window-post mirrors; an exhaust heating system. Six ventilators are provided—one in the cowl, two over the windshield, and three in the roof—insuring continuous circulation of air without draught. There is a railed-in baggage compartment at the driver's right, and additional accommodation for luggage on the roof.

Most powerful bus chassis of its size and weight

Mounted on specially designed Studebaker bus chassis, this bus is ideal for intercity and suburban service. It has the speed, stamina and dependability to answer the severest demands of service.

According to the rating of the Society of Automotive Engineers, it is the most powerful bus chassis of its size in the

world. There are 36 bus chassis on the market with less rated power and more weight.

The chassis is sturdily built, with surplus strength. It is not a truck chassis—nor a passenger-car chassis which has been lengthened and, therefore, weakened by splicing. Extra safety factors are included in its design. Rear axle shaft is extra large; propeller shaft is oversize for extra strength. Springs are extra sturdy and resilient. Four-wheel hydraulic brakes are supplemented by a service brake on the rear wheels and an emergency brake on the driveshaft.

Unusually complete equipment

Equipment is complete, including stop signal system; illuminated destination sign box (above windshield); automatic windshield cleaner; rear-view mirror; front and rear bumpers; motometer; extra wheel with tire, tube and carrier, mounted on left front fender; 8-day clock and gasoline gauge, plus the usual instruments, mounted in an oval group under glass; inspection lamp with 10-foot cord. Lights are controlled by a steering-wheel switch.

Due to standardized design and large-scale production, the new Studebaker Parlor Car De Luxe is offered at a remarkably low price. Operators find that its smart appearance and luxurious riding comfort attract continuous patronage, while its very low initial and operating costs insure much higher profit per passenger mile.

\$6150

f. o. b. factory

Including dual rear wheels. Purchase can be arranged on a liberal Budget Payment Plan—a conservative down payment and balance in convenient monthly installments.

NOW FREE:

Mail coupon at right and obtain free a copy of our unique booklet, "Profitable Bus Operation." It contains facts and figures of vital interest to every bus owner.

THE STUDEBAKER CORPORATION OF AMERICA
Dept. B South Bend, Ind.

Send me free "Profitable Bus Operation" without obligation.

Name

Address

City State

How many busses have you at present?
Check below the Studebaker Bus about which you desire information.

Type: Sedan.....Parlor Car.....Street-Car Type.....

Capacity:.....Passengers

Five Body Designs, 12 to 21 Passengers, \$3935 to \$6150

Prices f. o. b. factory, covering body and chassis, complete

Purchase can be arranged on a liberal Budget Payment Plan—small down payment and balance in convenient monthly installments

12-Pass. (including driver) cross-seat Sedan-Type \$3935

15-Pass. (including driver) cross-seat Sedan-Type \$4295

19-Pass. (including driver) cross-seat Sedan-Type \$5050

20-Pass. (including driver) Parlor-Car De Luxe* . . . \$6150

21-Pass. Pay-As-You-Enter Street-Car Type* . . . \$5125

*Includes dual rear wheels

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



WORKS
Bayonne, N. J.
Barberton, Ohio

BRANCH OFFICES

BOSTON, 49 Federal Street
PHILADELPHIA, Packard Building
PITTSBURGH, Farmers Deposit Bank Building
CLEVELAND, Guardian Building
CHICAGO, Marquette Building
CINCINNATI, Traction Building
ATLANTA, Candler Building
PHOENIX, ARIZ., Heard Building
DALLAS, TEX., 2001 Magnolia Building
HONOLULU, H. T., Castle & Cooke Building
PORTLAND, ORE., 805 Gasco Building

BRANCH OFFICES

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 Aguilar 104
SAN JUAN, Porto Rico, Royal Bank Building

The DIFFERENTIAL CAR



Standard on
60 Railways for

Track Maintenance
Track Construction
Ash Disposal
Coal Hauling
Concrete Materials
Waste Handling
Excavated Materials
Hauling Cross Ties
Snow Disposal

Use These Labor Savers

Differential Crane Car
Clark Concrete Breaker
Differential Bottom Dump Ballast Car
Differential Car Wheel Truck and Tractor

THE DIFFERENTIAL STEEL CAR CO., Findlay, O.

B. A. HEGEMAN, Jr., President H. A. HEGEMAN, First Vice-Pres. and Treas.
F. T. SARGENT, Secretary W. C. PETERS, Vice-Pres. Sales and Engineering

National Railway Appliance Co.

Grand Central Terminal, 452 Lexington Ave., Cor. 45th St., New York.

BRANCH OFFICES

Munsey Building, Washington, D. C. 100 Boylston Street, Boston, Mass.
Hegeman-Castle Corporation, Railway Exchange Building, Chicago, Ill.
Tool Steel Gears and Pinions Fort Pitt Spring and Mfg. Co.,
Anglo-American Varnish Co. Springa
Varnishes, Enamels, Etc. Cutler Hammer Electric Heaters
National Hand Holds Flaxlinum Insulation
Genesco Paint Oils Anderson Slack Adjusters
Dunham Hopper Door Device Yellow Coach Mfg. Company—
Garland Ventilators Single and Double-deck Buses
Economy Electric Devices Co. Walter Tractor Snow Plows
Power Saving and Inspection Meters

Hubbard and COMPANY

PITTSBURGH · OAKLAND, CAL · CHICAGO



{ The Hardware makes the line }
Hubbard makes the Hardware

Arc Weld Rail Bonds

AND ALL OTHER TYPES

Descriptive Catalogue Furnished

American Steel & Wire Company

Chicago New York Boston Cleveland Pittsburgh Denver
U. S. Steel Products Co.
San Francisco Los Angeles Portland Seattle



We make a specialty of
**ELECTRIC RAILWAY
LUBRICATION**

We solicit a test of TULC
on your equipment

The Universal Lubricating Co.

Cleveland, Ohio
Chicago Representatives: Jameson-Ross Company,
Straus Bldg.

There are paints and paints,
but—

users have found that there is no other paint
which will take the place of VALDURA
ASPHALT PAINT when conditions are
abnormal.

It, therefore, stands to reason that if
VALDURA proves satisfactory under difficult
conditions, it will give excellent service where
normal paint conditions prevail.

Your inquiry will be promptly and carefully answered.

AMERICAN ASPHALT PAINT CO.
844 Rush Street Chicago

**WE OWN AND OFFER—
FOR SALE
ALL EQUIPMENT OF FORMER**

NEW YORK & LONG ISLAND TRACTION CO.

Birney Cars
Brill Cars
Southern Cars

which includes:
Sweepers
Snow Plows
Work Cars

Electric Welder
Electric Grinder
Concrete Mixer

RAILWAY MOTORS G. E.—58, 80, 202, 800
Westinghouse—56, 307, 508-A
FOR INFORMATION REGARDING THE ABOVE, WRITE OR WIRE

H. E. SALZBERG CO., INC.

Railway Division

50 CHURCH ST.

NEW YORK CITY

POSITIONS WANTED

AUDITOR with eleven years' continuous public utility experience railway, bus, gas and electric departments, desires position where promotion depends on ability. Now employed; can obtain release with reasonable notice. PW-904, Electric Railway Journal, Star Building, St. Louis, Mo.

CO-ORDINATION may mean an addition to your staff as well as to your equipment. Young man, engineering training having six years' experience in both operation and maintenance of buses, desires change. Qualified to take complete charge of bus department or subsidiary. Experienced in traffic, public relations, personnel, and costs. Midwestern location preferred. P.W.-908, Electric Railway Journal, Tenth Ave. at 36th St., New York.

RAILWAY superintendent in charge of operation and maintenance of rolling stock track and overhead, an outstanding success in operating co-ordinated railway and coach service, desires change for personal reasons. Correspondence invited. PW-887, Electric Railway Journal, 7 So. Dearborn St., Chicago, Ill.

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.

SALESMEN WANTED

Car Salesman

Qualified in sales engineering and well acquainted with electric railway industry. Give age, experience in detail, and salary. SW-912, Electric Railway Journal, Tenth Ave. at 36th St., New York.

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.

"SEARCHLIGHT" RATES

Electric Railway Journal

UNDISPLAYED:

Positions Wanted—4 cents a word, minimum charge—75 cents an insertion.

Positions Vacant and other classifications—8 cents a word, minimum charge \$2.00 an insertion. Allow 10 words for box address.

No additional charge for forwarding replies. Discount of 10% for payment in advance on 4 consecutive insertions of undisplayed advertisements.

Proposals—40 cents a line.

DISPLAYED:

Space is sold by the "inch," with 30 inches to a page. (An "inch" measures approximately 1 inch high by 2 1/4 inches wide.) Rates are from \$4.50 to \$3.00 an inch, depending on the total space used.

0220

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.

S EARCHLIGHT
E RVICE
E CURES
A TISFACTORY
I TUATIONS

G-23

Rotary Converters

1—500 kw., 600-v., 833 amp., 900 r.p.m., 6-ph., compound wound interpole Westinghouse Rotary Converter, with 3—185 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.

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
Westinghouse Air Brake Co.

Air Receivers & Aftercoolers
Ingersoll-Rand Co.

Anchors, Guy
Elec. Service Supplies Co.
Ohio Brass Co.

Armature Shop Tools
Elec. Service Supplies Co.

Asphalt Paint
American Asphalt Paint Co.

Automatic Return Switch Stands
Ramapo Ajax Corp.

Automatic Safety Switch Stands
Ramapo Ajax Corp.

Axles
Bethlehem Steel Co.
Brill Co., The J. G.
Carnegie Steel Co.
Johnson & Co., J. R.
National Ry. Appliance Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Axles, Carbon Vanadium
Johnson & Co., J. R.

Axles, Steel
Bethlehem Steel Co.
Carnegie Steel Co.
Johnson & Co., J. R.
Ludlum Steel Co.

Babbit Metal
Johnson & Co., J. R.
More-Jones Brass & Metal Co.

Badges and Buttons
Elec. Service Supplies Co.
International Register Co.

Barges, Steel
American Bridge Co.

Batteries, Dry
Nichols Lantern Co.

Bearings and Bearing Metals
Brill Co., The J. G.
General Electric Co.
More-Jones Brass & Metal Co.
St. Louis Car Co.
Westinghouse E. & M. Co.

Bearings, Center and Roller Side
Stanki Co., A

Bearings, Roller
Timken Roller Bearing Co.

Bearings, Roller & Ball
S. K. F. Industries

Bells & Buzzers
Consolidated Car Heating Co.

Bells and Gongs
Brill Co., The J. G.
Elec. Service Supplies Co.
St. Louis Car Co.

Benders, Rail
Railway Trackwork Co.

Bodies, Bus
Cummings Car & Coach Co.
Graham Bros.

Body Material, Haskelite and Plymet
Haskelite Mfg. Corp.

Rollers
Babecek & Wilcox Co.

Good Trainers
American Steel & Wire Co.
Elec. Service Supplies Co.

Bundling Apparatus
American Steel & Wire Co.
Elec. Railway Improvement Co.
Elec. Service Supplies Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.

Bonds, Rail
Amer. Steel & Wire Co.
Elec. Railway Improvement Co.
Elec. Service Supplies Co.
General Electric Co.
Ohio Brass Co.
Railway Trackwork Co.
Una Welding & Bonding Co.
Westinghouse E. & M. Co.

Book Publishers
McGraw-Hill Book Co.

Brackets and Cross Arms
(See also Poles, Ties, Posts, Etc.)
American Bridge Co.
Elec. Ry. Equipment Co.
Elec. Service Supplies Co.
Hubbard & Co.
Ohio Brass Co.

Brake Adjusters
Brill Co., The J. G.
National Ry. Appliance Co.
Westinghouse Tr. Br. Co.

Brake Shoes
Brill Co., The J. G.
St. Louis Car Co.

Brake, Brake Systems and Brake Parts
Brill Co., The J. G.
General Electric Co.
National Ry. Appliance Co.
Safety Car Devices Co.
St. Louis Car Co.
Westinghouse Tr. Br. Co.

Bridges, Steel
American Bridge Co.

Brushes, Carbon
General Electric Co.
Jeandron, W. J.
Le Carbons Co.
Morganite Brush Co.
Westinghouse E. & M. Co.

Brushes Graphite
Morganite Brush Co.

Brushes, Wire, Pneumatic
Ingersoll-Rand Co.

Boldings, Steel
American Bridge Co.

Bulkheads
Haskelite Mfg. Corp.

Bunkers, Coal
American Bridge Co.

Bus Seats
Hale-Kilburn Co.

Buses, Motor
Brill Co., The J. G.
Cummings Car & Coach Co.
International Motor Co.
Mack Trucks, Inc.
St. Louis Car Co.
Studebaker Corp. of Amer.
White Co.

Busings, Case Hardened and Manganese
Brill Co., The J. G.
St. Louis Car Co.

Cables, (See Wires and Cables)
Cambrie Tapes, Yellow and Black Varnish
Irvington Varnish & Ins. Co.

Carbon Brushes (See Brushes, Carbon)
Car Lighting Fixtures
Elec. Service Supplies Co.
Car Panel Safety Switches
Consolidated Car Heat. Co.
Westinghouse E. & M. Co.

Car Wheels, Rolled Steel
Bethlehem Steel Co.

Cars, Dump
Brill Co., The J. G.
Differential Steel Car Co.
St. Louis Car Co.

Cars, Gas, Rail
Brill Co., The J. G.
St. Louis Car Co.

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.
St. Louis Car Co.
Thomas Car Works, Perley A. 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
More-Jones Brass & Metal Co.

Castings, Gray Iron and Steel
American Bridge Co.
American Steel Foundries
St. Louis Car Co.
Wm. Wharton, Jr. & Co.

Castings, Malleable and Brass
St. Louis Car Co.

Catchers and Retrievers, Trolley
Elec. Service Supplies Co.
Ohio Brass Co.
Wood Co., Chas. N.

Catenary Construction
Archbold-Brady Co.

Celling Car
Haskelite Mfg. Corp.
Pantastole Co., Inc.

Celling, Plywood, Panels
Haskelite Mfg. Corp.

Change Carriers
Cleveland Fare Box Co.
Elec. Service Supplies Co.

Circuit-Breakers
General Electric Co.
Westinghouse E. & 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.

Cleaners and Scrapers Track
(See also Snow-Plows, Sweepers and Brooms)
Brill Co., The J. G.
Ohio Brass Co.
Root Spring Scraper Co.
St. Louis Car Co.

Clusters and Snickets
General Electric Co.

Coll Banding and Winding Machines
Elec. Service Supplies Co.
Westinghouse E. & M. Co.

Coils, Armature and Field
Economy Electric Devices
General Electric Co.
Westinghouse E. & M. Co.

Coils, Choke and Klekking
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & 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 Sletters
Elec. Service Supplies Co.
General Electric Co.
Westinghouse E. & M. Co.
Wood Co., Chas. N.

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Ingersoll-Rand Co.
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Samson Cordage Works

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Crossings, Trolley
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Curtain Supply Co.
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Salzberg Co., Inc., H. E.
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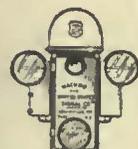
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Create Public Good Will with Comfortable Seats—

Brill

No. 105-B Type for Single-end Cars

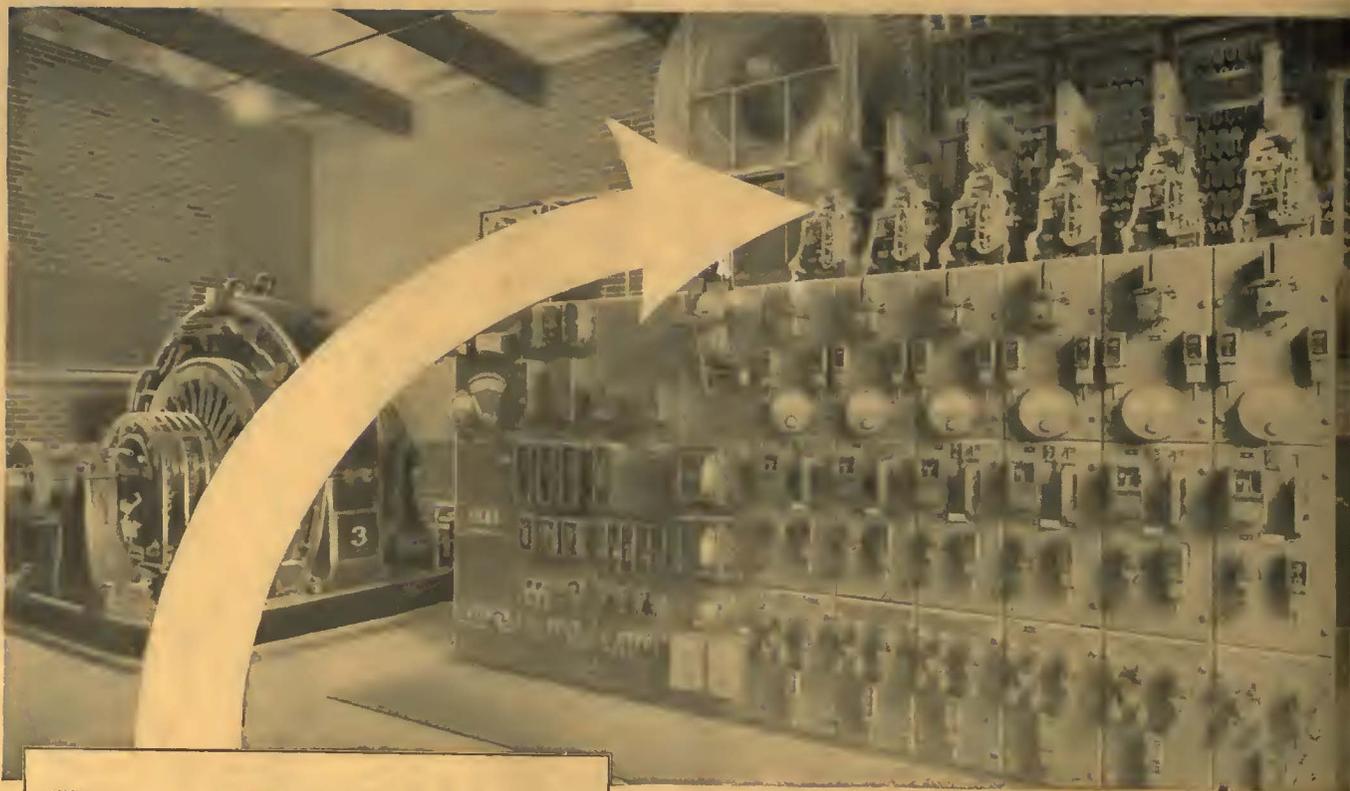
MANY electric railways are demonstrating the importance of comfortable seats in creating favorable public relations. Greater consideration is being given to this factor, resulting in the development of many types of car seats in which comfort and appear-

ance are outstanding features.

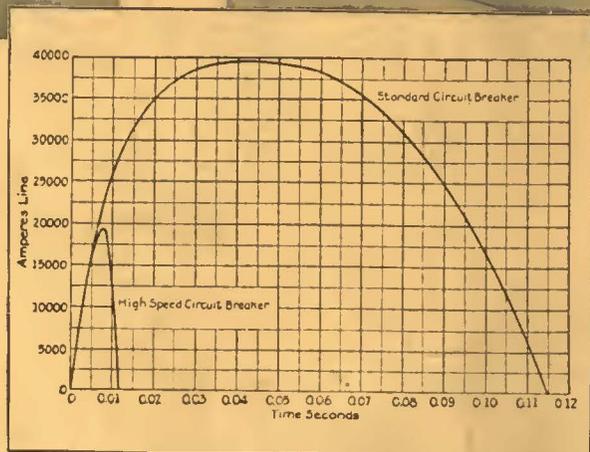
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Bulletin 44742.1 describes the G-E High-Speed Breaker. Your G-E Office has copies.



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