

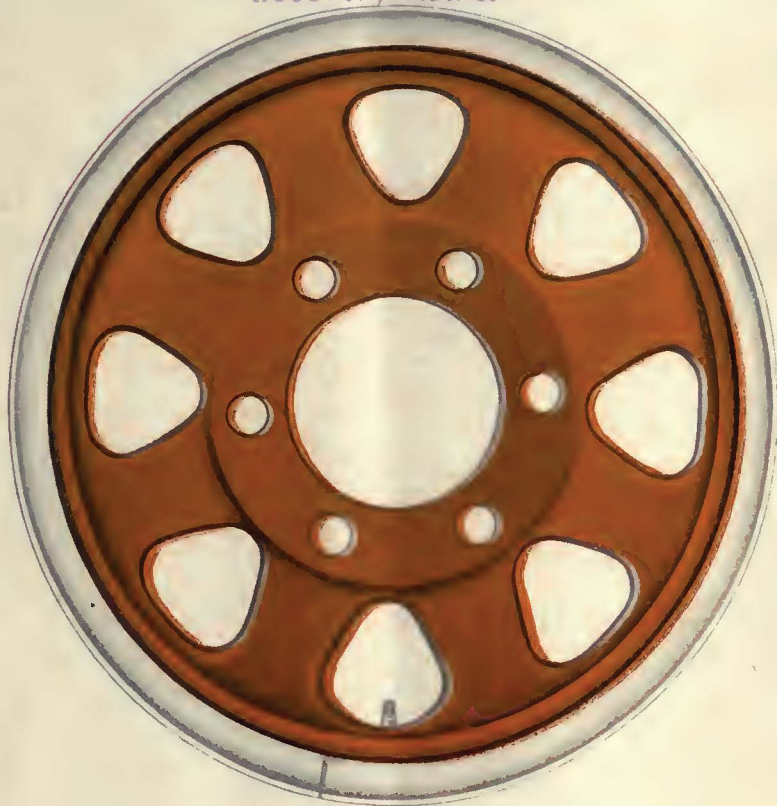
ELECTRIC RAILWAY JOURNAL

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JUNE 2, 1928

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Above—The Home of Republican National Convention.

Left—A One-Man Car in Kansas City with Westinghouse motors.



In Kansas City—

THE interest of the nation now centers upon Kansas City and Houston, acting as hosts to the National Conventions of Republicans and Democrats, respectively, in June.

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Up-to-date cars, rebuilt track, an efficient personnel, and Westinghouse motors and control make the superior electric railway service possible in these flourishing cities.



In Houston—

Below—The Home of Democratic National Convention, seating 25,000 people.

Right—One of the new 20 de luxe cars recently placed in service in Houston. They have Westinghouse Type 510 Motors and K Control.



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Vol. 71, No. 22

June 2, 1928

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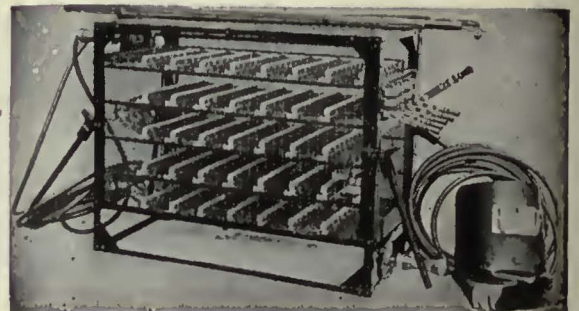
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A sturdy recess mounted incandescent headlight. Furnished with either Crystal or Gold Ray Prismatic glass 8 $\frac{3}{4}$ -inch reflector. Adjustable lamp receptacle, for regular or focus type lamp, 23 to 94-watt lamp may be used. Case and door of heavy Armco sheet steel, finished in baked black enamel. Door hinged at top and fitted with Standard plunger door catch. Convex lens of heat resisting glass. See page 33, Catalog Supplement No. 1.

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ON the new cars for a large property in an Eastern city, O-B Headlights have again demonstrated that they are the most suitable headlights for large as well as small properties.

Lowest first cost is an important consideration. Almost total elimination of maintenance for a long period of years is another. Both are combined in the ZP Special—the O-B Headlight expressly designed for city service.

The ZP Special is a recess mounted incandescent headlight of extremely shallow design, fitted with an 8 $\frac{3}{4}$ -inch Prismatic glass reflector. Beam spreads on a horizontal plane, illuminating both sides of the track, yet giving ample pick-up.

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five years of
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in every

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safety,
sanitation,
resiliency,
economy.

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- 3 The slip-proof construction minimizes the danger of accidents to passengers as they furnish a secure footing in both wet and dry weather.

The Wear-Proof Mat besides its practical features furnishes a covering that greatly enhances the interior attractiveness of cars. It can be supplied in any rectangular shape and in one or more pieces.

If you are outfitting cars, The Wear-Proof Mat is a feature you can't afford to neglect for appearance and economy. We'll be glad to send further particulars on Wear-Proof Mats if you'll write us.

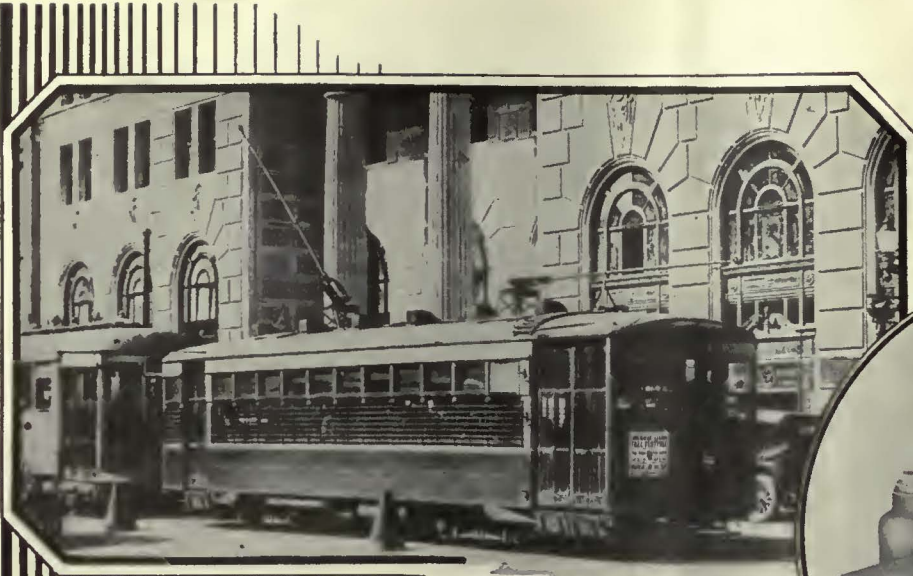
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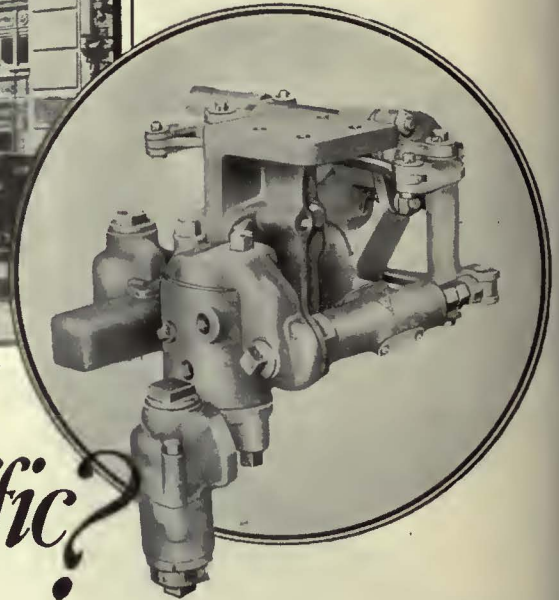
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Confer with our representative regarding the desirability of Westinghouse Variable Load Brakes for *your* new cars.

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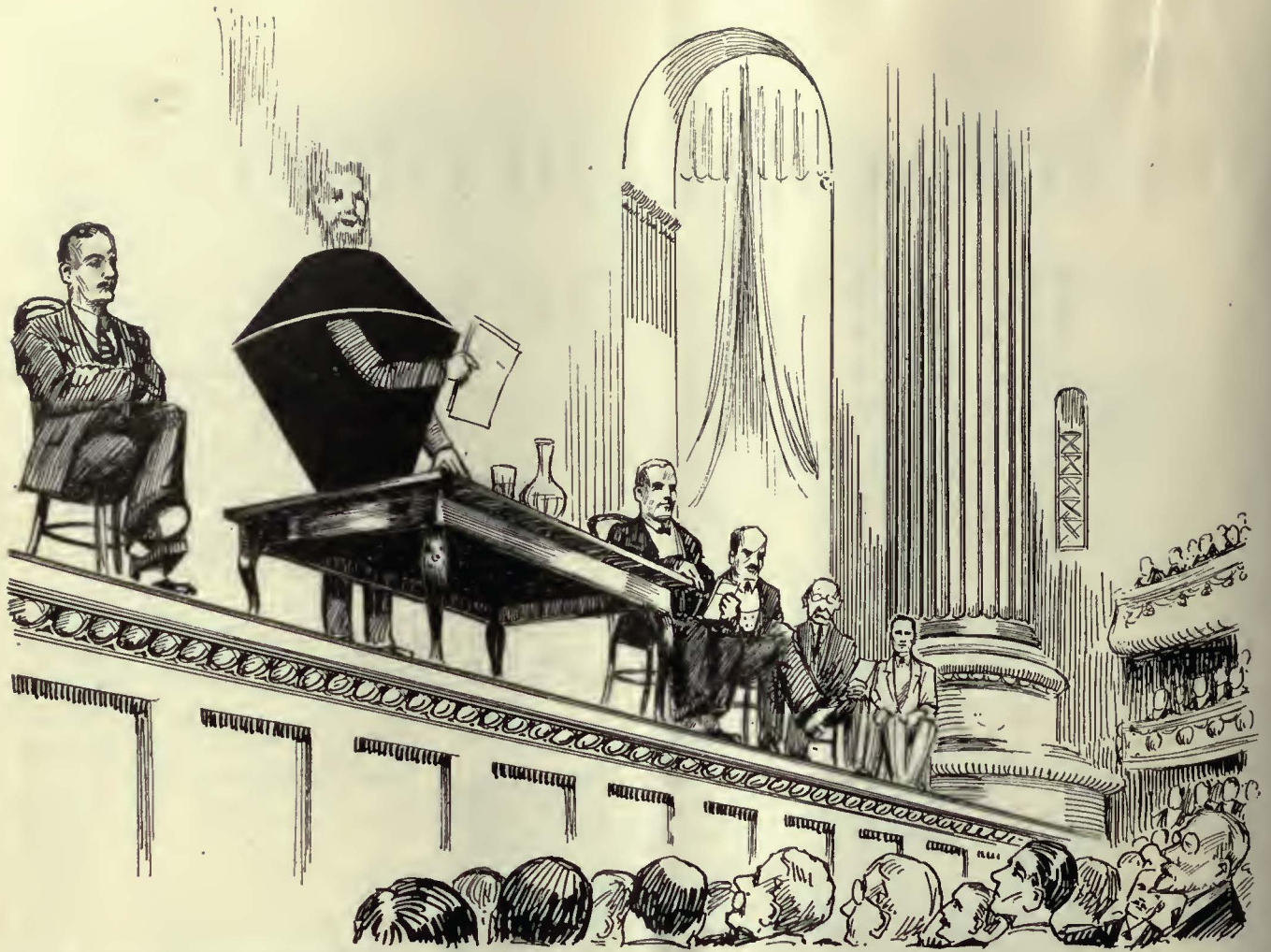
Let us quote you on delivered prices for third quarter delivery. Have you seen the new compression tamper? We'll be glad to arrange a demonstration—on *your* property.

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CLEVELAND, OHIO

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Let your engineer act as judge of the "joint" debate. He's qualified by training and experience to best appreciate the arguments.



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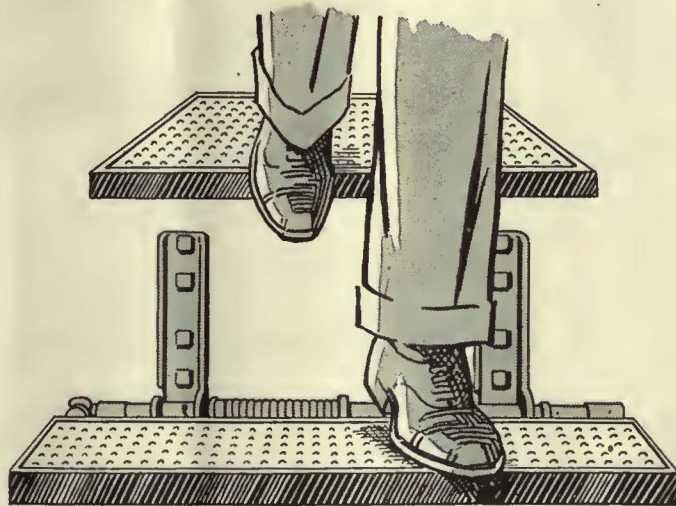
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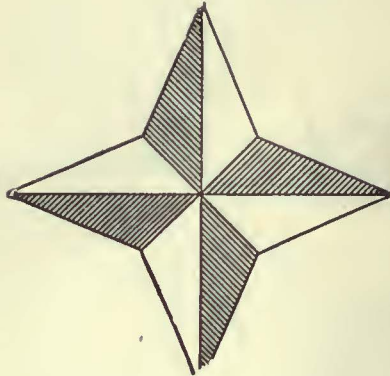
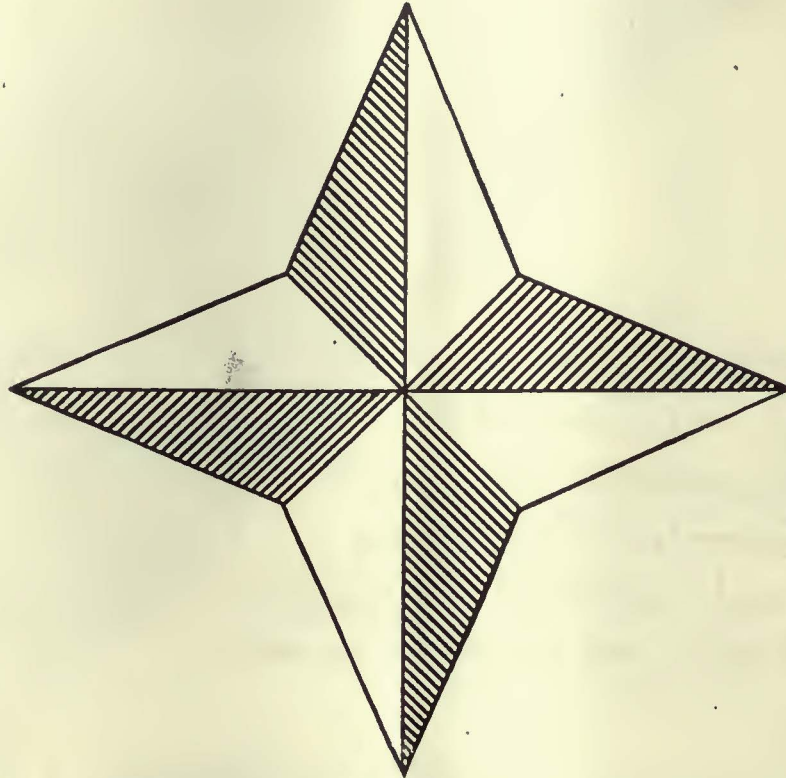
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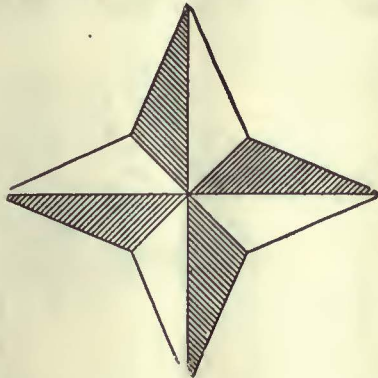
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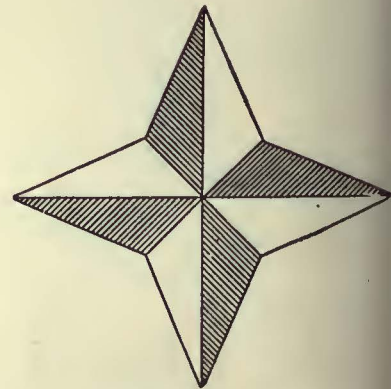
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“Beauty with Low Cost”



“Lightweight with Strength”



“Capacity with Comfort”

means fast schedules and a decrease of 30% to 60% in stopping time

Cincinnati BALANCED LIGHT-WEIGHT cars are maintaining, consistently, fast schedules wherever they are in operation.

They are writing an enviable record in reports of "accidents prevented," due to their CINCINNATI DUPLEX AIR MAGNETIC BRAKING EQUIPMENT.

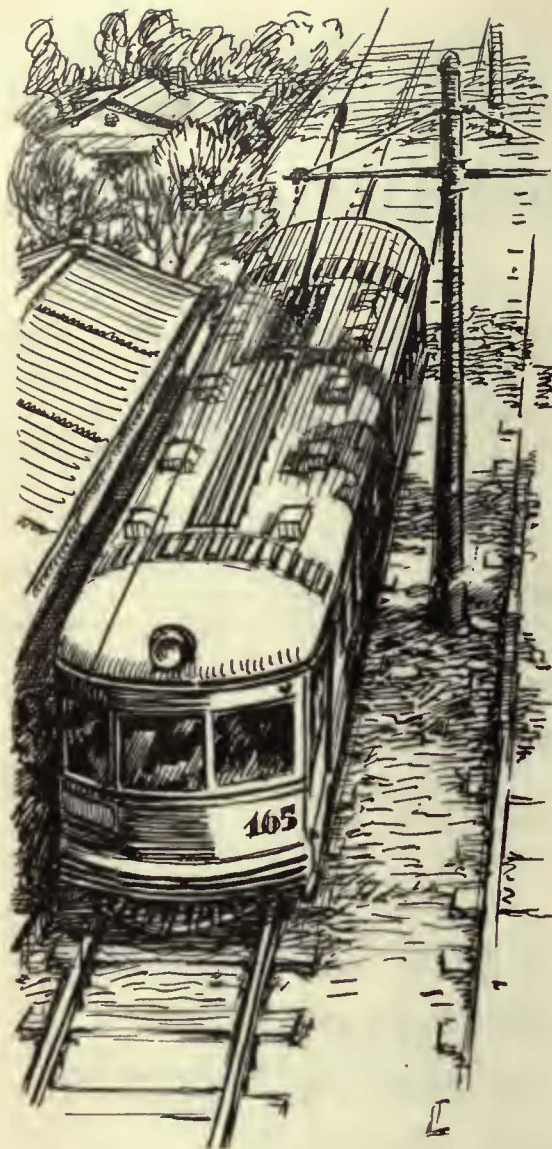
What will a decrease of from 30% to 60% in the time required to bring your cars to a halt in an emergency mean in reduced accident claims?

We will be glad to show you actual reports.

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CINCINNATI BALANCED LIGHTWEIGHT CARS

{ The Four Features of
Balanced Design are
the Cardinal Points of
today's demand. }



IN FAST INTERURBAN SERVICE—

How about your wheels?

Standard Wheels carry hundreds of thousands of passengers to the cities and back again every day. The speeds and quick stops necessary to maintain competitive schedules put unusual tax on wheel stamina.

Standard Wheels hold up!

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IN SERVICE 28 YEARS
ARE STILL IN
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Illustration shows International Poles in service on the Union Pacific

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The International
Dating Nail

International Creosoted Yellow Pine Poles



ELECTRIC DRIVE
for
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 AND TRUCKS

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GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

Preserving the Peace

In suburban districts of great cities there is peace.

That's why bread-winners go there to live and to bring up their children—to escape the noise and nervous strain of the roaring city.

They resent the intrusion of noisy buses, but they welcome those equipped with G-E gas-electric drive.

A suburban territory in the East recently granted a bus franchise with the condition that only gas-electrics should be used.

390-27

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SALES OFFICES IN PRINCIPAL CITIES

ELECTRICITY IMPROVES SERVICE AND INCREASES REVENUE



THE
GREAT NORTHERN
*electrified to improve
operating conditions*

When the Great Northern built a four-mile tunnel under the peak of the Cascades, the operation of steam locomotives was attended with difficulty, and electric locomotives were substituted. This was in 1907.

The results were so satisfactory that when a greater tunnel was undertaken in 1925, it was decided to equip this, too, for electric operation and also to electrify 66 miles of heavy grade at the ends of the tunnel. Locomotives of the motor-generator type, among the largest in the world, were selected.

These locomotives, which overcome mountain grades without loss of scheduled time, will keep the tunnel free of smoke and dirt and will make it possible to draw luxurious passenger trains and heavy freights with speed, frequency, and comfort—while materially decreasing the expense of operation.

Not only in mountainous divisions, but on the long, level stretches of main line, electric operation produces more revenue, simplifies operation, reduces maintenance, and gives better service.

Manifold advantages of electric operation have resulted from the use of electric locomotives and cars on main and branch lines, at terminals, and in suburban traffic; gas-electric cars for light-traffic lines; oil-electric locomotives in freight yards; and gas-electric buses for feeder service. Electric floodlights expedite freight sorting, and electric signal systems promote safe transportation.

**AMERICAN LOCOMOTIVE
GENERAL ELECTRIC**

Electric Railway Journal

McGraw-Hill Publishing Co., Inc.
JAMES H. MCGRAW, President

Consolidation of
*Street Railway Journal and
Electric Railway Review*

CHARLES GORDON
Editor

Volume 71

New York, Saturday, June 2, 1928

Number 22

Fares, Too, Can Be Made to Please the Patrons

EVIDENCE that it is possible to obtain more revenue from the riders on a street railway system and do it while pleasing the public rather than antagonizing it is given in the article by H. E. Weyman in this issue. When revenues were decreasing, some three years ago, he introduced a weekly pass on a portion of the system and at the same time increased the cash fare. Much care was used to inform the regular riders that they could obtain their transportation with no increase of rate by the purchase of passes. The plan proved so successful that later the pass was extended to cover all the zones. A glance at the charts shows that there was an increase in the cash fare at the same time that there was an increase in the regular riders who used either passes or reduced-rate tickets.

Previously tickets had been sold at four for 30 cents. Under the new plan they are sold at six for 45 cents, the idea being to discourage the use of the reduced rate and to encourage the use of the pass. As a rule it is a poor policy to adopt a rate that is awkward, or in any other way penalize the regular or semi-regular user of the service. It would be more in line with modern ideas to make the rate six for 50 cents, or if that could not be obtained, to sell seven for 50 cents. The loss of time and the inconvenience involved in making change at the odd rate would seem to make it undesirable, and the investment at the 50-cent rate would be so little more that few persons would be deterred by the difference.

The excellent results obtained in Levis indicate that much credit is due to care used by the management in introducing the new fare system and in keeping it popular after it was introduced. Items published in this paper from time to time indicate that many things have been done to make the fare system popular. Although, as Mr. Weyman states, the effect of introduction of the new fare schedule was feared, the whole-hearted manner used in putting it into effect has resulted in its being very much of a success.

A Modern Maintenance Plant

PROVISION of adequate maintenance facilities is an important part of the major rehabilitation program being carried out in the cities of Springfield and Worcester, Mass. The new Grove Street carhouse and garage, on which an article is published in last week's issue, are intended to provide facilities which will insure adequate and economical maintenance of the new cars and buses that have been purchased for the Worcester property.

Two general features of the Grove Street plant are of particular interest. Here, a modern carhouse and a 50-bus garage are located on a single plot of land so as to avoid duplication of air compressors, boilers for

steam and hot water, and other service equipment. This installation represents an ideal combination of a carhouse and garage. There is an opportunity here for co-ordination of maintenance work on cars and automotive vehicles and at the same time provide the facilities required for each type of vehicle.

Although there is nothing specially unusual in the general design of the garage, the depressed pit section is particularly interesting. The plan of piping grease and transmission oil under pressure directly to conveniently located outlets in the pits has a double advantage of reducing lost motion and at the same time making it possible to keep pits clean and sanitary. With respect to the facilities provided for efficient bus maintenance perhaps the greatest interest attaches not so much to the garage building as to the maintenance equipment which has been installed. When selecting the machinery for the Grove Street garage attention was given to the heavy duty which such equipment must withstand in bus maintenance work.

Pittsburgh Joins the Pioneers

IT WASN'T very long ago—less than three years, in fact—when railway men looked upon the exhibit of the Grand Rapids Railway at Atlantic City with feelings that ranged from wonder to amusement. Here was a railway actually trying to make its street cars attractive to patrons. Here was a railway trying to make car riding popular, by improving the appearance of the vehicle. Leather upholstered seats! Band brakes! Skirts on the sides! Bright colors! Shades of the horse car! No one but a circus man would try to do that to a street car. That might be all right for buses, but for cars—railway executives stopped and looked, but kept their opinions to themselves!

Since that time W. L. Harwood pioneered the Springfield car, J. R. Blackall the Joliet car—and many other cars that followed have attracted the industry's attention. Last year at Cleveland more radical departures from conventional practice were shown in a single exhibit than the industry had seen in a decade. Now comes the Pittsburgh car! Read the article elsewhere in this issue! Surely something has been happening in the industry since L. J. DeLamarter had the temerity to strike out for something better in the way of a street car.

The new Pittsburgh cars are frankly experimental. They include practically every innovation in car design tried up to this time, with the possible exception of the substitution of aluminum for steel in body framing. In addition, other features are being tried for the first time. The purpose is to make possible an exhaustive study in actual operation of factors likely to appeal to passengers. The Pittsburgh management also expects to determine from actual experience with the vehicle in service the practicability of many equipment features proposed for the improvement of car performance.

Undoubtedly some of these will not stand the test of

mass transportation service. That is what the Pittsburgh company is trying to find out. It proposes to utilize that experience in selecting Pittsburgh's future car equipment. Of one thing the management is convinced. The appearance and performance of electric railway cars *must* be improved if rail service is to meet and overcome the competition of the privately-owned automobile.

Perhaps the equipment on these cars is too complicated. Even if produced in large quantities they would undoubtedly be expensive in first cost and maintenance. Simplicity is an important characteristic of design, along with appearance, comfort and performance. A reaction has already set in from the glaring color combinations of some of the early attempts to beautify cars. A similar reversal toward simplification of equipment may be expected in the evolution of improved performance. Cost, reliability and ease of maintenance must be kept in mind in the effort to improve the street car.

Although the Pittsburgh cars are the most recent in the rapid series of car innovations, they are only the forerunners of many more to come. The metamorphosis of the street car is in full swing, and all signs point to its emergence from an ugly duckling to a thing of beauty and pride on our city streets—to use an imperfect metaphor. There are indications that the small, light, four-wheel car may be expected to play an important part in this evolution. Even the trolley bus in this country is showing signs of revived vitality.

All of these things give increased emphasis to the declarations of those who have said that after 40 years of local transportation we still have much to learn. Pittsburgh is doing its part. It is entitled to full credit in undertaking to put to the test of experience many of the recent innovations that have attracted interest.

Chicago's 5,441 Honor Men

GUIDING a street car successfully through the intricacies of traffic in a city such as Chicago day in and day out is a real achievement. And when 5,441 men do it for a whole year without a single accident the performance takes on an unusual aspect. Yet this is the record that men in the employ of the Chicago Surface Lines achieved last year.

On its part it would seem that the general public is disposed too much to accept meritorious service as its right. Trains whirl through the night at high speed, boats plough the seas beset by storm and fog and many other dangers, street cars speed through city streets encompassed at all times by a thousand hazards. It is true that on the common carrier rests the obligation to get the passenger through safely to his destination, but the hazards are great and the likelihood of human failure is always present. A child killed in the street, a passenger maimed or a pedestrian injured can mean only woe in some household somewhere.

Only at the occasional occurrences of man-failure is the public aroused, often negatively rather than positively. This is a tendency from which even the railways, the Chicago system among them, have not been free. In fact, the former plan of keeping accident records in use by that company tended to focus attention on the few men who were in trouble rather than on the many who were satisfactorily performing their daily duties. That point of view has now been reversed.

Heroic or spectacular achievement deserves its reward, but after all it is the day-by-day work accomplished, often with great celerity but with none of the aspects of

the spectacular, that counts. It is never pleasant to contemplate the theory of chances as applied to the matter of hazards to which everyone always is subject. The obligation to be careful is not lightly accepted by public service corporations, but it would be reassuring to know that all drivers of vehicles had been subjected to tests comparable in their severity to the ones to which all motormen and conductors must first submit before they are accepted as being qualified for their tasks.

The preponderance of men on the Chicago Surface Lines who have won the right to wear the insignia of merit which stamps them as being most careful should be reassuring to all users of the company's service who do not take life with a spirit that is carefree. Certainly the Chicago Surface Lines has every reason to be proud of its record. And the citizens of Chicago have every reason to be proud of the organization which established that record. It is an unusual accomplishment. The results attained were achieved only by constant vigilance sustained by a properly aroused sense of individual responsibility.

Safety Campaigns Need Concentrated Responsibility

DURING the recent "Safety—Save a Life" campaign, held in Philadelphia, an article on which appears elsewhere in this issue, the accident rate kept right on increasing. The number of accidents, both in the city and in the state of Pennsylvania, was greater than during a similar period in 1927. From this it might appear that safety campaigns are merely "open seasons" for the running down of pedestrians and the mutual destruction of autoists.

Yet if the campaign of this year is compared with the "Will Livelong" safety campaign conducted by the Philadelphia Rapid Transit Company in Philadelphia in April, 1927, some interesting observations may be made. Last year's campaign, for which the local transit organization was almost wholly responsible and which it financed entirely, produced a reduction in street fatalities during April of 26 per cent as compared with the similar month in 1926. Within the company organization an excellent record was established for reduction in car collisions and all types of accidents during the campaign. This year, while it seems that the divided responsibility for the drive produced no tangible results in increased street safety for the city, the transit organization was able to effect a further reduction in its own accident record.

This comparison seems to show that any city-wide movement, whether it be for safety or for some other purpose, needs a definite co-ordinating influence. Where the responsibility is left to individual organizations to pick up various phases of the work and carry them on independently, there is lacking an all-important unity of effort. The inertia in a large city and particularly in a state the size of Pennsylvania is great and cannot be overcome in a short period or by scattered effort.

The passing of kindly old Will Livelong, the safety sage, from the picture in Philadelphia was to be regretted. The personal type of campaign built around a central figure was able to reach the heart chords of the average citizen and to arouse him from an apathy which no amount of pure logic and reasoning could touch. Perhaps the old man might be brought back on the job again. It seems that he or some character like him was sorely missed this April.

The policy of Mitten Management in providing for

continuous safety work on its properties and for their active participation in civic movements to promote street safety in their respective communities is to be commended. The recent campaign in Philadelphia was effective from the standpoint of the local transportation company, at least, and possibly its influence upon the city as a whole will not be lost.

The safety patrols established years ago by the P.R.T. in the schools of Philadelphia, and now carried on directly as part of the regular school work, may be an object lesson to educators in other sections of the country. Safety patrols such as these are, of course, the nucleus around which any safety instruction in the schools is built in Philadelphia. Proper training of the children today will make for a more common-sense attitude toward the traffic and street safety question on the part of the adults of tomorrow.

Certainly no one can question the necessity for placing frequent emphasis on personal safety, pedestrian control and driving care on the streets and highways. But an occasional safety drive will have little effect unless the work just begun is carried on by the schools and similar organizations of the city which are charged with the normal education of its citizens.

Non-Political Control Suggested for Municipal Railway

SUPERINTENDENT Boeken of the Municipal Railway at San Francisco ought to know what he is talking about when he discusses the operation of that system. He says there need be no alarm for the future financial welfare of the system if recommendations he has made are carried out. Then he proceeds to say that the ability of the system to pioneer and develop new districts on a 5-cent fare has been over-rated; that it would have been wiser had reserves for depreciation been kept at a healthy level; that it does not appear feasible to reduce service as a measure of economy; that bus lines have been unprofitable, and that transfers between cars and buses should be abolished. Most important, the superintendent says that it must be plain to anyone that in order to preserve the railway as far as possible from political control and influence, it is imperative that a non-political public utility commission be created and be entrusted with the future destinies of all of San Francisco's public utilities.

Thus did Mr. Boeken stick his head into the noose. He has told the truth as he sees it and has shamed the devil. As the *San Francisco Chronicle* sees it, Mr. Boeken might as well have saved his breath. According to that authority, the only hope for taking the railway out of politics lies in the passage of the charter amendment on Aug. 28 under which there would go to the Legislature for ratification a plan for commission control similar to the one to which the superintendent of the railway has referred. That may or may not be the answer. Off hand, a commission of this kind, presumably dominated locally, would appear to be merely another subterfuge under which, by remote control, the politicians will eventually exercise their influence.

The future of the municipal railway certainly is a matter of speculation. The present shows one set of politicians proclaiming the municipal railway to be a mint, and another set proclaiming it to be bankrupt. As the *Chronicle* says, poor Mr. Boeken is rolled between the two of them because he had the temerity to make the

situation clear and to suggest that politics be bumped off the track. Certainly the superintendent brought out many illuminating things about the municipal railway. On the basis of its contents the report might be converted into a preachment against municipal ownership, but that is not necessary, since the report is its own best commentary on the result of the attempt at paternalism entered upon by the city of San Francisco when it went in for running its railway.

Electric Railway Practice on Both Sides of the Atlantic

EUROPEAN electric railway practice in many respects does not differ greatly from that in America. This is indicated in the abstracts of the six papers presented at the Rome Convention of the International Street and Interurban Railway & Bus Association and published in this issue and that for last week. The topics that are treated do not differ from those which might have been discussed at almost any electric railway convention in this country. There are two papers on one-man car operation, two papers on truck design, one paper on track construction in city reservations, and one paper on improvements in rails and ties.

Europe has been behind this country in the proportion of cars operated by one man. Wages there are not so high, so that the need has not appeared so great. The zone-fare system in use in many cities has been thought an operating obstacle. But with the increase in one-man cars in Europe, which is now apparent, many features in car design, such as power-operated doors, which up to this time have been considered distinctly American, will probably come into more extensive use. It is significant that the four cars for one-man service, recommended by Mr. Bacqueyrisse, are equipped with power-equipped doors and treadle exit doors. Paris now seems committed to one-man operation of at least some cars and buses.

Two other papers relate to radial axle cars. The greater interest in this subject in Europe than here lies largely in the more extensive use abroad of single-truck cars because of the narrow streets, and the effort to prevent nosing and teetering on these cars when mounted on short wheelbase trucks. The papers indicate that most of the efforts toward radial axles so far tried in Europe have not proved very satisfactory, though one writer attributes at least part of the poor results to failure to use the right design.

Another paper relates to track construction in city reservations. American city planners have failed lamentably in most places in providing space in boulevards which can be used exclusively, except at street intersections, for railway track. If all the cities had been designed like New Orleans, Mobile, and a few others which might be named with reservations of this kind, street transportation problems would be much simpler than they are at present. Fortunately European designers in modern times have had this need in mind, and Mr. Lenartowicz points out their great advantages in the way of increasing car speeds and so postponing the need for elevated or underground rapid transit lines. Daniel L. Turner has advocated the same plan for city extensions in Detroit, Long Island and elsewhere. It is hoped that street widths sufficient to permit such central reservations will be the rule and not the exception for arterial highways in the future.

Pittsburgh Seeks More Popular Street Car

Two experimental cars recently received from the builder incorporate many innovations intended to improve service and make street cars more attractive to the public. Railway company considers car improvement of vital importance in meeting automobile competition

By Charles Gordon



DETERMINED effort to seek out those improvements in electric railway equipment that may be expected to appeal to riders through better performance and greater attractiveness, is represented in two experimental street cars recently delivered to the Pittsburgh Railways and exhibited to the patrons of its system. Graceful lines and proportions, high acceleration and braking rates, smooth and quiet operation, comfortable seats, ample aisle room for rush-hour travel, low step heights, and economical operation, were some of the major objectives sought in the design of these two new cars. Ideas from the automotive vehicle were frankly incorporated wherever they were considered worthy of a trial in car construction. Several features represent so wide a departure from previous electric railway practice, that they were included with the full understanding that they may prove impracticable under the severe conditions of low price, mass transportation service.

Because of this recognition by the Pittsburgh company of the need for car improvement, and the daring innovations incorporated in this experimental equipment to de-

An unusual seat arrangement is one of the features being tried in the Pittsburgh cars

The wide aisle gives large rush-hour capacity, while the stanchions are intended to provide comfortable standing facilities at high acceleration and braking rates.

termine the possibilities of developing a more merchandisable street railway service, particular interest attaches to some of the features of these two cars. They were built by the Osgood-Bradley Car Company under the direction of the railway

company's engineers, and in co-operation with the Westinghouse Electric & Manufacturing Company and the Westinghouse Air Brake Company. Recognizing the need for stimulating car builders and manufacturers to the exertion of their initiative and ingenuity in meeting the present-day demand for car improvements, the Pittsburgh company limited itself to outlining generally the objectives sought in these cars, and permitted the manufacturers to work out the details of design and equipment. Throughout the design, many of the ideas previously developed by W. L. Harwood in the Springfield experimental car, published in the March 26, 1927, issue of *ELECTRIC RAILWAY JOURNAL*, and by J. R. Blackhall in the Joliet car, published in the April 2, 1927, and Dec. 17, 1927, issues, were followed.

Both cars are similar except that they are mounted on

different types of trucks equipped with two sizes of motors. Many of the motor, control, truck and brake features incorporated recently in various experimental cars are included in these two Pittsburgh units, and in addition, there are a number of new ideas being tried for the first time. The electrical equipment includes semi-pneumatic, magnetic, remote motor control of Westinghouse manufacture, having manual acceleration and automatic, regenerative braking. The control resistance is used for car heating during acceleration and electric braking. Electrically controlled air brakes are also included, the brake handle being used merely to establish electrical contacts for the operation of remote brake valves assembled in a special equipment box under the car. One car is mounted on Timken worm-drive trucks with internal expanding, automotive type brakes, equipped with 35-hp. motors and 26-in. diameter wheels. The other has special Osgood-

Considerable success has been achieved in carrying horizontal body lines across the vestibules without breaking the lines at the doors. This results in a stream line effect, intended to give the car a graceful appearance indicative of speed and comfort. The bottom line of the lower step is carried around the dash to the blind side of the vestibule at each end of the car, and then tapers up from the body corner post until it meets the bottom line of the side sheets. Thus the vestibules are symmetrical on both sides, and the unbalanced appearance so often characteristic of cars with inside steps, is eliminated. Since no skirt is used below the sides of the body, the general treatment of the vestibules gives them a very low-hung appearance, as is shown in accompanying illustrations. The roof is painted steel gray. Above the belt rail the body is a neutral shade of green. A broad orange stripe extends completely around the body and vestibules



One of the two experimental cars recently put in service by the Pittsburgh Railways in the effort to develop a more popular type of street car. High acceleration and braking, attractive appearance and individual seating are features of the design

Bradley trucks, 50-hp. motors. W-N drive, 24-in. wheels and a new arrangement of brake rigging using Westinghouse automotive type diaphragms to actuate conventional cast-iron brake shoes on the wheels. The units are designed for high acceleration and braking rates and for free running speeds considerably above those usually attained by city cars. They are of the low floor, arch roof type with two inside steps front and rear, and are arranged for one-man, front entrance, rear exit, single-end operation. They incorporate the sloping type of front window adapted from automotive vehicle practice on several recent experimental cars, and in addition are equipped with sashless plate glass side windows similar in design to those used on automobile and bus bodies. Inside folding doors are set flush with the body corner and vestibule posts, to give a smooth exterior appearance. The vestibules at each end of the car taper in from the body on both sides. The front dash is comparatively flat below the belt rail, and the use of double headlights indicates the further influence of automotive practice. Since the cars are for single-end operation only, the two vestibules are not alike, the rear end being rounded and equipped with vertical windows arranged to open similarly to the body side windows.

at the belt rail. The lower half of the car is blue. These colors are carried across the doors at both ends so as to emphasize the stream line effect.

Simplicity characterizes the interior appearance, which presents an unusual effect because of the radical departure from conventional practice in the seating plan, and the large number of stanchions along the aisles. A single row of stationary, individual, special bucket type seats made by the Hale and Kilburn Company are arranged along each side of the car so that the passengers face toward the center line at an angle of 45 deg. to the direction of motion. The chair backs are covered on the front surface with canvass-lined rattan, and on the rear with painted sheet steel. A round leather cushion in each seat is mounted on a formed steel pan, which in turn is fastened to the pedestal brackets at three points spaced on a triangle, so that when the cushion is worn on its front edge it may be mounted in two other positions to prolong its life by distributing the wear. Clearance of about $\frac{3}{4}$ in. is allowed between the cushion and the surrounding back frame for easy cleaning. The cushion and back are pitched to give a comfortable seating angle, the front edge of the cushion being about 17 $\frac{1}{2}$ in. above the floor. The circular shape of the seats permits them to be stag-



All apparatus in the front vestibule is inclosed in cabinets. Liberal door space permits easy access for inspection and repair. The control switch groups are in the cabinets at the left

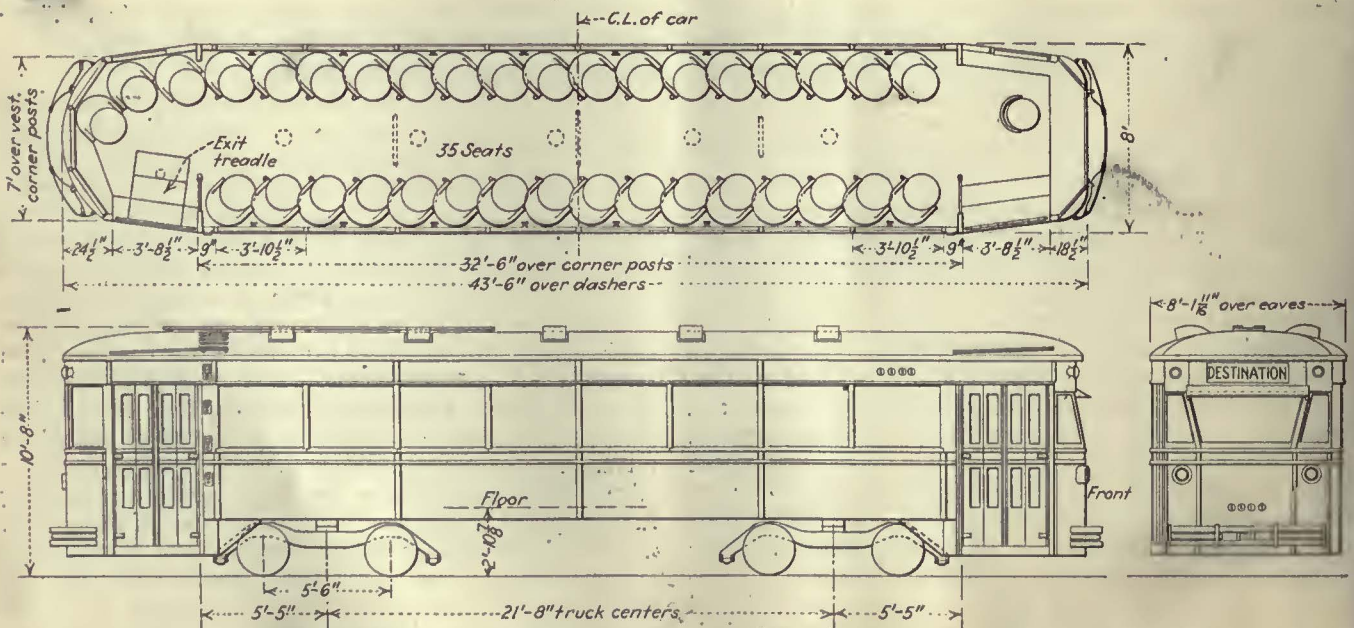
gered behind each other on a 23½-in. spacing, thus giving a seating capacity of 35.

No hand straps are used. Adjacent to each seat, however, along each side of the aisle, are two rows of stanchions extending from the floor to the roof. This arrangement is intended to give a wide aisle with comfortable supports for standees and to prevent falling in the cars even at the high accelerating and braking rates for which they are designed. In one car the stanchions are finished in white enamel and in the other they are nickel-plated. Although the plan of using a single row of seats on each side gives a total seating capacity of only 35, it was felt that this might not prove objectionable to passengers if ample room and supports for comfortable standing in the rush hours were provided. It was assumed to be impossible with any seating arrangement, to provide seats for all passengers in the peak periods of the day. Likewise, it was argued that a seating capacity of 35 per car is more than ample to provide seats for all passengers in the non-rush hours. A further considera-

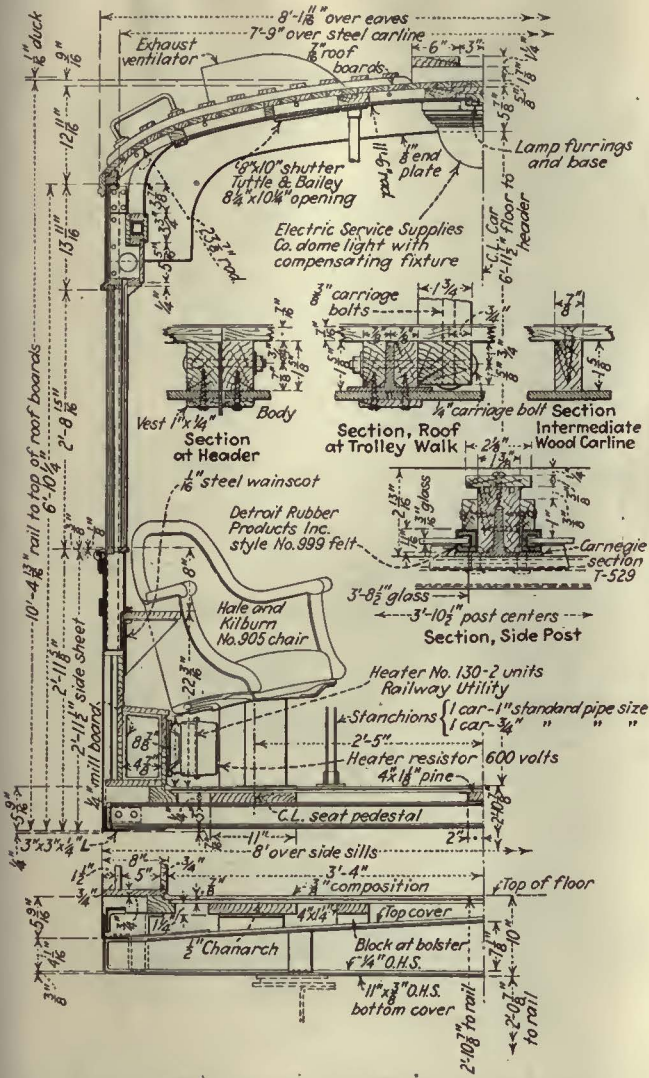
tion is that the apparent reduction in the number of seats per hour that would be provided on a line in which this type of car were substituted for cars with conventional seating arrangement, would be partly offset by the practice in Pittsburgh of increasing service approximately 30 per cent when changing from two-man operation to one-man on a given line. This experimental seat arrangement is being tried, therefore, on the theory that it may prove desirable to provide more comfortable standing room during the rush hours at the expense of some reduction in the number of seats, to make possible the use of a more comfortable and desirable type of seat. These are available for those passengers who do obtain seats during the rush hours, and, if they prove popular, are expected to stimulate the use of the car service during the off-peak traffic periods. Although this in general constitutes the reasoning which led to the adoption of this novel seating plan, the Pittsburgh management considers the whole idea entirely experimental and subject to the test of experience.

No attempt was made in the design of these cars to achieve extremely light weight. They are 43 ft. 6 in. long over dashers, 32 ft. 6 in. over the body corner posts, 8 ft. 1¼ in. wide over the eaves, and 10 ft. 8 in. high from rail over trolley boards. An unusually wide side post spacing of 3 ft. 10½ in. is used to provide a maximum glass opening and to help in giving the cars a long, rakish appearance. The trucks are spaced on 21-ft. 8-in. centers. The front and rear door openings are the same, being 3 ft. 8½ in. The framing is of steel, built up of standard sections. The entire floor, including the vestibules, is level, without ramps, and consists of Flexolith composition laid on Chanarch steel supported on suitable furring members fastened to the underframe. Double inside steps are used front and rear to keep the step height low. On 26-in. wheels, the body floor is approximately 2 ft. 10⅞ in. above the rail and the step heights are 14⅞ in., 10 in. and 10 in. respectively. On one car, which is mounted on 24-in. wheels, the first step is correspondingly reduced. The car with 35-hp. motors weighs approximately 35,000 lb. and the one with 50-hp. motors, 36,500 lb.

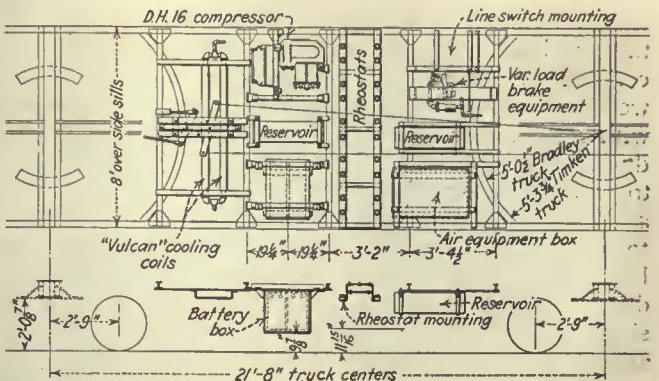
The main body side posts and carlines are rolled steel



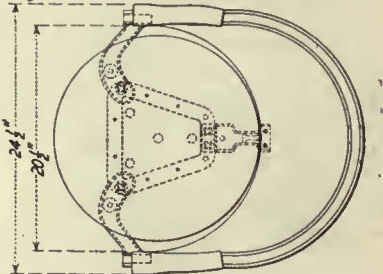
Seating capacity of 35 is obtained in the experimental Pittsburgh cars by staggering the two single rows of seats as shown. The cars are 43 ft. 6 in. long, 8 ft. 1¼ in. wide over the eaves and weigh 35,000 lb. and 36,500 lb., respectively



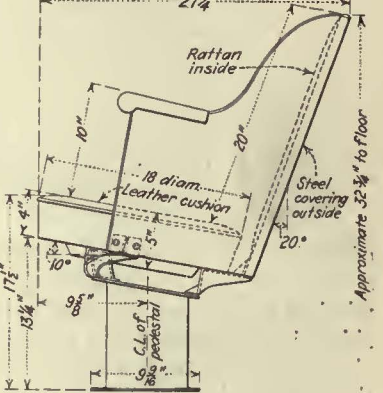
Cross-section showing principal features of Pittsburgh experimental car body construction. The sashless plate glass windows slide in felt grooves into pockets in the body side which permit them to be lowered 10 in.



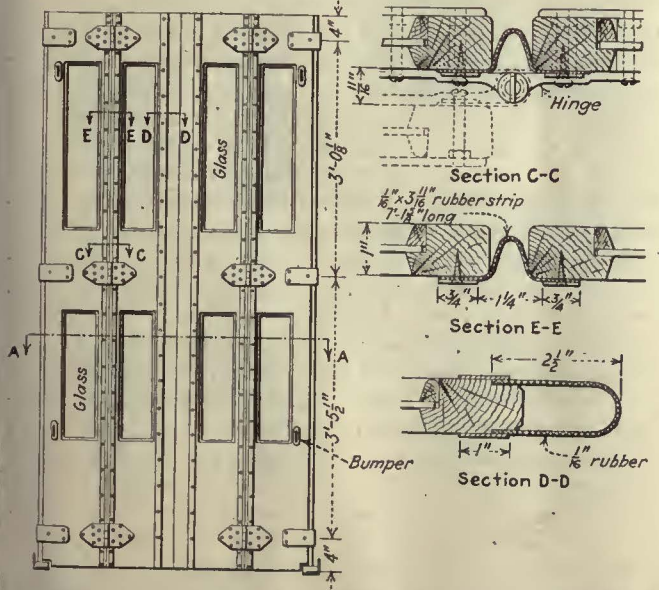
Elimination of the conventional foundation brake rigging permits a compact arrangement of equipment under the car. Air valves and miscellaneous parts are assembled in the air equipment box and may be readily removed from the car for inspection



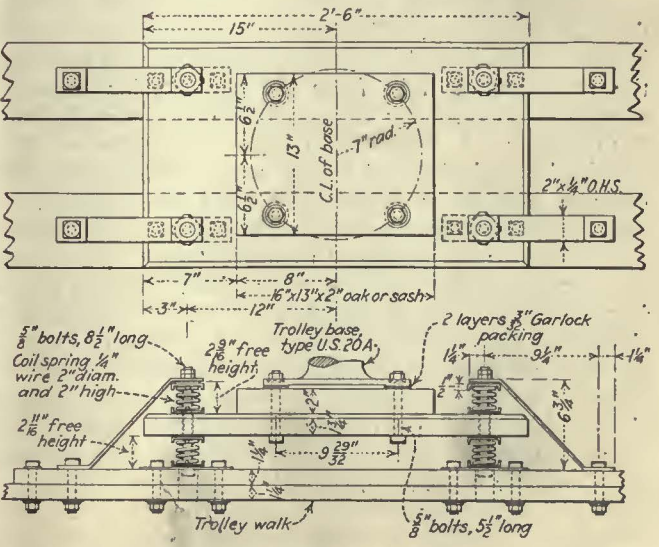
These bucket type seats developed for Pittsburgh are almost circular on the outside, to conserve space. The cushion is leather, while the back is faced with rattan



Section A-A



Precautions are taken to prevent folding doors from pinching passengers. Note particularly the arrangement at the hinged joints

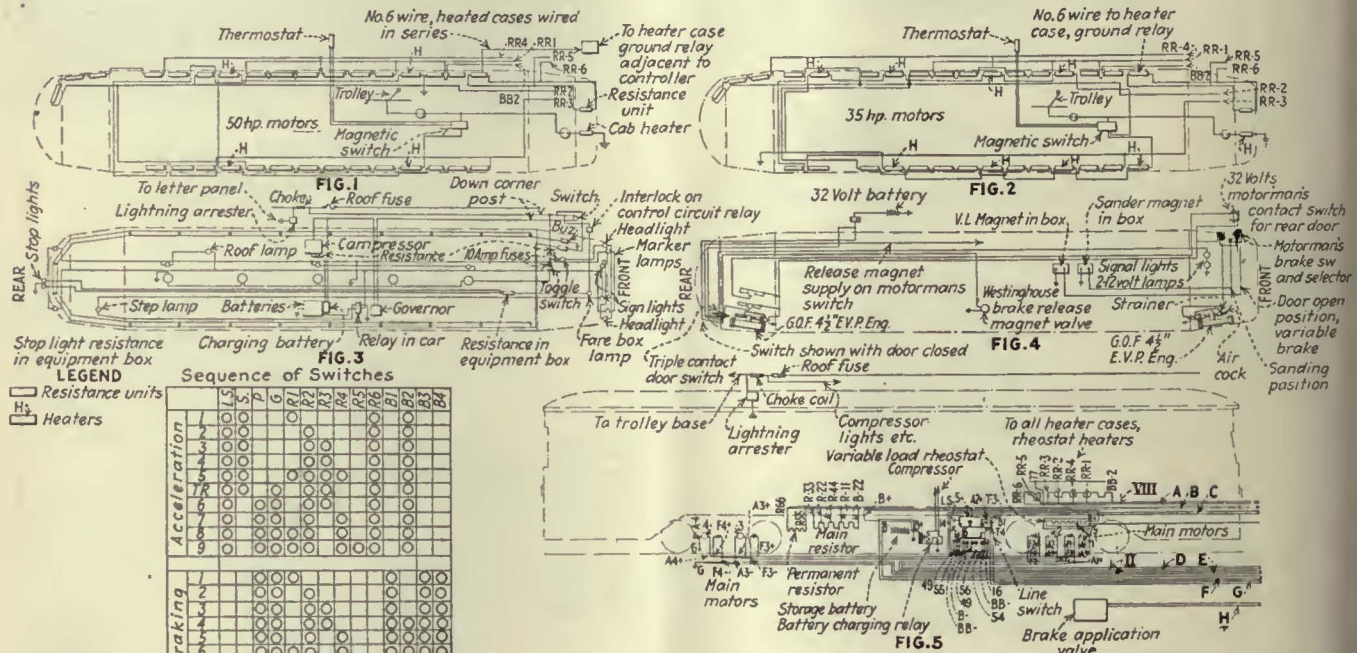


A special spring-mounted trolley base support reduces transmission of trolley noise to the body

tees, intermediate wood carlines being placed between them as indicated on accompanying drawings. The roof consists of tongue-and-groove poplar secured to the wood carlines and to the furrings on the steel carlines with cement-coated nails, and covered with No. 8 cotton duck. The eight wide windows on each side of the body, together with the windows in the rear vestibule, are of sashless, automobile type, of $\frac{3}{8}$ -in. plate glass, arranged to drop 10 in. from the top into suitable pockets in the body side. These windows are operated by special heavy-duty, Ternstedt regulators designed to handle glass of this size. Because of the weight of the glass a counter-balancing spring is arranged so that the windows may be

for ventilation. A simple operating mechanism on each side sash holds it securely in closed and open positions. A special weatherstrip arrangement is designed to preclude the entrance of wind or water at the sides or bottoms of these side sashes when they are closed.

Both the front entrance and the rear exit doors are double, inward folding, and are operated by National Pneumatic door equipment. They are controlled by a selector valve which permits either the front or rear doors to be opened or closed separately or simultaneously. In addition, the rear doors are controlled by an automatic exit treadle arranged in the conventional manner so that after the operator has thrown the selector handle to the



Control wiring and auxiliary circuits of the Pittsburgh experimental acceleration and automatic, regenerative, electric

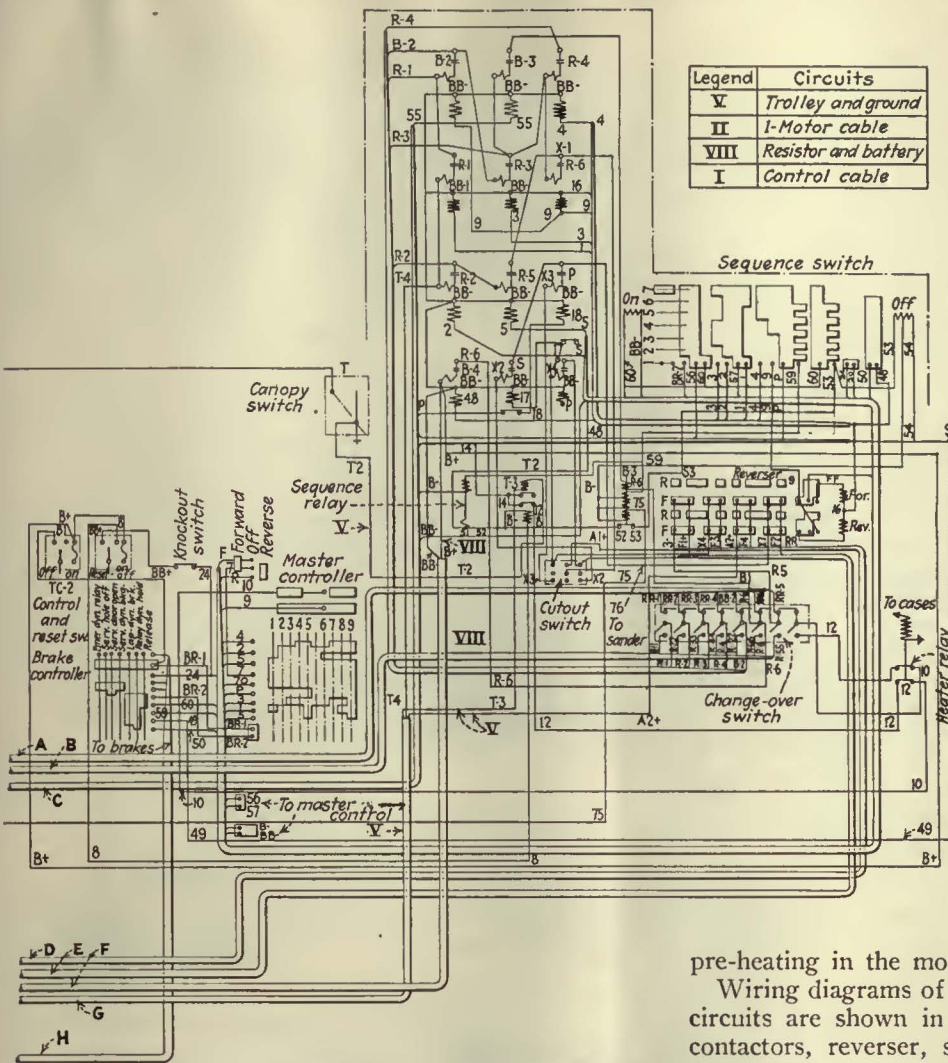
opened or closed with surprising ease by conventional automobile type operating handles. By this arrangement, window guards on the sides of the car, which were considered unsightly, costly to maintain and a nuisance in cleaning, are eliminated. Special drains are arranged in the pockets into which the side window glass drops, to carry off any water which might enter between the glass and the window sill. There are no side window curtains.

The front vestibule side window, opposite the entrance doors, is stationary. The front vestibule center window is also stationary and is set at an angle intended to deflect the reflection of light from the car interior so as to eliminate the need for the conventional curtain back of the operator. A Folberth air-operated window wiper is provided with inside and outside wipers to keep the glass clear of rain, snow or moisture from condensation. A sun visor is also provided over this window. An unusual arrangement was developed to prevent the formation of sleet or ice on the front center window. This is shown in an accompanying illustration. It consists of a slot in the top of the equipment cabinet and a deflector close to the dash, arranged so that heat from the vestibule heaters, mounted within the cabinet, is conducted upward against the sloping glass to prevent the formation of ice. The front vestibule side windows are framed in Curtain Supply Company brass sash, shaped to fit the space between the vestibule corner posts and the sloping front window. They are hinged at the vestibule corner posts by continuous piano hinges and are arranged to swing outwardly

proper position the rear doors will open only if a passenger is standing on the top treadle, or steps upon it, and cannot be closed until the passenger alights from the bottom treadle. The rear step treadles and the front steps are covered with Kass safety treads.

The sides of the body below the belt rail are insulated with three-ply Salamander felt, secured in place by means of nails electrically welded to the side sheets. This insulation performs the double function of preventing loss of heat in the winter and deadening the transmission of sound in the body. All the wood trim on the interior, as well as the vestibule doors, is selected mahogany, stained walnut color and finished with rubbed varnish. The headlining in the car body and vestibules is Agasote finished in cream-color Vitalite enamel. There are ten Osgood-Bradley Car Company exhaust ventilators in the roof, covered on the inside by grilles with adjustable lever-operated shutters. The car body is illuminated by five 101-watt lamps mounted in Electric Service Supplies Company special dome fixtures. These have integral automatic compensators which cut equivalent resistance into the circuit if one or more of the lamps burn out, so that the remaining lamps continue to burn at proper voltage. Double headlights furnished by the Electric Service Supplies Company are mounted on the front dash. At the rear end there is a Nichols-Lintern stop light.

A lamp is mounted over the entrance and exit steps,



mental cars. The control is semi-pneumatic, magnetic, with brakes in combination with electrically-controlled air brakes

and the front end destination sign is illuminated by two lamps located inside the sign box. An emergency system of lighting from a storage battery, which is part of the electric control equipment, is wired through a suitable relay to function in the event of a trolley dewirement or a power failure. These emergency lights are located in three of the body dome light fixtures and in the letterboards at each end of the car, where they are equipped with red semaphore lenses. One light on the roof is located near the main fuse, as an aid in replacing a fuse after dark. Passenger signal buzzers are Faraday type.

In the vestibule letterboard, above the center sash, there is an Electric Service Supplies Company illuminated destination sign with 10x41-in. sign openings. Extending out from the dash at each end there is mounted a heavy C. & G. Spring & Bumper Company automobile type spring bumper. This is designed so that it will spring back toward the dash in the event of a car collision and will permit the drawhead to project through and act as an anti-climber.

One of the cars, mounted on Timken trucks, is equipped with four Westinghouse No. 1425 motors of 35 hp., geared 10:1 in the worm drive. These trucks have 26-in. diameter wheels. The motors are wound for 300 volts, and are permanently connected in series in groups of two. On level tangent track with a trolley voltage of 600, this car without load will balance at a free running speed of

approximately 33 m.p.h. The motor weight is 545 lb. and the maximum safe motor speed is 5,000 r.p.m. at 38.7 m.p.h. car speed.

The control apparatus consists of a master controller, magnetic contactors, pneumatic reverser, sequence switch and edge wound resistors mounted inside the car to utilize for car heating the resistance losses during acceleration and dynamic braking. A second set of control resistances is mounted under the car for use in summer, and a change-over switch is provided so that the control circuit may be shifted from the inside to the outside resistances when seasonal changes make this necessary. Supplementary Railway Utility truss plank car heaters are connected to a thermostat on the interior of the car, so that they are cut in automatically whenever, in severe weather, the heat supplied by the control resistances is not sufficient to keep the car at a predetermined temperature.

They are also available for pre-heating in the morning before cars go into service.

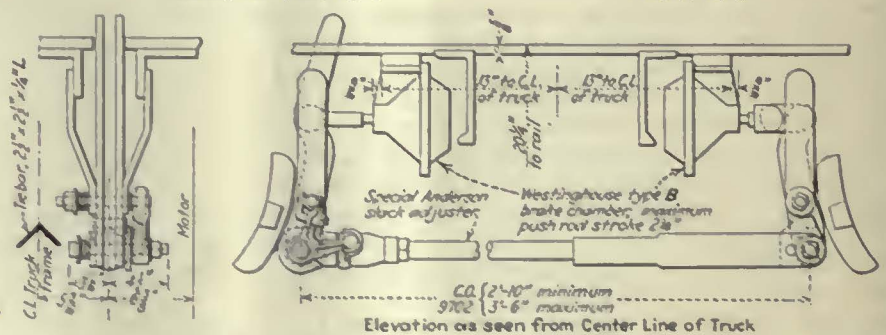
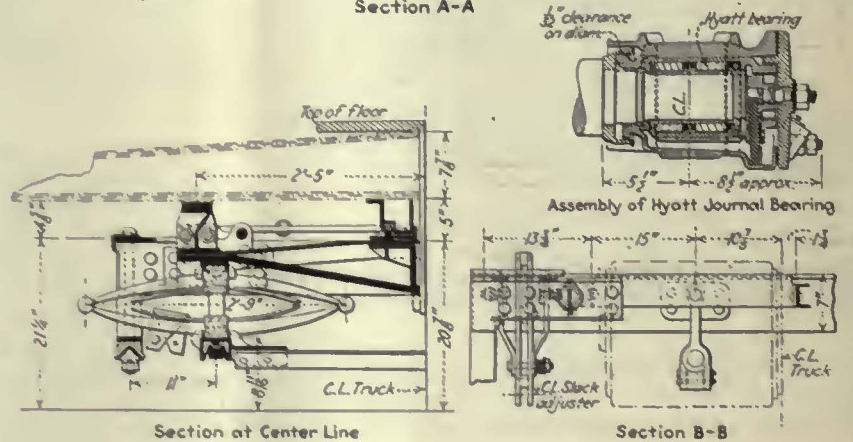
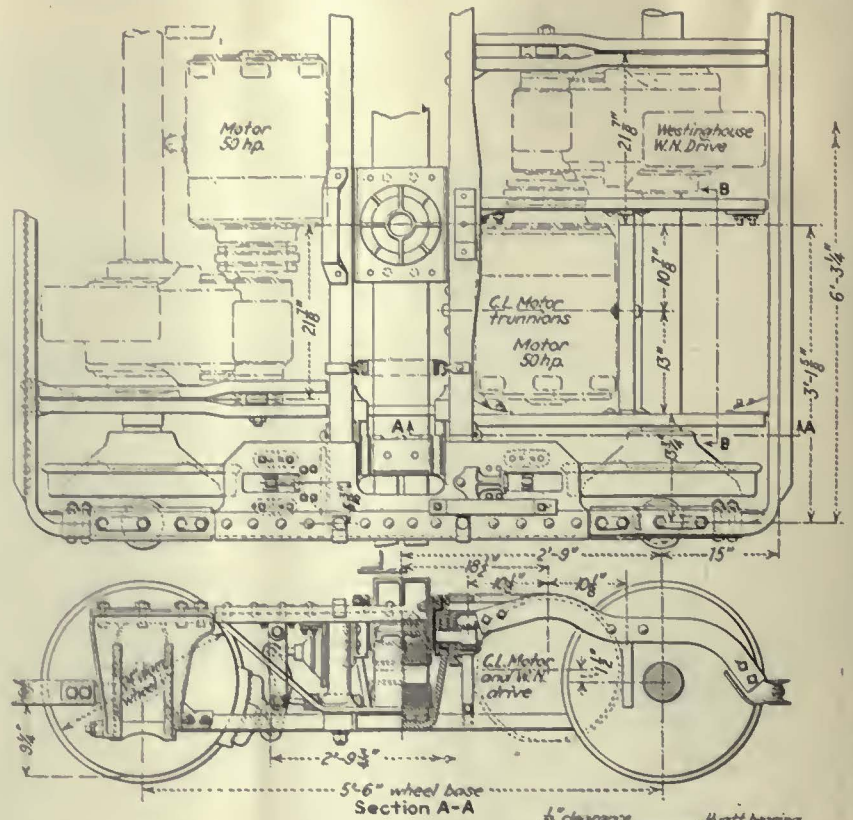
Wiring diagrams of the control and auxiliary electrical circuits are shown in accompanying illustrations. The contactors, reverser, sequence switch, and other apparatus of the control equipment, are mounted in suitable cabinets on the left side of the front vestibule. These cabinets are made shallow in depth so as not to interfere with the view from the car interior toward the front. The cabinets are of wood, heavily insulated with asbestos lining, and are provided with large doors so that the equipment is readily accessible for inspection. The line switch is mounted underneath the car. All switches and other vestibule equipment are enclosed in cabinets in the front vestibule, as shown in the accompanying illustrations. The only exposed items are the wheel of the Peacock staffless hand brake, the dynamic brake handle and the top portion of the controller. An Economy meter is mounted inside the control cabinet near the entrance door in such a way that the dial is exposed for convenient reading, either from the platform or from outside the car.

The application of power to the car is by straight hand notching. The dynamic brake is applied automatically under the operator's control at the air brake handle. The dynamic braking positions on the segment of this control handle, correspond to the usual air brake positions on the conventional motorman's brake valve. Dynamic brake application is made by manipulation of the control handle very similar to a conventional straight air brake equipment. By moving the handle of this dual brake control to the right, beyond what would normally correspond to brake lap position, the air brake becomes operative. In fact, the dynamic and air brake arcs lap into each other so that there is a gradual transition from the electric to the air brake.

Arrangement of equipment under the car is shown in an accompanying drawing. An unusual feature of arrangement is that the compressor governor, brake application valves, relay valves and other air brake equipment are grouped in a special box with a removable bottom and a heating unit to prevent freezing. By disconnecting the pipe lines leading into the box, at the unions, and the wiring at special connectors provided, all of the valves may be removed in a group for inspection, cleaning or repair. Air brake piping, with the exception of a small amount of standard iron piping at special locations, consists of aluminum tubing in various sizes, fitted at valves and other junctions to apparatus with special, long taper, automotive type, couplings. The use of the aluminum tubing not only reduces weight but simplifies installation, since it is flexible enough to be bent into position without the use of elbows or other pipe fittings. Further advantages expected from the use of this material are the elimination of pockets, freer flow of air through the long bends, and the elimination of trouble from scale and rust.

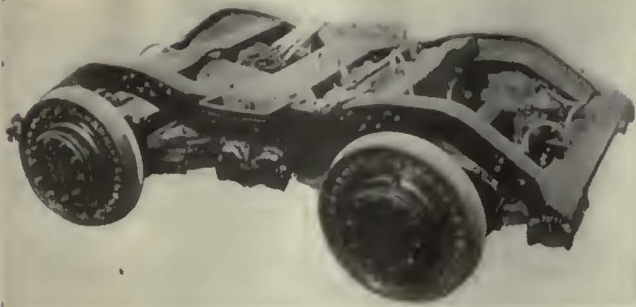
The Timken trucks are similar to the type developed for the experimental cars in Springfield, Mass., and Joliet, Ill., and subsequently applied in experimental installations in a number of cities during the past year. The second car is mounted on special Osgood-Bradley trucks, type 45-66-KDA-50, equipped with 50-hp., Westinghouse No. 1426 motors, geared 7.06:1 and driving 24-in. diameter wheels through W-N (double reduction) gear units. These trucks are of the Osgood-Bradley conventional truss frame, spring pedestal type, equipped with Hyatt journal bearings. Aside from modifications to permit mounting of the high-speed motors and the W-N drive, the principal feature of interest in the truck design is the brake arrangement. The brake itself is applied through conventional cast-iron shoes on the wheels. Instead of the customary brake cylinder and foundation rigging, however, Westinghouse diaphragm automotive-type brake chambers are mounted on the truck, one at each wheel. The push rod of each chamber actuates the corresponding brake lever directly through a specially designed Anderson automatic slack adjuster. General arrangement of the truck and brake rigging is shown in an accompanying drawing.

Except for the fact that the Westinghouse 1426 motors on this car are of 50-hp. capacity instead of 35, they are quite similar in design to the No. 1425 motors on the car equipped with Timken trucks. They are wound for



By using Westinghouse automotive brake diaphragms mounted at each wheel, a unique brake arrangement was developed for the Osgood-Bradley trucks used under one of the cars. The motor drive on this truck is through W-N, double-reduction type gearing. The other car is mounted on Timken trucks with worm drive

300 volts and are connected permanently in series in pairs. With four of these motors per car, unusually high accelerating rates are possible. Under the same conditions as given above for the 1425 equipment, the balancing speed is 38 m.p.h. The weight of each motor is 800 lb. and the maximum safe speed of 4,000 r.p.m. corresponds to a car speed of 44 m.p.h.



The Timken worm drive trucks used under one of the Pittsburgh cars are equipped with 35-hp. motors and automotive type spring mounting

The W-N drive unit is carried on the truck frame in special yokes designed to avoid twisting on the short drive shaft between the motor and the gear unit. The high speed and intermediate shafts are carried on Timken tapered bearings at each end, and the low-speed gear is carried on a sleeve mounted on Timken bearings. The car axle is pressed into the sleeve in the same manner as it is ordinarily pressed into the gear of a conventional single-reduction drive. The gears and pinions are cut with high-angle helical teeth designed to reduce noise to a minimum. The gears are also silenced to prevent ringing at high speed.

A variable load brake device is part of the equipment of each car. Another interesting feature, shown in an accompanying illustration, is the special spring-mounted trolley base support which is intended to reduce drumming inside the car from the action of the trolley wheel on the wire and overhead special work. This trolley support was designed by the Pittsburgh Railways and is used on a number of other cars in regular service on the line of the company.

Large Electric Locomotives for France

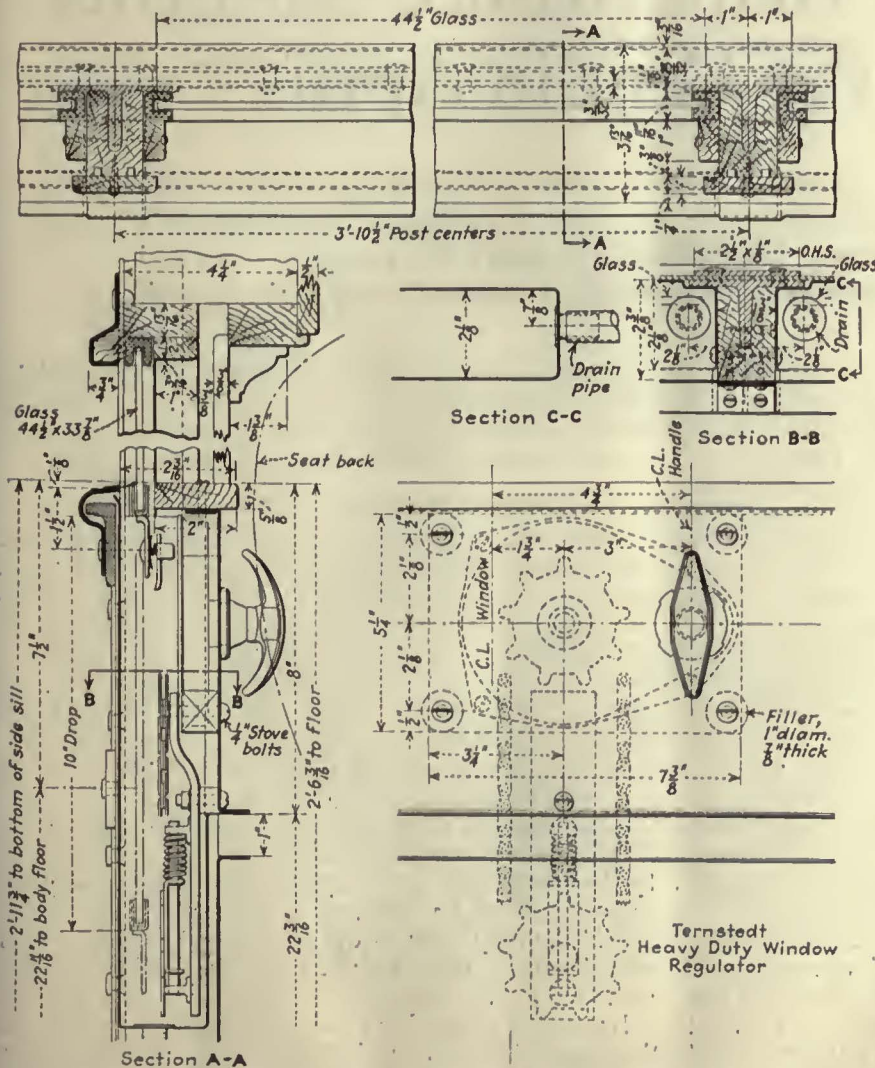
FOUR large d.c. express locomotives have been ordered by the Paris, Lyons & Mediterranean Railway. These rank among the most powerful single locomotives ever built. On the one-hour rating they develop 5,400 hp. The contract for their electrical equipment was placed with the Société Oerlikon, Paris, while the mechanical part is being supplied by the Société de Construction des Batignolles.

It may be recalled that, in 1925, the P.L.M. Railway began a trial service on a relatively short section of the line approaching the Mount Cenis Tunnel, to collect data with regard to the most suitable type of electric express locomotive, before proceeding with the electrification of its system on a large scale. Four locomotives were ordered, two being of the 2BB2 type, with individual drive. While the results obtained with this drive were good, the investigations showed that it was advisable to have a considerably higher output than in the case of the trial locomotive. In view of this, the number of driving axles had to be increased, and the output per driving axle raised.

FRAMES ARE ARTICULATED

The locomotives now in the course of construction are of the 2CC2 type, with close-coupled trucks and a long locomotive body. They are provided with the Oerlikon individual drive, each of the six driving axles being driven by a twin motor. With a voltage of 1,350 on overhead line, these motors develop 800 hp. each at 45 m.p.h., while with the full voltage of 1,500 volts, the one-hour rating is 900 hp. per motor or 5,400 hp. for the locomotive. The output in each case is measured at wheel periphery. This is claimed by the manufacturers to be in excess of any locomotive output up to the present time. The permissible weight per axle is 18 tons and the maximum speed is 80 m.p.h.

The total weight of locomotive is 153 tons, so that the weight per hp. in the case of the one-hour rating is 63.5 lb. This figure is said by the manufacturers to be a low record as regards weight per horsepower. The length of the locomotive over buffers is 78 ft.



This enlarged section through the body side shows the plate glass automotive window construction and the heavy-duty Ternstedt operating mechanism



Representatives of the safety patrols of the public and parochial schools were greeted by Mayor Mackey and Ralph T. Senter, president of P.R.T., and were presented with flags as a reward for their work during Child Safety Week

Safety Drive Helps Reduce Accidents 26.9 Per Cent in April

Philadelphia Rapid Transit System takes active part in state-wide "Safety—Save a Life" campaign as part of Mitten Management's aggressive safety measures. More than 250 safety talks given. No fatal accidents on P.R.T. street car and high speed system during entire month

DURING the past April a state-wide safety drive in Pennsylvania was launched in response to a proclamation issued by Governor Fisher. Since Philadelphia is the largest community in Pennsylvania, it naturally became the scene of the most widespread activity in the accident prevention campaign. Because of the vital importance of the subject of street safety to a transportation company, and because of the emphasis which Mitten Management places on this phase of operation, the Philadelphia Rapid Transit Company was one of the most active participants in the local activities of the state-wide Safety—Save a Life campaign. In the Will Livelong campaign in April of the year previous P.R.T. had been the guiding spirit; had practically financed the carrying on of the month-long safety work, but had invited all other interested organizations and bodies in the city to co-operate and had shared with these other bodies the credit for speeding and executing the safety activities and in bringing about the very material reduction in street casualties which was effected during the month.

This year, while being merely one of the many organizations and groups participating in the Governor's campaign, the company nevertheless threw its resources into the undertaking without reserve. It appropriated several thousand dollars to carry on its share of the work and many of its officials and employees contributed their

services as safety speakers in the schools and before clubs, civic organizations, etc. The publicity and advertising department devoted many hours to the preparation of safety literature, stories, speeches, debates and plays.

COMPANY ACTIVITIES ALONG TWO LINES

The activities of the transit organization were concentrated along two specific lines. In the first place, intensive efforts were made to put over the safety idea within the organization itself. It was desired to show a material reduction in street car, bus and taxicab accidents under the very good record established in April, 1927. In addition, the company devoted considerable money to the preparation and display of dash, bulkhead and ceiling-rack signs calculated to catch the public eye and to center attention upon the accident hazards of the street.

Excepting the work carried on inside the organization itself, however, the most outstanding contribution made by the company to the safety campaign was probably the organization of an emergency speakers' bureau which provided safety talks in the schools and before various organizations. More than 250 such speeches were delivered by P.R.T. representatives during the two final weeks.

Immediate results from the April campaign throughout the state and in the city of Philadelphia were not as great as might have been anticipated. Judging from the effect

THE GUEST OF HONOR



Are you sitting at this banquet?

14,305 Highway Accidents in Philadelphia in 1927

Most of these were needless—
Failure to think caused them

JOIN THE UPRISING AGAINST CARELESSNESS

Safety, Save-a-life

PRR Co-operating

ONLY ONE RIGHT WAY TO CROSS THE STREET
Safety-Save-a-life PRR Co-operating

The Traffic Officer is Your Safety Specialist
Obey him, and he can prevent accidents
Safety - Save a life - PRT Co-operating

I AM CAREFUL
Safety-Save a Life PRR Co-operating

Watch for Children
Safety-Save-a-life PRR Co-operating

THE CHILDRENS' SAFETY PLEDGE
applies to grown-ups too
Safety-Save-a-life PRR Co-operating

Join Our Uprising Against Carelessness
Safety-Save a life-PRT Co-operating

Follow the White Line
Cross at Crossings
Safety-Save a life PRR Co-operating

SAFETY
Save a life

Yellow Cab Co-operating

Safety
Save a life
PRR Co-operating

P. R. T. Co-operator



Vol. 8, No. 8

April 28

The cartoon entitled "The Guest of Honor" was enlarged for a window poster and more than 2,000 distributed to stores, schools and clubs.

get well started until about a week later. Thus the actual working period was only about three weeks. During the Will Livelong campaign, which lasted for the entire month of April of last year, it was noted that the mounting toll of these accidents was not checked until well into the third week of the campaign. After that the curve showed a distinct falling off. It is quite possible that the Safety—Save a Life campaign would

have shown a similar effect had it continued a week or two longer. It is significant that Philadelphia was the only large American city to show a decrease in its accident death rate during the year 1927. This is an indication that the safety educational work which is being carried on in that city has a cumulative effect and the emphasis given to it by occasional campaigns, such as this latest one, undoubtedly has a salutary effect.

Considering more particularly the individual work of the Philadelphia Rapid Transit Company during this campaign it is worthy of note that a distinct checking of its own accident toll resulted from the work carried on inside of the transit organization. A new safety record was established during the month of April, no fatal accidents occurring on the P.R.T. street car and high speed system throughout that period. The results obtained in April, 1927, during the Will Livelong cam-

Posters and cartoons with safety messages were widely distributed during the campaign.

of the Will Livelong campaign in 1927, when a decrease of 20 per cent in street fatalities was accomplished in Philadelphia, it had been hoped by those who conceived and directed the present state-wide drive that a similarly encouraging result might be obtained this year. Actually street accidents in both city and state during the period of the recent campaign, as compared with a similar period in 1927, showed an increase. The same was true of deaths resulting from highway accidents.

The explanation of the rather anomalous situation perhaps lies in the fact that a state-wide movement of any kind is of necessity cumbersome. It proved a very real problem to co-ordinate the work in various sections of the state and, to a lesser degree, in Philadelphia proper. No single organization was responsible for carrying on the unified campaign.

The Will Livelong campaign in April, 1927, had more immediate and more far reaching results, probably because it was a purely local effort; because it was financed and directed largely by a single organization and because it had a very personal and direct appeal to the individual citizen through the existence of the central character of Will Livelong, the Safety Sage.

While the Safety—Save a Life campaign officially opened on April 1, the activities in Philadelphia did not



Philadelphia newspapers devoted much space to the safety campaign. The activity of the Philadelphia Rapid Transit Company in the campaign is well noted in these typical clippings

campaign, were noticeable and they constituted a real mark at which to shoot. The period from April 8 to 28, inclusive, showed a reduction in all types of accidents over a similar period in 1927 of 26.9 per cent. This figure includes street car, bus, cab and elevated divisions. This record compares favorably with the per cent reduction accomplished during April, 1927, since it is naturally more difficult to better a record that is already good.

The various organizations in the city which co-operated in the Safety—Save a Life campaign included the Citizens' Safety Committee of the Chamber of Commerce, the Automobile Club of Philadelphia, the Keystone Automobile Club, the public and parochial schools, the department of public safety, the transit organization, and other civic bodies. Each assumed responsibility for a certain field of activities.

WHAT P.R.T. DID WITHIN ITS OWN ORGANIZATION

The activities of P.R.T. during the campaign might be roughly classified as (1) those carried on within its own organization and (2) those which dealt with giving publicity to the matter of street safety on its cars and buses and through its speakers' bureau. The company accepted a commission from the Governor as official inspection station No. 1 for the inspecting of all types of vehicles used in street operation. A large number of these stations were established throughout the state, particularly in the various public garages. The one conducted by P.R.T. limited its activities to the inspection and certifying of company vehicles only. Every street car, elevated car, bus, cab, and truck operated as a part of the P.R.T. system carried the official seal of the State Department of Highways during the month of April. This indicated that its brakes and general equipment were in a satisfactory condition.

Accident clock dials were placed in each location of the

company, showing its daily standing and the standing of the campaign to date as compared with similar periods during 1927. One of the hands was painted red and the other hand black and conscientious efforts were made by the employees to keep the hand representing the 1928 standing behind that one representing the standing for 1927. A special issue of the PRT Co-operator, containing a large and varied array of safety propaganda, was distributed to the 15,000 employees about the middle of the campaign.

Safety posters were widely utilized on the company bulletin boards, a special safety message from President R. T. Senter was enclosed in the pay envelope of every employee early in the campaign, the employee committeemen representing the transportation locations were assembled in a preliminary meeting and urged to spread the gospel of safety among their constituents; in short, every possible step was taken to get the idea of safety firmly implanted in the minds of all employees charged with the operation of vehicles.

Large cloth banners were placed in the various carhouses, garages, and other locations, bearing the slogan "Safety—Save a Life, PRT Co-operating." Similar banners were displayed on water tanks, building fronts, and other prominent vantage points over the system. These attracted considerable attention, both inside of the organization and out.

The spirit of friendly rivalry between various individual carhouses, bus garages, cab garages, etc., led to many "zero" days for various locations—days in which no accidents of any sort were charged against employees from those locations. One heavy downtown route, for example, has operated recently for a period of 332 days without a car collision. These local records are jealously guarded by representatives of the particular location involved.

The week of April 8 to 14 was used as an introductory period in which dash signs bearing the legend "Safety—Save a Life—PRT Co-operating" appeared on the 3,500 cars and buses operating on the streets of Philadelphia. Various safety bulkhead and ceiling-rack signs and cab cards were used inside the vehicles. Considerable newspaper publicity was given to the proposed activities of the transit organization during the balance of the safety month.

From the standpoint of the community welfare as a whole, it is probable that the single activity of P.R.T. which accomplished the greatest good was the operation of its speakers' bureau. There are somewhat more than 300 public and parochial schools in the city of Philadelphia. The company sent representatives into about 175 of these schools, giving more than 250 talks. The Automobile Club of Philadelphia and the Keystone Automobile Club also did good work in sending speakers into the schools, although neither of these organizations went into this activity to a degree equaling that of the transit system. A large majority of the school children in the city, of proper age to assimilate safety instruction readily, were reached by these speakers. The week of April 15 to 21 was designated officially as Children's Safety Week and during it a majority of the safety talks in the schools were delivered. The P.R.T. speakers, in particular, stressed the importance of forming proper safety habits while children, since habits are obeyed instinctively, and the habits of safe procedure while on the street are therefore most important.

It had originally been intended to handle the speaking work in the schools with the membership of the public speaking class conducted for P.R.T. employees. However, the requests for safety speakers were so great and such a majority of the requests were for speakers to appear before 9 o'clock assemblies, that it was utterly impossible to fill all engagements with the limited membership of the public speaking class. Therefore, additional employees and company officials were called upon, so that eventually a corps of more than 40 speakers was assembled.

The speakers had at their disposal safety charts and pictures illustrating various types of child accidents, as well as a supply of safety rules for children, pedestrians and autoists, these being distributed in all schools where P.R.T. speakers entered.

Safety stories, plays, recitations, debates and similar material were prepared and sent broadcast to the principals of all the public and parochial schools for whatever use they might desire to make of them. More than 350,000 membership buttons in the "I Cross at Crossings Club" were made and distributed to all school children in the city. President Senter of P.R.T. presented the first of these membership buttons to representatives of the public and parochial schools at the beginning of Children's Safety Week and most of the city newspapers had photographers on hand to record this event.

At the close of Children's Safety Week safety patrol flags were presented to representatives of the public school and parochial school safety



Large cloth banners bearing the slogan, "Safety—Save a Life—P.R.T. Co-operating," were prominently displayed at many points on the system

patrols by the Philadelphia Rapid Transit Company and silk American flags of the same size were presented to these representatives by the Automobile Club of Philadelphia. This presentation was held in the Mayor's office at City Hall, the flags being first presented to Mayor Harry A. Mackey, who in turn gave them to the boys. This pleasant ceremony was preceded by drills of crack safety patrols in the downtown section of the city. The P.R.T. Kiltie Band provided suitable music.

This work with the children has proved doubly satisfactory. In the first place, it is apt to be more effective and more permanent in nature with the young people than with adults. In the second place, the good-will established between the company and the children, as well as the parents of the children, is of no small value. The transit corporation is revealed as a very human and friendly organization, instead of a cold-blooded thing of business.

An additional safety activity fostered in the schools by the company during the campaign was the holding of



P.R.T.'s booth at the Philadelphia Auto Show. Safety literature was distributed here and the part played by the transit organization emphasized with posters



• One of the billboard posters, acquainting the public with the safety drive

a safety poster drawing contest among the children in the art classes. This contest was inaugurated during Childrens' Week and was to continue for a period of one month. P.R.T. offered, as prizes for the best safety posters submitted, memberships in the Circulating Picture Club of the Philadelphia Art Alliance. These memberships went to the schools from which the winning posters came, rather than to the individual pupils. In this way a school from which a winning poster was chosen is entitled to receive twelve fine paintings during the course of the ensuing year, each painting to remain in the school for a period of one month. This arrangement was to comply with the regulation of the Philadelphia Public Schools, which states that no individual prizes may be given to school children for any contest held in the schools.

The safety cartoon entitled "The Guest of Honor," which first appeared in the special safety issue of *PRT Co-operator*, attracted so much attention that it was later reproduced on a large scale as the central theme of a window poster. P.R.T. car and bus supervisors distributed more than 2,000 of these posters to the stores and community shops. A large number were also sent to various schools and clubs.

Letters were sent to every club in the city, asking that



A safety poster drawing contest was fostered among children in art classes. Here are four of the stencil posters submitted

the safety campaign be supported by resolutions, by the posting of safety pictures on the club bulletin boards, and by the provision of speaking opportunities for a safety speaker either from the club's membership or from the P.R.T. speakers' bureau. Many of the clubs responded to this appeal in one or more of the ways suggested.

This was practically the only other outside safety campaign activity carried on by the transit organization besides those already mentioned. The work was concentrated upon a few specific functions rather than being spread out over every field of safety activity.

In this way it was possible to handle the transit system's part in the campaign this year with a smaller budget than was required for the Will Livelong campaign. Yet the result obtained within the organization and among the school children would seem to indicate that fully as much benefit was derived from the safety work during this past April as from that during last year's campaign.

As a windup to the activities carried on among the children, the annual Boys' Week Parade was staged on May 5, being postponed from April 28 because of bad weather. Representatives of the safety patrols marched in the parade, carrying safety banners and wearing caps provided by P.R.T. for the occasion. The 110-piece prize-winning band of the transit organization took part.

So far as the transportation system was concerned the April campaign was but a passing phase in the year-round schedule of safety work. "Bigger and better zero days" are what the entire organization is shooting for now.



Daily standings for each transportation location were shown by accident clock dials

Cross-Seats for 200 Detroit Trailers



Longitudinal seats have been replaced by leather upholstered cross-seats in this Detroit trail car

LEATHER upholstered cross-seats have been installed in place of the old cane upholstered longitudinal seats in one of the trail cars of the Department of Street Railways, Detroit, Mich. The change was made at low cost by reclaiming a number of seats from dismantled cars and re-upholstering them in leather. Work has been started on a similar conversion of about 200 more trailers.

Levis Tramways Increases Revenue with Weekly Pass

Careful adjustment of the fare schedule is necessary to insure success. Cash fare and the ticket rate must bear certain relation with the cost of the pass

By H. E. Weyman

Manager Levis Tramways Company, Levis, Quebec, Canada



At left—Dating the weekly passes with a reciprocating stamper. At right—Stitching the passes together in pads

DECREASES of traffic and revenue during the first four months of 1925 caused the Levis Tramways, Levis, Quebec, Canada, to install the weekly pass. The company had studied the pass system carefully and was ready to adopt it when circumstances proved that something should be done to stimulate traffic and to counteract the effect of the private automobile. The railway system is a suburban one with terminal loading and unloading at the Quebec Ferry, and therefore not a particularly favorable one on which to use a weekly pass. The management, however, decided that with careful adjustment of rates of fare it could be made to pay, and consequently adopted it.

At first a \$1 pass was used with the cash fare of 10 cents and the ticket fare of four for 30 cents on the two single-zone routes within Levis. The sales of the first four weeks were about 15 per cent of the total revenue. In the week of July 12, 1925, the same pass was made effective in the first or Levis zone of the third route, the one extending to the Quebec Bridge. The sales

immediately increased 24 per cent. It was gratifying to learn that satisfied patrons were telling others of the new system and to such an extent that riders in the second zone were soon asking for a pass.

EFFECT OF TICKET COMBINATIONS ON WEEKLY PASS

The request from the second-zone or St. Romuald riders for a pass offered the opportunity to make a bargain. The public wanted a weekly pass and the company wanted to sell strips of tickets that would not be too easy for a casual rider to obtain. The company arranged with the municipal authorities for the sale of six tickets for 45 cents instead of four for 30 cents, the public agreeing to this alteration in exchange for a \$1.75 pass to go into effect in November, 1925. The first week's sale of the new pass was only 42, but in a short time the number more than doubled. Also the number of cash fares of 10 cents per zone increased 30 per cent during the first week, a most gratifying increase. This experience proved convincingly that the most profitable use of a weekly pass

TABLE I—DISTRIBUTION OF PASSENGERS ACCORDING TO FARE USED, IN PER CENT

	1924	1925 (Pass Used Seven Mos.)	1926	1927	1928 (Three Months)
Cash.....	13.3	11.5	13.3	13.0	11.2
Tickets.....	86.7	68.4	48.4	44.6	42.0
Passes.....	.....	20.1	38.3	42.4	46.8

occurs when the ticket is not made too accessible for those who are really casual riders on the one hand or who might be regular riders with the pass on the other hand.

It may not seem that 45 per cent is a large enough investment to deter fairly good riders from using tickets, especially when the tickets are sold on the cars. Yet it is a fact that tickets in strips of six or eight tend to make the regular rider a better and more profitable one by using the convenient pass, while casual riders accept the dime cash fare to avoid bother.

The results in Levis demonstrate how much care must be exercised in arranging cash and ticket rates to work with the pass. The cash fare and the ticket rate must bear certain relations with the pass or the best results will not be obtained. Quite often one sees a property putting a weekly pass into effect with no consideration for the remaining fare scale. As a result the pass is usually a failure.

RATIO OF PASS REVENUE TO TOTAL RISES

The opening sale of the first or \$1 pass was 250. This same pass, with no change in privileges, attained a sale of 718 in the week of March 18, 1928. In like manner the two-zone or \$1.75 pass has advanced from 42 to a winter sale averaging 90 and a summer sale as high as 130. The outstanding fact is that revenue from prepaid users of the pass has risen from 15 to 26 per cent of the total revenue.

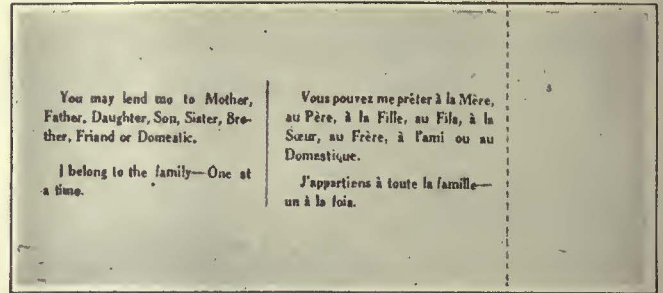
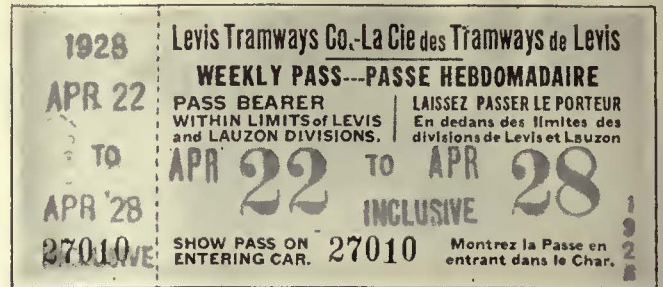
The accompanying graphs show the revenue received from cash fares, tickets and passes. It will be noted that cash fares showed an immediate increase as soon as the sale of tickets in strips of six replaced the sale of tickets in strips of four. The increase has continually been in evidence since the change. The revenue from tickets sold shows a decline due to the pass. This decline indicates that the ticket rider has been converted to a pass owner, paying more than he did for the tickets but enjoying more convenience. The revenue from passes varies from month to month, as some months are credited with five weeks and others only four. However, the gradual increase in the sale is well demonstrated.

Transferability of the pass has caused no loss of cash fares that might have been paid otherwise by members of the pass holder's family. Cash fares increased from 295,851 in 1926 to 324,781 in 1927 at the very time that the tickets decreased from 1,078,301 to 1,065,182. The pass and cash sales tend to advance at the same time because pass holders prefer to pay the dime fare to purchasing six tickets for 45 cents.

When the weekly pass was first mentioned the com-

TABLE II—DISTRIBUTION OF TOTAL REVENUE WITH RESPECT TO TYPE OF FARE, IN PER CENT

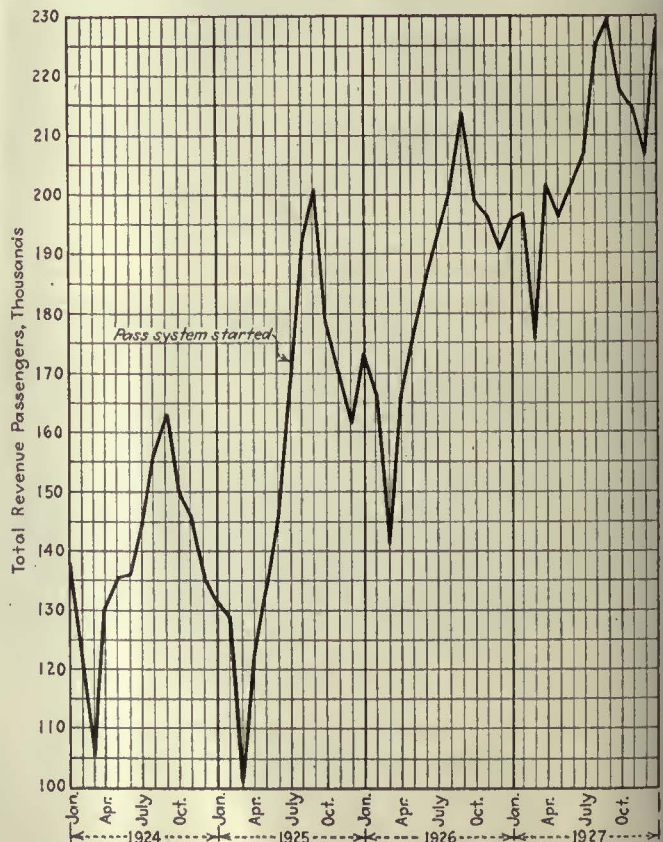
	1924	1925 (Pass Used Seven Mos.)	1926	1927	1928 (Three Months)
Cash.....	17.8	17.4	22.3	22.8	20.3
Tickets.....	82.2	73.0	56.9	51.5	51.8
Passes.....	.....	9.6	20.8	25.7	27.9



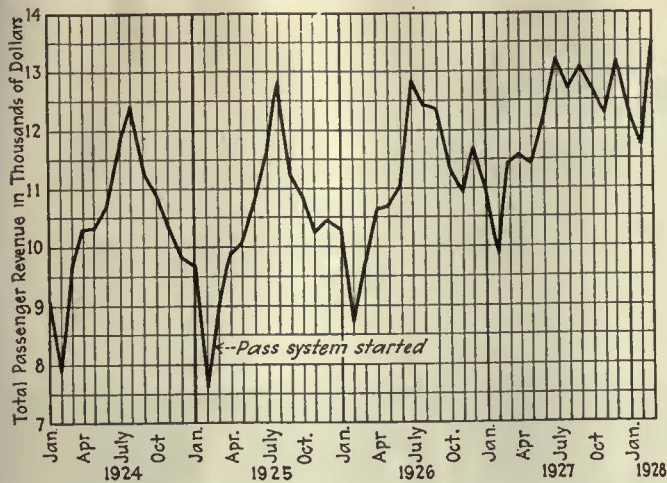
At top—Face of one of the printed weekly passes used by the Levis Tramways. At bottom—Reverse side of the same pass showing one of the slogans used

pany actually feared it. The many possibilities of misuse and the thought that increased car service would be required to take care of the pass riders caused an unfavorable reaction toward its adoption. However, it was felt that the pass would be worth while in making fare collections more convenient for both operators and patrons, and that it would serve as a good will measure.

Experience with the pass showed that there was a very definite limit to the number of rides that pass holders



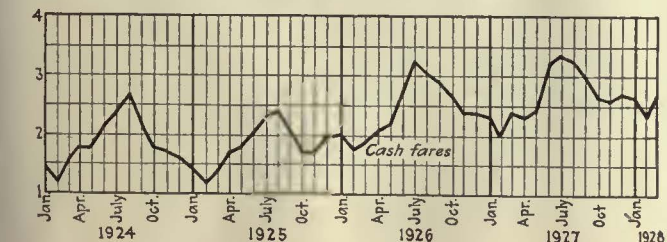
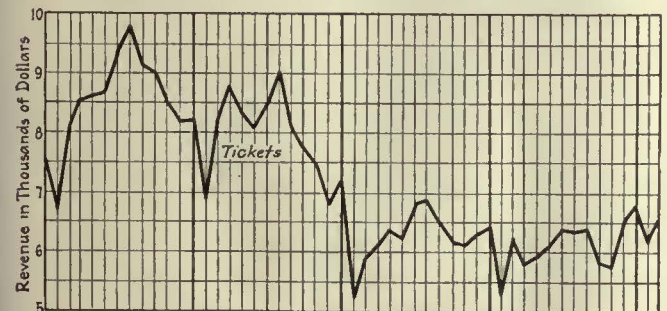
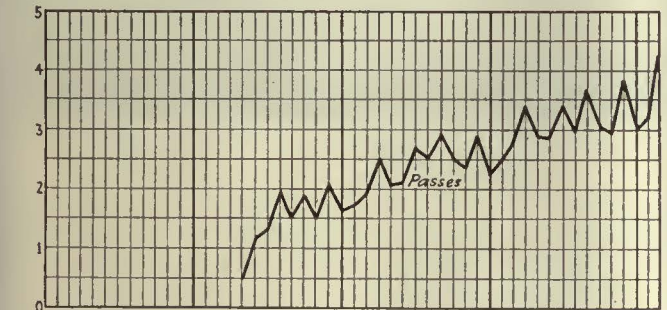
Total passengers by months for the years 1924 to 1927, inclusive. The total has climbed steadily since the introduction of the weekly pass



Total revenue by months for the period from January, 1924, to February, 1928, inclusive. It is significant that the pass has caused a large increase in revenue as well as in number of passengers carried

averaged despite the theoretical unlimited service. An average of about 2½ through rides a day has been maintained practically since the start. To avoid possible abuse of the pass the following was printed on the front of each one:

Pass must be shown to car operators and inspectors upon entering car and is good for only one passenger on any given trip and must remain in possession of passenger during trip. Any attempt to misuse pass renders it void. Company reserves the right to cancel the pass system at any time.



Revenue by months for the period from January, 1924, to February, 1928, inclusive, from passes, tickets and cash fares. While revenue from tickets has declined the revenue from both passes and cash fares has increased

On the back of the passes the following information was printed:

The issue of this pass constitutes an attempt by this company to provide a method whereby the general public can obtain cheap fares. In other words, it is an attempt to sell "transportation at wholesale rates." Any person attempting to illegally use this pass in any way will be arrested for fraud.

Prosecution of the few persons who did misuse the pass soon put an end to the practice. The public approved of this policy for it appreciated that the pass was instituted for its benefit.

CHEAPER PAPER NOW USED FOR PASSES

Bearing on the question of fraud with the pass, a simpler and cheaper pass is now used. The original card showed all the months of the year and had date spaces, so that it could be punched to show the week of use. The simple printed pass, shown in one of the accompanying illustrations, is now used. The tickets are printed in large quantities with blank spaces for the date. They are of different colors and have serial numbers. Previous to any week's sale the passes are dated with a reciprocating stamper. The passes are then put up in pads of five, ten or fifteen, with a stub carrying the printed serial number and the stamped date. The machines for dating and binding the passes are also illustrated. The backs of the passes are used for company publicity and bear advertising slogans.

The success of the pass plan, perhaps, may be credited to the whole-hearted manner in which the system was put into effect. Every channel of salesmanship and publicity that was suggested or could be thought of was used, and as a result every prospective buyer of the pass was informed of the plan. The management feels that if Levis had half a dozen theaters instead of one, with night schools, ballrooms, lecture halls and the like in addition, the publicity program would have been still more successful.

Railway Wages Increased 3 Per Cent Between 1926 and 1927

WAGES for motormen and conductors in 44 of the larger cities of the country are tabulated for two years in the "Bulletin of Labor Statistics" for March, 1928. The dates selected are May 15, 1927, and May 15, 1926. The average increase between these two dates was 3 per cent. Twelve industries were considered and the electric railways were one of the six whose hourly wage rate increased during the year. The others were the bakers, building trades, chauffeurs and teamsters, book and job printing and publishing, and newspaper printing and publishing. On the other hand, four trades showed decreases in hourly wages during this period, namely, granite and stone cutters, laundry workers, linemen and longshoremen. The two industries covered in the report but not listed as increasing or decreasing were barbers and bus drivers. The barbers' wages could not be compared on an hourly basis. A table is published of wages of bus drivers from 27 cities as of May 15, 1927, in general, the bus lines listed are those affiliated with the electric railways in the cities covered. Corresponding data were not collected in 1926.

The number of men included in the electric railway group were: motormen and conductors, 57,289, and in the bus group were bus drivers, 2,730.

Cleveland Light Metal Car Uses Less Energy

Energy saving from reduced weight, as compared with the same car when built of steel, amounts to more than 17 per cent

Tests made with the aluminum car of the Cleveland Railway, No. 1376, have shown a considerable reduction in energy consumption owing to its lower weight. The car is of the company's standard "pay-pass" design, with one large entrance door in front and two exit doors at the center, known in Cleveland as the "1300 type." It was built some two years ago and was a conspicuous feature of the 1926 Convention exhibit in Cleveland.

The car is 51 ft. 2 in. long over bumpers and weighs, with equipment, 30,300 lb. The weight of a steel car of the same design and equipment would be 43,200 lb., so that the use of aluminum alloys effects a saving of about 12,900 lb. Full particulars of the structural features of the car were published in *ELECTRIC RAILWAY JOURNAL* for April 9, 1927, page 655.

The car was put in service Dec. 2, 1926, and a daily record has been kept of the car-miles made by it and the kilowatt-hours used. During part of this time the car has been used as a single unit and during another part of the time it has hauled a trailer. It began in train service, and from Dec. 2, 1926, to January 11, 1927, an additional 60 per cent in mileage was credited to it to allow for the extra energy taken in pulling a trailer. On this basis the following results were obtained:

Kilowatt-hours consumed	11,084
Car-miles run	4,864
Kilowatt-hours per car-mile	2.27

On Jan. 11, 1927, those in charge of the test began to keep separate readings, one set to be while the car was being run as a single unit and one set while it was being operated as a leading car of a two-car train. At the same time, the company decided to keep daily mileage and energy consumption records of three other cars of similar design but built of steel, operating over the same route under the same conditions. The results of this test up to the end of March, 1928, appear in the accompanying table.

It will be noticed that figures for per cent saving during January and February, 1928, are quite low compared with other figures in the same column. This is due to the failure of the trainmen to separate the records for

the aluminum car in single unit and train operation. This has now been corrected, and the figure for per cent saving is moving back to normal.

Window Wipers Speed Operation

REGULAR passenger cars of the Connecticut Company, New Haven, Conn., have been equipped recently with window wipers. The management believes that this will have two advantages: it will reduce the accident hazard by giving the motorman clearer vision in stormy weather, and it will also permit closer



Window wipers on cars of the Connecticut Company clear a large area of the glass in front of the motorman

adherence to schedules at such times, by relieving the motorman of the necessity of stopping the car every few minutes to clean off the glass of the front window. The wipers are of the swinging arm type and clear a large area of the glass. They are manually operated, as it is thought that such mechanism is more rugged and reliable.

Orders were first placed by the company for a few wipers for trial. These proved so satisfactory that orders were entered for enough to equip the remaining cars. A total of 947 cars have been equipped, making this the largest installation of the kind yet made.

COMPARISON OF ENERGY CONSUMPTION ON CLEVELAND RAILWAY ALUMINUM CAR 1376 WITH STEEL CARS 1370, 1371, 1372

Month	Aluminum Car 1376						Steel Cars 1370, 1371, 1372				Per Cent Saving
	As Motor		Kilowatt-Hours per Car-Mile	As Train		Kilowatt-Hours per Car-Mile	As Motor		As Train		
1927	Kilowatt-Hours	Car-Miles		Kilowatt-Hours	Car-Miles		Kilowatt-Hours	Car-Miles	Kilowatt-Hours	Car-Miles	Kilowatt-Hours	Car-Miles
January.....	3,210	1,450	2.21	3,108	846	3.67	38,270	13,711	2.79	20.4	
February.....	4,695	2,348	2.00	2,623	746	3.52	38,085	14,166	2.69	25.7	
March.....	4,682	2,414	1.94	2,535	674	3.76	42,550	15,938	2.67	27.3	
April.....	6,448	3,266	1.97	4,022	1,059	3.80	42,914	16,419	2.61	24.5	
May.....	4,897	2,474	1.98	2,386	627	3.81	43,108	17,068	2.53	21.8	
June.....	5,706	2,850	2.00	3,290	809	4.06	21,289	8,237	2.58	21.3	
July.....	6,036	2,990	2.02	2,639	676	3.91	31,020	11,940	2.60	22.3	
August.....	3,941	1,760	2.24	2,152	554	3.88	39,534	14,505	2.73	17.9	
September.....	.....	.....	.....	.....	.....	.....	40,760	15,544	2.62	.....
October.....	3,904	1,432	2.16	1,640	389	4.11	39,693	15,194	2.61	17.2	
November.....	4,342	1,832	2.37	2,531	600	4.22	39,399	14,758	2.67	11.2	
December.....	5,487	2,222	2.47	2,686	613	4.38	46,414	16,475	2.82	12.4	
1928											
January.....	7,416	2,872	2.59	3,309	709	4.95	48,736	17,512	2.78	6.8	
February.....	3,430	1,298	2.64	1,111	244	4.55	42,886	15,634	2.74	3.7	
March.....	5,829	2,472	2.35	2,133	457	4.66	42,250	15,971	2.65	11.3	
Total.....	70,023	31,680	2.21	36,165	9,003	4.02	598,908	223,072	2.68	17.6	

The Readers' Forum

Further Analysis of Car Heating Costs

CHICAGO SURFACE LINES,
CHICAGO, ILL., April 30, 1928.

To the Editor:

I have read the article by A. W. Baumgarten in the April 21, 1928, issue on the subject of cutting heating costs by recovery of energy from dynamic braking. This article has been of particular interest inasmuch as we have been studying the same problem for some time past and have been unable to estimate a saving of such magnitude as indicated by Mr. Baumgarten.

Mr. Baumgarten's figure for average miles per car per day, 180, is rather high for city service. We only average about 103 miles per car per day, or less than ten hours at 11 m.p.h. schedule.

The total heat required per month will, of course, vary from day to day, and the average car cannot be expected to be in service every day in the month as indicated by Mr. Baumgarten's figures. For purposes of comparison, full day months will be used, however.

The kilowatt-hours required to heat a car per day will necessarily vary with conditions, such as loading, outside temperature, use of storm sash, elimination of heat waste through windows, doors, etc.: thermostat setting and ventilation. A lengthy article in the Sept. 30, 1922, issue of the JOURNAL covered this subject thoroughly. It has been found that electric heating can maintain our cars in service at a temperature of 52 deg. F., which is our thermostat setting, with an expenditure of energy as shown in the accompanying table.

Outside Temperature, Deg. F.	Kilowatt-Hours per Hour of Operation	Kilowatt-Hours per Car-Mile Based on 11 M.P.H. Schedule
50	0.3	0.027
45	1.0	0.091
40	1.4	0.127
35	2.2	0.20
30	2.6	0.236
25	5.3	0.48
20	6.9	0.627
15	8.3	0.755
10	9.6	0.873
8	10.7	0.974

These figures are for a closed wood-body, double-truck car, 49 ft. 2 in. over bumpers, equipped with bulkheads, storm sash for winter use, having adequate ventilation and with seating accommodations for 40 passengers. Electric heaters rated at 8.8 kw. at 500 volts are installed, and have sufficient capacity to maintain a temperature rise of 40 deg. F. in service, as required by city ordinance. This contrasts somewhat with Mr. Baumgarten's statement of 13 kw. required to secure 35 deg. rise.

For the cost of hauling additional weight we prefer a figure of 0.05 to 0.06 kw.-hr. per mile per 1,000 lb. for energy alone used in transportation, as this is more readily applicable to any property than any arbitrary figure of cents per year. It takes into consideration average miles traveled as well as local cost of power. Based on 37,593 car-miles per year and 1.25 cents per kilowatt-hour as applied to our local situation this amounts to 2.58 cents per pound per year.

In order to make a direct comparison, I obtained the

government temperature record for Chicago for the months given in Mr. Baumgarten's paper and find that 6,478 kw.-hr. would maintain the temperature of one of our cars at 52 deg. F. for ten hours service each day, for a period of 168 days. This is shown in detail in the following table:

Month, 1924	Number of Days During the Month at Which the Average Temperature in Deg. F. Was:										Kw.-Hr. per Car*
	8	10	15	20	25	30	35	40	45	50	
January.....	8	1	6	3	3	2	4	3	1	0	2,028
February.....	0	0	0	5	6	8	8	2	0	0	1,155
March.....	0	0	0	1	1	10	10	5	3	1	805
April.....	0	0	0	0	1	1	1	2	8	7	247
November.....	0	0	1	0	2	3	5	8	3	5	564
December.....	6	2	2	1	6	6	3	4	1	0	1,736
Season.....	14	3	9	10	18	30	31	24	16	13	6,478

*Total kilowatt-hours per car for the month required to maintain a temperature inside of 52 deg. F. for ten hours of service each day.

It would appear that the car mentioned in the table was heated during the same season outlined in Mr. Baumgarten's article at a cost to our company of \$81, or \$375 less than the cost for heating Mr. Baumgarten's car. The cost of energy for heating is, therefore, the most important factor in a determination of whether an installation of this type would be economical or not, as the above difference in cost is greater than the estimated \$301 saving.

On Mr. Baumgarten's temperature curves the temperature rise continually grows smaller from 3 p.m. to midnight. For the five hours 7-12 p.m., a rise of approximately 28 deg. is maintained. In his article the average return of power is seen to be 8 kw. or 3.5 deg. rise per kilowatt of heater input. On our cars, mentioned above, we obtain approximately 4.55 deg. rise per kilowatt input and Mr. Baumgarten's older cars indicated 35 deg. rise with 13 kw. input, or only 2.7 deg. rise per kilowatt. Mr. Baumgarten's temperature curves would indicate that whenever the temperature falls below 22 deg. F. outside, auxiliary heat would be required in addition to that obtained from dynamic braking in order to maintain a temperature of 50 deg. F. in the car. In the season under consideration there were 36 days for which the outside temperature was below 20 deg. F. out of the total of 168, or 15.5 per cent. Some additional heat supply would be necessary for this. Mr. Baumgarten's article states: "The car was put in regular service at 5:30 a.m. with an inside temperature of 40 deg. F. obtained with the auxiliary heaters, and an outside temperature of about 12 deg. F." From his curves we read a rise of 28 deg. at 2:30 a.m. and a rise of 30 deg. at 5:30 a.m. or 2 deg. increase as a result of 5 kw. for three hours.

In our study of resistor heating of cars we have considered three distinct types or classes of utilization:

1. Inclose present grid resistors with ventilated box leading into duct in car.
2. Additional resistor heaters within car body for use as accelerating resistors.
3. Additional resistor heaters, control and motor capacity for rheostatic use in acceleration and braking.

The first plan is by far the simplest and while we consider it only 60 per cent efficient, the first cost is only

\$125, the additional weight 200 lb., and it is worth 5-10 kw. of heat, depending on installation and service, with an estimated saving of \$28.75 per car per year obtained at a cost of \$18.60, or net saving of \$10.15.

The second plan, while 100 per cent efficient, involves \$550 and 612 lb. additional cost and weight for 40 per cent of the heat required. A maximum saving of \$46 is obtainable at a cost of \$69 for fixed charges and \$14.40 for energy for hauling extra weight.

The third plan would furnish all the heat required, at a saving of \$115, but would require the following additions:

	Cost	Weight, Lb.
Heaters.....	\$840	680
Control.....	440	470
Motors.....	160	80
Total.....	\$1,440	1,230

Fixed charges of \$180 and energy cost for transportation of about \$30 would indicate this to be an uneconomical installation.

In conclusion it might be said that performance as outlined in Mr. Baumgarten's tabulation might be obtained for a single car, even to the excessive cost for energy consumed for heating, and if his cars require this much energy and an average of 180 car-miles per day for each day in the month is obtained, then it is entirely probable that it would be profitable to equip cars for the utilization of this waste energy. But we cannot expect that every property can show such savings and the individual economic factors must be determined for the installation under consideration.

W. C. WHEELER,
Engineer of Equipment.

NOTE—According to the custom of this paper, the above letter was submitted to the author of the article for such comments as he desired to make. Mr. Baumgarten has made a thorough analysis of the points raised by Mr. Wheeler, to which he has replied to in detail. His letter is printed below.—EDITOR.

CHICAGO & JOLIET ELECTRIC RAILWAY
JOLIET, ILL., May 19, 1928.

To the Editor:

With further reference to the article by the writer as published in the April 21, 1928, issue on the subject of energy savings from dynamic braking and heating, there appears to be some misunderstanding with regard to the data given in this article and particularly with respect to the costs and possible savings on other properties. With this in view, it seems necessary to explain further in detail how these figures were arrived at and point out particularly that the analysis given pertains only to the property of the Chicago & Joliet Electric Railway and that, in order to arrive at savings that might be effected on other properties, certain factors and conditions must be changed. This is true of the analysis of Mr. Wheeler's comments regarding the article appearing in the April 21 issue.

In the comparisons made by Mr. Wheeler, he has endeavored to reconcile the figures given with those of the Chicago Surface Lines, which cannot be done, inasmuch as practically no small properties enjoy the low power rates and low average mileage per car as those obtained in Chicago. It will be noted that Table III of the April 21 issue was based on 180 miles per car per day, 150-day heating season and thermostat control set at 60 deg. This was based on the full number of miles per day of cars in

service and not on the average miles per day of all city cars. If, as Mr. Wheeler mentions, the Chicago cars are in service less than ten hours per day, then the total equipment in use is a little over 50 per cent. On most smaller properties the average hours in service would be considerably more than this. On the Chicago & Joliet Electric Railway, the average service of all city cars is fourteen hours per day. However, the figures given in Table III are based on actual operation and metered energy over the period as shown and must be taken on the basis of 180 miles per car per day, 60 deg. thermostat setting and 150-day heating season. The heating season, however, is usually longer than this and, for the period shown, was actually about 168 days.

Referring to the table showing the variation of kilowatt-hours per hour of operation, with outside temperature as shown in the first of Mr. Wheeler's tables, it will be noted that the variation between different temperatures is neither uniform nor consistent. Plotting these figures, we find that there is a straight line variation from 35 deg. outside temperature to 8 deg. outside temperature, or the kilowatt-hours per hour of operation per degree change in temperature is 0.315 between the temperatures of 35 deg. and 8 deg. It appears that the figures given above 35 deg. were entirely off of the curve when plotted. This curve should be a straight line variation starting at 52 deg., or the thermostat setting noted. On this basis, the energy per car per hour should be as follows:

Outside Temperature, Deg. F.	Kilowatt-Hours per Hour of Operation 52 Deg. Thermostat
50	0.65
45	2.20
40	3.78
35	5.35
30	6.92
25	8.50
20	10.20
15	11.70
10	13.20
8	13.90

Taking the average of 190 kw.-hr. per car per day and correcting this figure for a 168-day heating season with an average heating season temperature of 31 deg., we obtain a figure of 0.326 kw.-hr. per hour of operation per degree change of temperature. This compares very favorably with the figure of 0.315 kw.-hr. per hour of operation per degree change of temperature obtained from the plotted curve of the figures between 35 deg. and 8 deg. outside temperature given by Mr. Wheeler.

If this is true, then to maintain a temperature rise of 40 deg. F. in service, as required by city ordinance referred to by Mr. Wheeler, would require a capacity of 12.6 kw. The old cars on our property, with a capacity of 13 kw., would not maintain 60 deg. temperature when atmospheric temperatures were below 25 deg.

The cost of hauling weight per year of 4 cents per pound would probably not hold true on other properties and, expressed in other terms, comes to about 0.0625 kw.-hr. per car-mile per 1,000 lb.

The average temperature for the heating season, based on the temperatures given in the second table in Mr. Wheeler's comments, shows an average of 31 deg. for the season of 168 days. This would require an average temperature rise of 21 deg. with a thermostat setting of 52 deg. On the basis of 0.315 kw.-hr. per degree change of temperature and ten hours per day operation and a 168-day heating season, we would obtain 11,100 kw.-hr. per car per year for electric heat which, at a cost of 1.25

cents per kilowatt-hour, would amount to \$139 for energy only.

With reference to the chart in the article in the April 21 issue, page 650, showing the car temperatures obtained in the car on March 5, 1928, we wish to emphasize that this is only a typical temperature curve taken with the recording meter in the car on that particular day. Therefore, the difference between outside temperature and car temperature does not indicate the maximum temperature obtainable from dynamic braking and resistor loss heating, but does show that it is possible to expect an average rise of 30 deg. to 35 deg. within the car. It will be noted also that the average return of power from dynamic braking only may be as high as 8 kw. To this must be added the heat of starting resistor loss, which is about 20 per cent of the power input to the car, making a total of approximately 13 kw. power return to the car. It is not possible to know accurately the average actual kilowatts return of power to the car with this dynamic braking and resistance loss heating. However, on the basis of season heating tests on the older cars, we obtained a temperature rise of 3.05 deg. per kilowatt input. And, since we have obtained an average temperature rise in the new car of about 30 deg. to 35 deg., it is reasonable to suppose that the average power return in heat is between 9.8 kw. and 11.4 kw. The amount of this energy return is entirely dependent on the scheduled speed, stops per mile and grades on which the car operates.

We have found that in general the auxiliary heat is not used when atmospheric temperature is above 15 deg. F. Therefore, the total number of days during which auxiliary heat would be operating would not be more than 10 per cent or 12 per cent and the heat of 3,000 kw.-hr. per car per year, as given in Table IV of the April 21 article, is sufficient to take care of this 10 per cent and additional two hours auxiliary heating required in the morning before the car is put in service. One point not explained in the article and which may be noted in the temperature curve obtained on March 5, is that the resistor heaters retain their heat for some considerable time. It will be noted on the typical chart of March 5 that the car temperature dropped only 10 deg. from 12 o'clock midnight to 2:30 a.m., at which time the chart was changed and auxiliary heat was turned on. The car was out of service at 12 o'clock midnight.

In analyzing the three types of heating enumerated in Mr. Wheeler's comments, it is stated that the resistor accelerating heat "is worth 5-10 kw. of heat depending on installation and service, with an estimated saving of \$28.75 per car per year." If a minimum of 5 kw. of heat can be obtained from starting resistors on a basis of ten hours per day, 168-day heating season and 1.25 cents per kilowatt-hour, the total energy saving would be about \$104 and, with 60 per cent efficiency, would be an estimated saving of \$62.40 instead of \$28.75.

In the second plan, with the additional resistors within the car body, this would give a minimum saving of \$104 or a maximum saving of \$208.

By the use of dynamic braking and starting resistor loss heat, it would be possible to obtain all of the energy required for heating and, as mentioned previously, with a thermostat setting of 52 deg. and an average seasonal temperature of 31 deg., this saving would be \$139, based on an energy cost of 1.25 cents per kilowatt-hour. During the heating season and with electric heat it is invariably true that the peak demand occurs on the days of lowest temperature and, therefore, the demand charge for the electric heat would be about 12 kw. The

cost of this demand charge, in the case of this company, would be about \$152 per car per heating season, and the energy cost, based on fourteen hours average car operation, would be about \$156, making a total energy cost per car per year of \$308. Mr. Wheeler has not explained in his comments as to whether the 1.25 cents per kilowatt-hour takes care of this additional demand charge. Some years ago this company abandoned the use of electric heaters and the maximum demand for the year was reduced about 400 kw. at a total saving of \$7,200.

In making comparisons of savings, Mr. Wheeler has not taken into consideration the additional substation equipment capacity required where electric heaters are used. It is reasonable to suppose that, with 12 to 15 kw. heater capacity per car and with maximum demand practically always occurring on the coldest days, it would be necessary to provide at least 15 kw. capacity in substation equipment per car in service during peak load hours. Therefore, with electric heat there will be an investment in the substation which is comparable to the total investment per car with dynamic braking and resistor heating. The substation capacity of this company since the abandonment of electric heat a number of years ago has been reduced 250 kw. and, with the installation of new substations, has effected an investment saving of \$500 per car in city service.

In conclusion, analyzing the costs of electric heating based on *average* cars in service, it is estimated that the savings per car per year would be not less than \$250. And, based on *actual* cars in regular schedule service, the figures as outlined in my article are conservative, inasmuch as savings in substation investment and maximum demand charge are not taken into consideration.

Referring to Mr. Wheeler's analysis of electric heating versus dynamic braking and starting heating, he has not considered the fixed charge of electric heating but has based his net savings on energy saving only. This does not give a true comparison. Also, if storm sash and other means of insulation are used on the car for the conservation of energy with electric heating, this additional investment must be charged against electric heating cost. Furthermore, in my article we have considered only the savings to be effected in heating cost and have not given credit to the dynamic savings of brakeshoe wear and maintenance cost, which would be an appreciable item, and other indirect benefits to be derived from the braking. In actual service, it has been found that dynamic braking is sufficient for about 90 per cent of the total braking in making service stops, so that if this method of braking is only used during the heating period, we might expect about 40 per cent saving in brakeshoe maintenance and wear. If this method were extended to both summer and winter use, the saving would be considerably greater. Where the dynamic braking and heating are only used during winter periods, we believe it is safe to assume that additional motor capacity is not required inasmuch as the cooling of the motors would be much more rapid during the cold weather.

Taking all of these things into consideration, it is true that the saving effected on this property would not be the same on other properties and each case must be analyzed from the basis of service, number of cars and energy costs on the property in question. However, we believe that the possible savings shown on this property are conservative and that, if all items are taken into consideration, they eventually might even be greater.

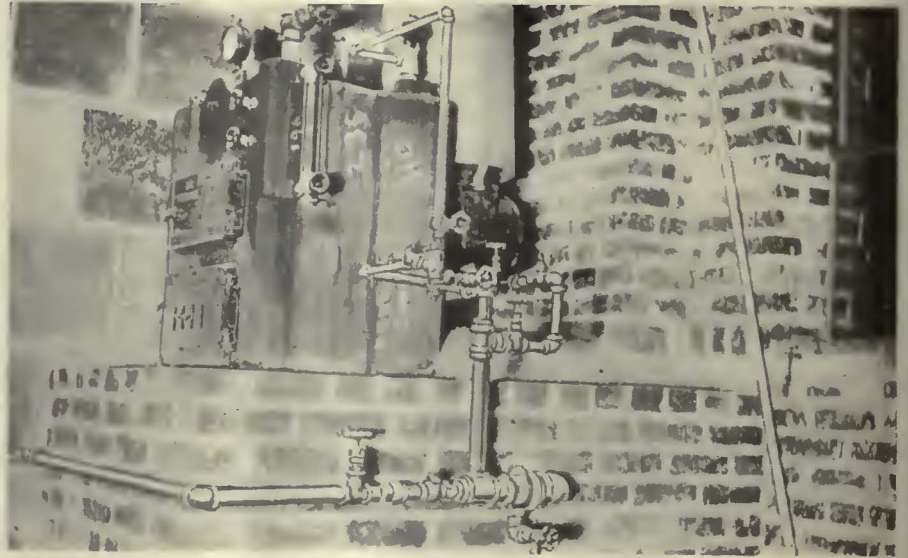
A. W. BAUMGARTEN,
Division Engineer.

Maintenance Methods *and* Devices

Screw Press for Straightening Bars and Rods

ANY PRESS is a very handy tool to have in a shop, especially when it can be used for straightening bars, rods, etc. The press shown in the accompanying illustration is used by the New York & Harlem Railroad, New York City, and was designed and constructed in its shop. Although it is used for straightening plow bars primarily, it can be and has been used for straightening many other kinds and shapes of metal.

A steel bar 38 in. long, 3 in. wide and 7 in. thick is used as a base and is embedded in the concrete floor so that 4 in. of it projects above the surface. Two 2x3-in. fulcrum blocks 4 in. high are welded to the base, each about 1 in. from either end. The top surface of these blocks is concaved to correspond to a radius of 1½ in. Two 1x2-in. V-shaped uprights are welded and bolted to a threaded casting of 4 in. diameter, 5 in. long and the lower ends welded to the base. One end of a ½x2-in. brace is bolted to one of these uprights on either side and the other embedded in the concrete floor. These braces provide additional rigidity. A screw of 3 in. diameter and 18 in. long is installed in the threaded casting. One end of this screw is designed with a head of 3¼ in. diameter, 4 in. high and is provided with two 1½-in. diameter holes drilled diametrically opposite on 1½-in. centers for reception of a leverage bar. The other end is provided with a pressure head 3-in. diameter, 3 in. long and concaved at 1¼ in. radius.



Portion of incinerator with automatic water-feed control

The screw is designed with five threads per inch.

This machine has been found very serviceable and has not failed to produce the results for which it was designed.

Incinerator Provides Steam for Shop Use*

BY CHARLES HERMS
General Foreman, San Diego Electric Railway, San Diego, Cal.

CONSIDERABLE rubbish and scrap lumber must be disposed of around electric railway repair shops, creating more or less of a problem on most properties. As a convenient means of getting rid of this, the San Diego Electric Railway has built an incinerator in such a manner as to

supply heat to a 15-cu.ft. capacity steam boiler. The steam is used for various cleaning purposes around the shop. It also furnishes heat to the paint shop.

The fire-box door is on the outside wall of the building. This is not shown in the accompanying illustration. The boiler has an automatic water-feed control so that no attendant is required.

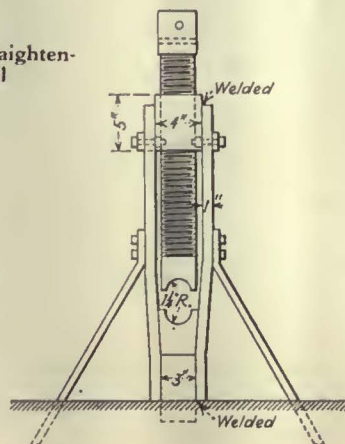
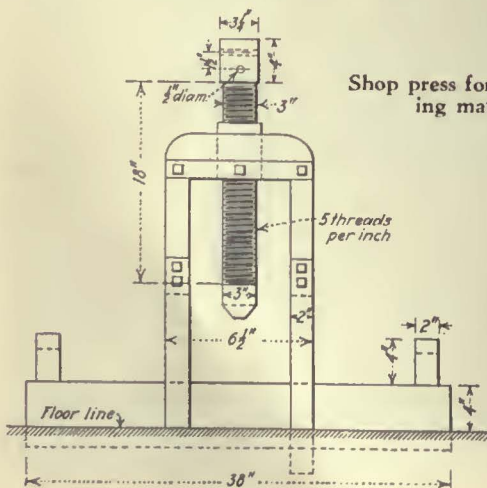
Motor Leads on Axle Side Reduce Trouble*

BY R. T. CHILES
Master Mechanic, Cumberland County Power & Light Company, Portland, Me.

TO REDUCE failures of motor leads from rubbing and short circuiting, the Cumberland County Power & Light Company brings the leads out on the axle side. Inside-hung motors are used on the company's standard type safety cars. With this arrangement during the year 1926 there was but one lead failure for every 104,551 motor-miles operated and 55 per cent of these failures occurred during January, February and March, when there was a large amount of snow and rain.

With inside-hung motors the company found it impossible to keep leads from chafing on brake levers

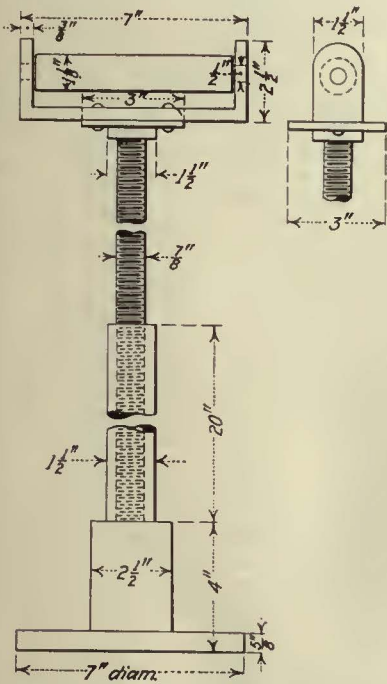
*Submitted in ELECTRIC RAILWAY JOURNAL Prize Contest.



and motor cases where the leads were brought out on the suspension side. On the axle side the leads hang clear and do not come in contact with the brake rigging or motor cases. The small clearance between the car floor and motors on standard Birney type safety cars makes it necessary for the leads to lay on top of the motor where they are brought out on the suspension side.

Portable Stand for Drill Press

MACHINE work in the wood mill and machine shop can be done more readily if suitable equipment is provided to support the material undergoing the process. In the shop of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., a portable adjustable stand for use in the machine shop and mill was constructed. This stand is shown in the accompanying illustration. The base is a forging with a flange and a hub of 2½-in. diameter to which a piece of



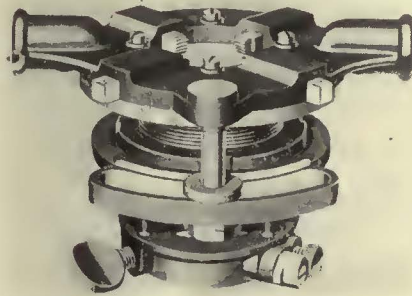
Adjustable stand for holding long material while being machined

steel of 1½-in. diameter and 20 in. long is welded. It is drilled and tapped for a screw 20 in. long fitted with a flange, to which is riveted a bracket 7 in. long. A roller made of tubing 1½ in. inside diameter and 1½ in. outside diameter is mounted on a ½-in. shaft and installed in the bracket. Turning the adjusting screw to the right or left in the upright raises or lowers the roller to any height desired for supporting the work.

New Equipment Available

Self-Contained Die Stocks

TWO new self-contained adjustable die stocks are announced by the Borden Company, Warren, Ohio. The No. 11 Beaver supersedes the



Adjustable die stocks

old No. 25 plain tool and the No. 11A Beaver supersedes the old No. 26 ratchet.

With the new tools one set of dies is set quickly to thread 1-in., 1¼-in., 1½-in. or 2-in. Mislaying of the dies is impossible. Adjustments are made to thread under or over standard without affecting the length of the thread. The threading dies in the new tool are made of high-grade alloy steel, specially treated, hardened and tempered to give long life.

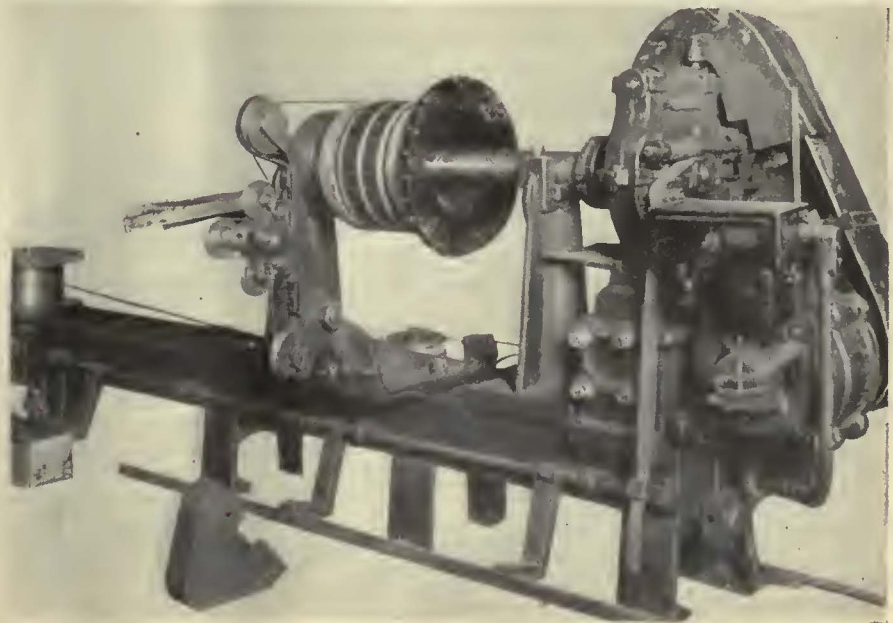
In the new tools the die heads and threaded barrel are two separate parts so that when repairs are required but one part need be replaced. The work holder, or pipe-gripping device, is of

new design and centers the pipe more accurately than previous types. Two knurled screws are set quickly and hold the pipe firmly, leaving only the thumb screw to be tightened after the die stock is placed on the pipe. Loose bushings are eliminated.

Banding-Wire Tension Indicator

EXACT tension in pounds on steel banding wire as it is wound on railway armatures by the banding machine or lathe is indicated by a device developed by the General Electric Company, Schenectady, N. Y. It provides a simple means of keeping track of this tension throughout the entire progress of banding the armature. The wire will not be stressed beyond the elastic limit or tensile strength of the steel, and will be kept under uniform tension during the winding.

An essential characteristic of the indicator is that it can be attached to practically any type of armature-banding machine. It is equipped with a rotary dial which can be turned to any position by loosening a nut and setting the pointer at zero, so that the scale may be read at any angle. The indicator dial is calibrated and graduated from zero to 500 lb., allowing the use of any size banding wire within the range of the machine. The center pulley wheel over which the wire runs is actuated by a heavy coil spring so that when the banding machine or lathe is started and stopped a constant tension is maintained.



Tension indicator with cover removed, attached to armature banding lathe

Association Activities

Journal Becomes Correspondent of International Association

THROUGH appointment by the Union Internationale de Tramways, de Chemins de Fer d'Intérêt Local et de Transports Publics Automobiles, this paper has just become the official correspondent of that association in the United States. In consequence, it will publish notices of forthcoming meetings of the association. It will also be pleased to answer any inquiries from railway men in the United States in

regard to the organization and its proceedings and of European electric railway practice in general, where it has the information.

The International Association completed on May 12 a six-day convention in Rome, Italy, at which subjects of very live interest to electric railway companies were discussed. Several of the reports presented at this meeting have been published in this issue and in that of May 26. Others, with a report of the convention, will appear in future issues.

Ashton, where a single-truck one-man car, provided with a smoking compartment, was put in service in December, 1923. Entrance and exit were at the front with manually operated doors. The headway was reduced from twenty minutes to fifteen minutes. A conductor is used on this car during 1½ hours morning and evening. No financial results have been published, but it is reported that the service has been expanded to six cars.

The city of Malmö, Sweden, began one-man service in 1921 with a number of old cars and very little change except to close the doors on the rear platform. In 1924 the service was expanded by the addition of cars equipped with separate entrance and exit on the front platform, the exit door being unlocked by the operator at each stop, opened by the passenger and closed by a spring. Fare boxes were used. Later, one city and three suburban lines were changed over to one-man operation. The most important of these lines, 4½ miles in length and with average distance between stops of 1,150 ft., carries 10,000 passengers daily. The headway was reduced and although the operators receive 10 per cent more wages than are paid to motormen on two-man cars, the saving in platform expense and materials has been very satisfactory.

As already explained, the only changes made on most lines in Germany and Austria, when one-man service was begun, were to close the rear platform doors, and post notices urging boarding passengers to have the exact change. It is not surprising, then, that these lines should show a reduced schedule speed owing to lengthened stops. On most of the systems, where one-man operation has been adopted, about fifteen altogether, this kind of service has been limited to lines of light traffic where the fare system was simple and where there was little passenger interchange. Generally, fares were collected in a fare box similar to the Cleveland or Johnson types.

Halberstadt has been using such a system for some time, with fare collection supplemented at heavy traffic points by street collectors.

Dresden has been running some cars on lines of light traffic, but later the service was extended to lines of heavy traffic. In 1922 there were 47 one-man cars, all single truck. During rush hours a conductor is sometimes used. The management believes that 40 passengers is the maximum which can probably be cared for on any of its one-man cars.

Brandenburg has installed several one-man lines, and to simplify the fare collection problem sells tokens at a reduction from the regular fare.

Berlin made a short trial, but when the traffic on the line increased, returned to two-man cars.

One-Man Cars and Buses in Europe¹

One-man operation is becoming more popular in Europe as the difficulties with fare collection are being overcome. Full automatic equipment is urged for both cars and buses. Details are given of Paris practice

By LOUIS BACQUEYRISSE

General Manager of Transportation, Société des Transports en Commun de la Région Parisienne (Paris Surface Railway and Bus Lines), Paris

STUDIES of ways to reduce electric railway operating expenses come down in practice, always, to questions of equipment. This is true even of those disbursements made primarily for labor. If we are seeking to reduce the expenses attributable to poor quality of employees, we turn to equipment for the scientific selection of applicants for employment. If we aim to reduce the percentage cost of platform labor in our operating expenses we must investigate types of car equipment which increase the output of our platform men in car-miles.

A great deal has been published about the use of one-man cars in America.² Some progress along these lines has been made in Europe, though the number of one-man cars at present in operation there now will hardly exceed 400. Briefly the situation is that in England, Switzerland and France a few trials have been made. In Holland and Sweden one-man cars are quite generally employed. In Germany, Austria and Denmark a few trials have been made, but in most cases they have been with old cars without any of the distinctive one-man safety features. Simply the rear door has been closed.

The experience in Holland is made the subject of another report to be presented at this convention, so that the

writer will review only the conditions in the other countries mentioned.

In England a single one-man car was put in service by the London United Tramways in 1922. It was a single-deck single-truck car with capacity for 30 seated passengers. Entrance and exit were in front and the door and folding step were interlocked and operated by hand. An automatic ticket-issuing machine issued five different types of tickets, and there was a travel indicator in the car to show to passengers its position on the road.

The result of the trial was so satisfactory that in 1924 the London United Tramways purchased four double-truck single-deck one-man cars. They were fitted with air brakes and pneumatic door engines with front entrance and rear treadle exit and a standard "dead man's handle." Fares were collected in a Johnson fare box, and the operator was assisted in fare collection by an automatic change-making machine.

The fare was that standard in London of 1 penny for one zone and 2 pence for two zones. The schedule speed was 10 m.p.h., with average stops of three seconds each. The operators received an increase of 10 per cent over the wages paid motormen on two-man cars.

The financial result with these cars is not available, but they did not prove popular with the London public, the reasons given being (1) absence of an upper deck which the English like because it gives them a place where they can smoke their pipes and (2) too complicated a system of fare collection on a line having many fare zones.

Another English installation was at

¹Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1923.

²The extended survey of American one-man car practice by Mr. Bacqueyrissse occupies 72 pages in his report. It is not reproduced.

Augsburg, a city of 160,000 inhabitants, has been trying one-man cars on quite a general scale since 1923, though "floating" conductors are used in the congested sections during rush hours. The platform expense was reduced 35 per cent.

Odense, Denmark, runs all of its seventeen motor cars with one man, except that at times they pull trailers. The doors are manually controlled and a locked fare box is used. As the cost for labor, even under one-man operation, amounts to 54 per cent of the total expenses, it is obvious that one-man cars are a necessity. No accidents have been reported since 1911, except collisions with other vehicles on the street, which cannot be attributable to one-man car operation.

The systems in Arnhem and Amsterdam, Holland, are mentioned in another paper on this subject by Mr. Nieuwenhuis. All of the 63 cars in Arnhem are one-man, although there are several different types, varying in length from 27 ft. 10 in. to 33 ft. 6 in. over all. The doors are manually operated, but no special safety equipment is used except a dead-man control. The schedule speed is 12½ m.p.h., and a notable saving in platform expenses has been obtained, though the one-man operators are paid a bonus.

In 1924 the Swiss Federal Railway Department issued a list of minimum requirements as to safety for one-man cars, although the one-man system as in the other countries mentioned has as good a safety record as with two-man cars. These regulations relate principally to means by which passengers may stop the car and open the doors in emergency.

In Montreux, three cars have been in operation with satisfactory results, although on one line the grade is as high as 8.5 per cent.

One of the interurban lines out of Berne uses one-man cars 43 ft. 5 in. long. Basle had one car, but withdrew it because of increase of traffic on the line in question.

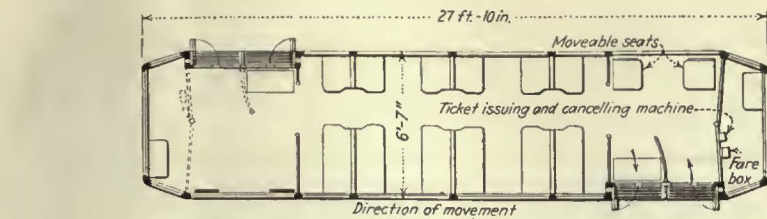
The Paris surface lines have done considerable in the way of one-man operation, as explained in a recent paper by Mr. de Ribes.³ The latest one-man car has a capacity of 30 seated and 20 standing passengers. The two front doors are operated pneumatically, the entrance by the motorman and the exit on the rear platform by the Chicago treadle device. The two rear doors are kept closed except when a conductor is used. Folding steps interlock with the doors.

Since the development by the company of a special ticket-issuing and cancelling machine, mentioned in another report to the convention, the time taken to collect zone fares by one man presents no further problem.

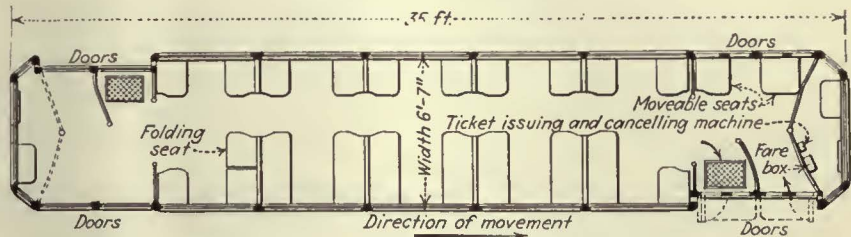
ONE-MAN BUS OPERATION

One-man operation for buses is fortunately farther developed in Europe than one-man operation for tramways, though the absence of statistics prevents an ex-

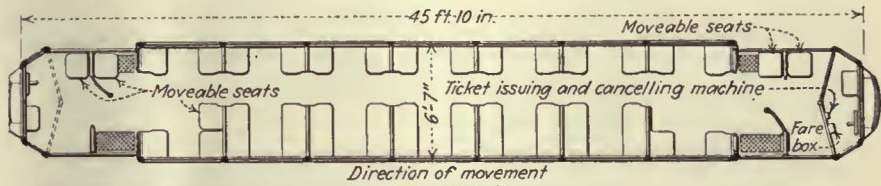
³See paper by Mr. de Ribes in ELECTRIC RAILWAY JOURNAL for April 28, 1928, page 704.



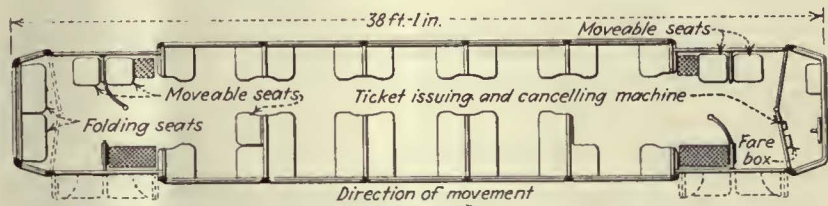
Recommended single-truck one-man car for lines with light traffic under European conditions



Recommended type of one-man car for large European systems



Recommended type of one-man car for European interurban service



Paris end-entrance double-truck trail car intended for one conductor but so designed that two may be used

act statement. The use of one man has not been extended as yet to double-deck buses, which are the standard in London and Berlin.

In England a notable instance of one-man operation of buses is at Leeds. In Holland, Amsterdam has 92 one-man buses, each with accommodations for 21 seated passengers. The single entrance and exit door is 24 in. wide and is manually controlled. The schedule speed of these buses is 9.6 m.p.h., with an average distance between stops of 1,226 ft. and an average length of stop of 8 seconds. A flat fare is used. The average number of passengers per car-mile is 4.6. The Hague has 28 one-man buses. They are from 24-passenger to 32-passenger seating capacity. Loosduinen in Holland has 18 one-man 20-passenger buses.

Vienna has 34 one-man buses. The fare collection problem is simplified in this city by the installation of automatic ticket-issuing machines at the most busy loading points and by street collectors at certain places during the rush hours. Under present economic conditions in Vienna, two-man service would be impracticable. The accident record is very low. Luxembourg has five one-man buses. They make a schedule speed of from 9½ to 11 m.p.h., with average distance between stops of 1,000 ft.

The Paris Surface Railway & Bus Company (S.T.C.R.P.) is operating a number of suburban routes, with one man, to good satisfaction.⁴ Bordeaux has ten one-man buses and 40 two-man buses and favors the former.

CONCLUSIONS ON ONE-MAN CAR OPERATION

While much can be learned from America about one-man operation, it does not follow that American methods can be transferred bodily to Europe to advantage. The principal differences in conditions between America and Europe are: (1) excessive complication of European fares; (2) greater readiness of the American passenger to accept regulations intended for his safety.

Europeans have also to contend with limitations on the dimensions of the equipment which they must use, particularly the width of car body. The usual European width of 2 m. (6 ft., 7 in.), prevents the employment of cars with a capacity of 150 passengers each, common in America, and limits one-man car capacity for city service to about 50 passengers. For interurban service we can approach more nearly American standards.

⁴For further information see paper by Mr. de Ribes in ELECTRIC RAILWAY JOURNAL for April 28, 1928, page 704.

With the limitations in dimensions and capacities mentioned, the writer feels he can recommend specific types of one-man cars for three different kinds of service, namely, light city traffic, large city systems and interurban routes. Diagrams are presented of the cars suggested, with one of a double-ended one-man trail car used by the Paris surface lines.

The first car shown, that for light and medium traffic, has accommodations for 20 seated and 20 standing passengers, and a wheelbase of 9 ft. 10 in. to allow it to go around a 50-ft. radius curve. The car is designed for Cardan drive with high-speed ventilated motors. The body is partly wood and partly light metal. There are separate entrance and exit doors at the front, pneumatically operated, and interlocked with the controller. The exit door is controlled by a treadle and the door on the rear platform is kept locked. When the direction of movement is reversed the fare box, ticket machine, barriers and two movable seats on the front platform are changed to the other end of the car.

The second type of car, designed for large city systems, has a capacity for 30 seated and 20 standing passengers, and a wheelbase of 12 ft. 6 in. The recommended type of motor suspension and nature of safety equipment are the same as for the small car. There are four doors on each side of the car but those on the rear platform are intended for use only when the car is being operated by two men or at important loading points where there is a street collector.

The third, or interurban car, has a capacity of 40 seated and 20 standing passengers and is mounted on double trucks. Each truck has two motors with Cardan drive. All-metal body construction can be used here, as there is less chance of damage to the vestibules from street collisions. The eight doors (four on each side) are arranged as in the large urban car, except that each of the exit doors is controlled by a treadle. This car has five movable seats. The two on each platform are transferred to the opposite side of the car when the direction is reversed and one seat is moved from one end of the car to the other to give more room at the front end.

On systems where at certain hours there has to be a very large increase in passenger accommodations, the answer can often be found in the use of trailers of a large capacity. The Paris system has two types, one a double-truck center-entrance 57-passenger car and the other the double-truck end-entrance, shown in the fourth illustration. This car has a capacity for 34 seated and 21 standing passengers, with four doors on each side, of which two are for exit and treadle operated, all pneumatically. The car is designed for one conductor on the front platform, but if desired, a second conductor can be stationed behind the railing on the rear platform with a second set of fare boxes and ticket issuing machines and with the end folding seats raised.

In general, a capacity of 20 passengers is sufficient for buses on small systems,

especially where some light baggage has to be carried, and for express service in large cities; a desirable type of bus for systems of average size is for 30 passengers, and that for large cities is 40 or even 50 passengers. Where streets are very congested and street area is at a premium, there is a field for the double-deck bus.

For interurban runs, the six-wheel 29-passenger bus has a field, and for interurban runs of more than 35 miles, the 20-passenger bus will probably fit into more places than any other.

In city service the work required of the driver will be much simplified if the doors are operated by air.

While the one-man bus may not make quite as rapid time as the two-man bus of the same capacity, what the passenger loses in speed he makes up in frequency of service. Powerful equipment should be used to obtain rapid acceleration and retardation. Speed is also a function of the number and length of stops, and the latter in turn are largely affected by the arrangement of platforms, steps and doors, and by the method of fare collection. This latter can be speeded up by

the use of fare boxes, ticket-issuing and cancelling machines, and change-making machines. At certain periods of the day a conductor or street collector can be used to advantage.

While the flat fare is the simplest to collect, the automatic ticket-issuing machine greatly reduces the complication of the zone-fare collection and, of course, pay-enter, pay-leave can be used on two-section lines, if the fare is uniform for each section.

Finally, two essentials to the success of one-man service should not be overlooked. One is to secure the hearty co-operation of the employees by convincing them that their interest, like that of the company, is improved by economical operation and that no equipment will be omitted to simplify their work. The other essential is to secure the co-operation of the public. This can be done by instructing it, in advance of the actual introduction of the one-man car, of its advantages in the way of comfort, safety, increased service, and less need for higher fares. This can be done through the press, by moving pictures, and by notices posted in the cars.

Improvements in Rail and Ties*

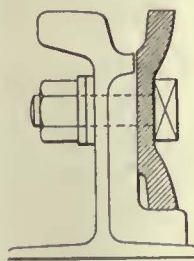
Rail standardization is gaining more converts. Thermit is widely used for joints. Trials of ties being made

BY ED. VAN NOORBEECK

General Supervisor,

Société Nationale des Chemins de Fer Vicinaux of Brussels, Belgium

IT WILL be recalled that the International Commission on the standardization of street railway rails has recommended four rails for straight track and four corresponding rails for curves, as shown in the accompanying



Hard metal guard used on curves by some European street railways

table. A number of companies, especially in France and Switzerland, have accepted these standards.

For track over private right-of-way the almost general practice is to use a T rail, varying in weight from 36 to 72 lb. per yard. Some companies are using rails weighing from 90 to 100 lb. per yard.

Rail lengths are rarely less than 29½ ft. and for grooved rail are usually 39½ ft. or 59½ ft. One company (that in Brussels) has used rails as long as 65½ ft. but such rails are awkward to han-

dle in city streets. Comparatively few companies are using transition curves, though such use is advisable where car speeds are considerable. Opinion is divided as to the desirability of inclining the rail and also between coned and horizontal tread wheels. Rail inclination is usually secured through an inclined base plate. Some companies use shallow grooves on the outside rails of curves so that the wheels will run on their flanges. Many companies use hard composition rails (manganese, nickel chrome, etc.) on curves. Some use on curves a rail without a lip but bolted to it is a guard rail of wear-resisting steel, as shown in the accompanying section. Only a few companies use a resilient material, wood, cloth or felt, under the base of the rail. However, such a plan undoubtedly reduces rail vibration and is especially desirable with a concrete substructure.

Rail joints are made with angle plates, thermit or arc welding.

Thermit is used in three different ways. Under one method used in new track and known as the pressure process, the rail heads are ground square and butted together with a small space ground out between the webs and bases. After the thermit has been cast around the joint, the heads are pressed against each other by powerful clamps. The joint is then machined. Where the rail is not free, this process has to be changed slightly.

*Abstract of paper presented at the biennial meeting of the Union Internationale de Tramways, de Chemins de fer d'Intérêt Local et de Transports Publics Automobiles, held in Rome, Italy, May 6-12, 1928.

TABLE OF GROOVED RAILS RECOMMENDED AS STANDARD BY THE INTERNATIONAL COMMISSION

Straight rail	Weight		Height		Base	
	Kg. per Meter	Lb. per Yard	Mm.	Inches	Mm.	Inches
1	59.430	118.86	180	7.1	180	7.1
2	53.020	106.04	180	7.1	160	6.3
3	46.920	93.84	175	6.9	155	6.1
4	47.235	94.47	160	6.3	160	6.3
Curved rail						
1	61.560	123.12	180	7.1	180	7.1
2	52.150	104.30	180	7.1	160	6.3
3	50.750	101.50	175	6.9	155	6.1
4	51.220	102.44	160	6.3	160	6.3

The joint is opened by an expansion press and after the thermit is poured, the press is removed and the released elasticity of the rails supplies the pressure instead of clamps. In the third process, which is used principally with old track, a space of from $\frac{1}{8}$ to $\frac{1}{4}$ in. is sawed between the rail ends. After a mould has been set about the joint, it is preheated and the thermit is poured, some metal remaining over the rail head. After the joint has cooled it is machined. This third method is used principally for rail in place, where the other methods cannot be adopted. (See Editor's note.)

Better results than formerly are being secured with electrically welded joints and their use is increasing. This is partly because the technique of welding is understood better and partly from improvements in design. These latter lie principally in the addition of a base plate welded to the rail bases, just as the angle plates are welded to the sides of the rail. In fact, one company (Société Nationale des Chemins de Fer Vicinaux of Belgium) has laid 5,000 joints with welded base plates but no angle plates. Where this has been done, the rail ends are prepared for welding by having their edges beveled off with the electric arc all the way around except at the base. After the base plate is welded in place, the notch formed between the beveled edges is filled up with metal by the arc. Then the rail heads are ground smooth. Marsailles has also used this method of notching or chamfering the ends of two abutting rails and filling up the space with metal deposited by an arc. In that city, while the notch in the heads of the rails is being filled with metal the rails are kept aligned by temporary angle plates. After the work on the head is finished, these plates are removed and the sides of the rail are treated in the same way.

Of the 76 companies replying to the questionnaire, 60 used some kind of joint welding. Of these, 26 employed thermit only, the other 34 using both thermit and arc welding. Of this latter number, eleven used arc welding only for auxiliary track work or at compromise joints. The other thirteen used thermit for new track and arc welding for old track. A recent article in a French engineering paper points out that the effect of the heat necessary in welding joints tends to soften the steel by reducing the carbon and manganese contents. It suggests, if possible, some method of welding by

which air would be excluded from the rail surfaces. No practicable plan has been developed to accomplish this result, but it is worth the attention of welding experts.

As for ties, of the 76 companies replying to the questionnaire, 63 used ties of some kind. Of this number 40 used wooden ties only, four metal ties only, and the remainder ties of more than one kind. Of the latter number, six have reinforced-concrete ties in experimental use. Where wood ties are employed, oak is most generally used, then pine, then beechwood. The ties are usually treated with creosote, sulphate of copper or carbolineum.

The four companies using metal ties

exclusively are Constantinople in Turkey, Hamburg and Mannheim in Germany, and one road in the Belgian Congo. Paris is one of the roads testing metal ties.

Where reinforced-concrete ties are being employed, steel plates or wooden blocks are set in the concrete so that the rail may be held to it by screw spikes or clips. Concrete ties may be considered to be still in the experimental stage. They are expensive and awkward to handle but have manifest advantages in moist soil.

Editor's Note: All the thermit methods differ from that generally used in this country. The pressure method is very difficult here because American rails are much higher in carbon than the European rails. As the carbon content increases, the difficulty of pressure welding increases very rapidly. Also, it is usually thought necessary in America to weld from twenty to thirty joints per day with one equipment. Since the European method requires a loose rail ahead all the time, the amount of track which can be laid in a day is limited and the production is cut to perhaps six to eight joints per day. The clamps used in European welding weigh about 800 lb. On the higher carbon American rails, a much more powerful clamp would be required to get satisfactory results. It has even been considered necessary to use hydraulic clamps for this type of welding wherever American rails are used. The use of clamps of this type would, of course, increase the cost of the welding in America to a point where it would be almost prohibitive. With the "insert" method as used in America, clamps of this type are not necessary. In fact on wood tie track, no clamps at all are required, and on steel tie track, light clamps are used only to hold the rail in line while the welding is being done, provided the welding is done ahead of the laying of concrete. If the welding is done after the concreting, no clamps are required on this type of track.

The second type of welding described in Mr. Van Noorbeeck's article, that by pressing the rails apart, is not practiced in America. The "insert" method obviates its necessity. The third method described also differs from that used here, as in this country a shim of rail steel is inserted between the rail ends before the rail is cast. This prevents any danger of cupping.

Incidentally the Metal & Thermit Corporation of New York, from which the data in this note were obtained, is closely allied with the Thermit companies of Europe. The closest co-operation is maintained among the four companies and each avails itself of the methods and processes of the others, as well as of their engineering advice and experimental work. The different processes developed show how methods have to be changed because of dissimilar conditions.

Wood Preservation Meeting

COMMITTEES of the American Wood Preservers' Association and the American Railway Engineering Association on Wood Preservation will hold a summer meeting in Chattanooga, Tenn., June 12-13. All those attending will have the opportunity of visiting the treating plant of the Western Union Telegraph Company, where zinc meta-arsenite is being used, and the car shops where lumber treated with this preservative is being utilized.

COMING MEETINGS OF

Electric Railway and Allied Associations

June 4-6—Midwest Electric Railway Association, Hotel Baltimore, Kansas City, Mo.

June 4-8—National Electric Light Association, Atlantic City, N. J.

June 6-8—Canadian Electric Railway Association, annual convention and exhibit, Toronto, Canada.

June 12-13—American Wood Preservers' Association, Chattanooga, Tenn.

June 14-15—New York Electric Railway Association, Half Moon Hotel, Coney Island, N. Y.

June 20-27—American Railway Association, Div. 5—Mechanical, annual convention and exhibit, Atlantic City, N. J.

June 21-22—American Railway Association, Motor Transport Division, Atlantic City, N. J.

June 21-22—Wisconsin Utilities Association, Accounting Section, Hotel Pfister, Milwaukee, Wis.

June 28-29—Central Electric Railway Association, Cedar Point, Ohio.

July 8-12—Public Utilities Advertising Association and International Advertising Exposition, Detroit, Mich.

July 13—A.E.R.A. Executive Committee on yacht "Florida," New York, N. Y.

July 18-20—American Society of Civil Engineers, annual convention, Buffalo, N. Y.

July 19-21—Pacific Claim Agents' Association, annual convention, San Diego, Cal.

July 25-27—Electric Railway Association of Equipment Men, Southern Properties, Cincinnati, Ohio.

July 27-28—Central Electric Railway Accountants' Association, Detroit, Mich.

Aug. 16-17—Wisconsin Utilities Association, Transportation Section, Sheboygan, Wis.

SEPT. 22-28, 1928

American Electric Railway Association, 47th annual convention and exhibit, Cleveland, Ohio.

News of the Industry

By Air and Interurban in Ohio

The Cleveland & Southwestern Railway & Light Company established a regular schedule of rail and air service connections in conjunction with the Stout Air Service, Inc., which operates a daily passenger air line between Cleveland, Ohio, and Detroit, Mich. Ten northern Ohio cities—Medina, Elyria, Oberlin, Wooster, Ashland, Mansfield, Crestline, Galion, Bucyrus and Wellington—are affected by the plan, under which through rates and service have been put into effect over the interurban lines to the Cleveland airport and thence by plane to Detroit.

The plan was made operative on May 28 when tickets for the combined rail-plane service became available at all ticket stations of the Southwestern. No additional track construction was necessary, since the interurban line runs past the airport a short distance outside of Cleveland. E. L. Hukill, traffic manager of the Cleveland & Southwestern, made the arrangements with officials of the Cleveland-Detroit air line after he had flown to Detroit and back and had become an air enthusiast. Prospective users of the new service may arrange to board an interurban, which will make connections with the planes at the airport, by consulting ticket agents in their respective towns. Two round trip flights are made a day, one in the morning and one in the evening, so it will be possible for anyone on the Southwestern lines to make a trip to Detroit in the morning, have five hours there and return home the same day.

Three-motored Ford planes each accommodating fourteen passengers are in service on the Cleveland-Detroit air line. Every possible convenience is provided. The air trip takes from an hour to an hour and a half, compared with more than four hours by rail. The Ford planes also make daily sightseeing trips of 50 miles over Cleveland. The arrangement with the Southwestern also provides for excursion rates to the airport including the sightseeing ride.

Threat of Competition in Baltimore

Linwood L. Clark, an attorney who represented one of the bodies opposed to the increased fares for the United Railways & Electric Company, Baltimore, Md., has written the Maryland Public Service Commission that an undisclosed principal is prepared to make the necessary application for the right to operate a bus system in Baltimore in competition with the United. Mr. Clark said the present purpose is to ascertain if the franchise rights of the United "are of such pre-emptive charac-

ter as to exclude a competitive city-wide bus system furnishing superior service at less cost to the public, park tax or its equivalent included."

In reply the commission, through Chairman Harold E. West, has declined to give an expression of its stand on a city-wide and suburban passenger bus service until it receives the application in regular form. Mr. West said that the

commission can only pass on specific applications regularly before it for adjudication and then only in the light of the particular facts and circumstances presented. On the facts submitted, he said, the commission would hesitate to give a categorical answer and that it would not attempt to express an opinion about the legal or other rights of the United Company in the premises.

President Thomas N. McCarter Honored

More than 600 invited to dinner to him culminating the celebration of 25th anniversary of company's founding. Optimistic over prospects of transportation unit's co-ordinated service



Thomas N. McCarter

CELEBRATION of the 25th anniversary of the formation of the Public Service Corporation of New Jersey with Thomas N. McCarter at its head as president culminated in a dinner on the evening of June 1 to Mr. McCarter at the Robert Treat Hotel. About 600 guests attended, including industrial leaders of New Jersey, state and municipal officials, prominent utility men from the Eastern part of the United States and officers of the corporation. The roster of names at the speakers' table included:

Thomas S. Gates, Col. A. R. Kuser, Samuel T. Bodine, directors of the Public Service Corporation; Percy S. Young, director and vice-president of the Public Service Corporation; E. I. Edwards, U. S. Senator from New Jersey; John B. Miller, California Edison Company; Arthur W. Thompson, president of the United Gas Improvement Company; A. Harry Moore, Governor of New Jersey; Thomas N. Mc-

Carter; Owen D. Young, General Electric Company; Edward T. Stotesbury, Drexel & Company, Philadelphia; Uzal H. McCarter, director of the Public Service Corporation; Edmund W. Wakelee, director and vice-president of the Public Service Corporation; Joseph F. Autenrieth, chairman New Jersey Public Utilities Commission; Gen. W. C. Heppenheimer, director of the Public Service Corporation; John I. Waterbury, former director of the corporation; Frank Bergen, general counsel of the corporation.

Credit is frankly given by his associates to Mr. McCarter for the work he has done in welding together the present state-wide system of electric railway, electric light and power and gas systems and directing them to their present magnificent standards, and in turn credit is just as frankly given by Mr. McCarter to the men and women in the companies of which he is the head for the part they have played in the 25-year program of progress, to which reference will be made more in detail later. Here the concern is first with the beginnings; then with the accomplishments.

Prior to the organization of the company, Mr. McCarter had attained distinction not only as a leading member of the bar, but as State Senator and Attorney General of New Jersey. He was familiar with the public utility situation existing at that time. Service was being rendered by scattered and comparatively small units. Additional money was needed for improvements and extensions. The time had come when a thorough reorganization and rehabilitation of the gas, electric and railway properties were necessary. Then the opportunity and the man met. It was Mr. McCarter who conceived the plan for bringing under one management the then scattered properties and, in collaboration with Randal Morgan and John I. Waterbury as a committee, he proceeded to develop the details of the plan which was finally put into

effect. One of the stipulations made by the men interested in the project was that Mr. McCarter accept the presidency of the new company. This he finally consented to do although it made it necessary for him to give up further practice of his chosen profession. As Edmund W. Wakelee, vice-president of the company, has expressed it, during these twenty-five years there have been many problems to be solved, many adverse conditions to be overcome, but through good times and bad times, in prosperity and in adversity, President McCarter has supplied the energy, courage and directing force necessary to carry out his plans and make his vision a reality. And all this time Mr. McCarter has played a most important part in shaping the national destiny of the industries included in the New Jersey corporation's activities, particularly in the electric railway industry, in the councils of which he has been a factor since first he entered the utility field.

Mr. McCarter's message to his associates follows:

In this, the 25th anniversary of Public Service, I extend my personal and official greetings to each member of the Public Service staff.

During its existence of a quarter century, Public Service has constantly expanded electric, gas and transit facilities and is today justifiably proud of the three great utility systems which are so adequately serving the people of New Jersey.

It is no less proud of the splendid organization of men and women which operates, maintains, expands as increased demand requires, and gives life to these physical properties. To the intelligent, faithful and efficient efforts of this Public Service family, the success of the enterprise and the complete and dependable service that it provides are in large measure due.

I am profoundly grateful for the loyal support that the organization has given me as its chief and it is with feelings of personal gratitude that I extend to its every member the thanks of the officers of Public Service and express their appreciation of services rendered. Please accept my best wishes for your health and prosperity.

CELEBRATION A COMPANY EVENT

While the dinner to Mr. McCarter overshadowed other events in connection with the celebration of the twenty-fifth anniversary, still it was just one of a number of events in connection with the present occasion. On May 22, in the directors' room in the Newark Terminal, an oil portrait of Mr. McCarter was unveiled. The portrait was done by John Christen Johansen of New York, who was commissioned to do the work following an announcement of the proposed presentation, Oct. 20 last, at a dinner to Mr. McCarter, by the Public Service organization on the anniversary of his sixtieth birthday.

Since the organization of the company, 1903, more than \$163,000,000 has gone into additions to and extension of electric facilities.

Since 1903, more than \$59,000,000 has gone into additions to and extension of gas facilities.

Since 1903, some \$71,000,000 has

gone into additions to and extension of transportation facilities. Public Service Corporation has not hesitated to add to an already extensive and complete railway system, a complementary motor bus service which is already one of the most extensive in existence. The 378 miles of railway track which Public Service took over in 1903 have been increased to 878 miles, while there have been added to the equipment available to serve the public 1,800 street cars and 1,400 motor buses.

Mr. McCarter said recently:

Confidence in the state's future development, growth and progress led in the first place to the organization of Public Service and is still a guiding principle of those who have its affairs in their charge. We are planning and building now so that Public Service will be in a position to meet all demands for service as they will be made in the coming years. Within the last twelve months we have entered into an agreement with neighboring electric companies for the formation of the world's largest power pool which assures to New Jersey an ample supply of electric power, capable of expansion to meet future requirements.

As Mr. McCarter sees it, there is no problem more vital as affecting the interests of New Jersey than that of adequate and convenient local transportation and the solution of no similar problem is fraught with more difficulties. But his remarks left no doubt about the character of the accomplishments of the company in this particular sphere of its activities. There appeared to be no mistaking the fact that Mr. McCarter feels that a solution of the problem is possible and best of all that it is near.

"No Parking" Decreases Number of Accidents in Chicago

A study of accident reports recently completed by traffic engineers of the Chicago Surface Lines indicates that since Jan. 10, when the no-parking ordinance became effective in the downtown district of Chicago, Ill., there has been a decrease in accidents involving street cars of approximately 30 per cent. This decrease is credited to the greater facility with which cars now enter the Loop district and to the reduction in the number of collisions between automobiles and street cars which were due to the maneuvering of automobiles into and out of parking spaces.

An ordinance recently passed by the City Council which would have prohibited all mid-block or "U" turns on downtown streets, was vetoed recently by Mayor William Hale Thompson. The Mayor explained his action by saying that he had received many protests against the measure and that he had been informed that the ordinance was illegal. It is understood that the ordinance will be referred back to the traffic committee of the City Council and submitted to the corporation counsel for an opinion with regard to its legality.

Decision Reserved on Philadelphia 5-Cent Fare Suit

A special Federal Court of Equity, composed of Circuit Court Judge Davis and District Judges Dickinson and Kirkpatrick, reserved decision on a motion by two taxpayers to restrain the Philadelphia Rapid Transit Company, Philadelphia, Pa., from collecting more than a five-cent fare pending a final decision by that court in the case. The suit is for recovery of \$79,800,000 in excess fares over the five-cent base fixed in the 1907 Philadelphia Rapid Transit-city agreement. Complainants contend that the Public Service Commission and fare rulings of that body are unconstitutional.

A somewhat similar suit was dismissed by Federal Judge Dickinson in June, 1926.

Covington Company Seeks Fare Increase

A proposal to increase fares in the Northern Kentucky communities from 5 cents to 10 cents cash, with an 8½-cent ticket rate, was made by H. C. Blackwell, president of the Cincinnati, Covington & Newport Railway, at a joint meeting of Kentucky city officials on May 23. The franchises under which the company now operates are perpetual. Most of them stipulate a 5-cent fare.

Mr. Blackwell pointed out that the sale of merchandise of any kind at cost or below cost would result only in disaster to the business to the discomfort of all who depend on it. Among other things he said:

The citizens of Cincinnati, confronted with practically the same conditions as exist in the Kentucky communities, met and solved the problem in the course of a reasonable time. Not only are the city streets there something to be proud of, but so is the railway. Street railway equipment, both rolling stock and tracks, under a proper rate of fare, can be kept in the condition they should be; and when additional or better service is needed, it can be supplied.

Everyone knows that it is impossible to operate under a 5-cent fare and as support for this statement all we need do is to accept the word of the Cincinnati city officials who have found that the service-at-cost plan requires a 10-cent cash fare for single-trip passengers, or three tickets for 25 cents. Every expense encountered by the Cincinnati Street Railway has its parallel for the Kentucky company, and we have an additional expense in the toll charged for crossing the Ohio River.

Mr. Blackwell said he knew of few other communities where a 5-cent fare is in existence. He was not asking the city officials, upon their return to their various cities, to authorize an increase in fare, but to give the matter most serious consideration, together with the promise from him that with the adoption in the Kentucky communities of the fare now being charged in Cincinnati would come increased service, where necessary, and reduced rates for current in Kentucky, thereby benefiting the entire community.

New Franchise Ordinance in Toledo

**Provides for bus monopoly by Community Traction Company.
Power rate reduced and fares to remain as at present.
\$560,000 rehabilitation program**

A NEW ordinance in the form of a contract with the Community Traction Company, its ownership as represented by the Toledo Traction, Light & Power Company, and the city of Toledo, Ohio, supplementary to the present Milner franchise, has been introduced into the City Council by Mayor William T. Jackson and is now being studied. Along with the ordinance the Mayor filed a letter explaining the provisions of the plan worked out largely by Commissioner E. L. Graunlich and David H. Goodwillie, member of the street railway board of control, in conference with representatives of Henry L. Doherty & Company, and whipped into legal form by city and company attorneys. He also transmitted an agreement between the Toledo Edison Company and the Community Traction Company relative to a reduction in the power rate, an agreement on the part of the company to keep step with the city on its paving program for a period of five years, and a program of extensions and betterments to service, including fourteen new bus routes requiring 104 new buses.

In the new ordinance the railway is granted a virtual monopoly of bus operation, since any independent line is prohibited within a quarter mile of a company railway or bus route. Under this provision it will be the policy of the railway to purchase equipment of existing lines at a fair appraisal as determined by a board named by Mayor Jackson. The bus operators have no franchise rights in the streets and have not been subject to city regulation. In the banning of motor coach operations within limits the new ordinance specifically exempts taxicabs, which have recently put into effect a 50-cent flat rate within city boulevard limits.

Among the important features of the new plan to supplement the Milner ordinance are the following:

The power rate will be reduced to a basis that will save the company \$150,000 in the next five years. It will be readjusted periodically to conform to costs of coal. The Toledo Edison Company will also rebate \$150,000 in 60 monthly installments of \$2,500 each on account of power charges in recent years.

The Community Traction Company will pay the city an old paving claim amounting to \$270,000 in which interest is included. It will also pay the city \$10,000 expended in transit surveys, pay a claim for an attorney who represented the board of control in power litigation, and some other minor claims.

A five-year rehabilitation program is set up and it will require expenditure of about \$560,000 to be furnished by the Toledo Traction, Light & Power Company, now owning the major portion of the company securities. Of this money

\$185,000 will be available the first year, \$181,000 the second year, \$57,000 the third year, \$119,000 the fourth year and \$18,000 the fifth year. During the five-year period covered by the ordinance the company will make replacements amounting to \$230,000 with \$120,000 available the first year, \$60,000 the second year and \$50,000 the third year. This will afford the company a chance to replace worn-out equipment in the next three years.

A loan fund of \$30,000 is authorized to make a down payment on bus purchases. Probably more than 100 new coaches will be purchased if the plan becomes operative.

The Community Traction Company now is obligated to its owners for about \$900,000, which is substantially the amount of the deficit in the stabilizing fund less the original \$400,000 in that fund at the time the Milner ordinance went into effect. Interest and payment of principal on this loan are to be suspended for a period of ten years unless the agreement with the city of Toledo is terminated earlier. By reason of this fact the rate of fare would be subject to reduction in case the stabilizing fund reaches \$500,000.

Railway fares will remain as at present. This will mean that all bus fares will be reduced slightly. The fare scale now is 10 cents cash, three tickets for 25 cents, and 1 cent for transfer. Buses operated by the company have been bringing a straight 10-cent fare with 3 cents for transfers.

The company will put in three new crosstown lines, conforming to general recommendations of the Milner ordinance, and eleven other routes substantially extensions to lines as contemplated under a general revision of the system provided for in the franchise.

Adoption of the ordinance agreement will also restore to the City Council control of service by suspending the deficit in the stabilizing fund.

In his letter to the City Council Mayor Jackson explained the present plan, indorsed it and recommended that it be studied carefully by individual members of the Council. He said:

It is my opinion that the proposed agreement is in every respect fair to the city. It makes possible better service by the co-ordination of the railway and bus lines. In other words, it contemplates a complete transit system for the entire city at a rate of fare governed by the service-at-cost features of the present franchise. The agreement would not bind the city for a period longer than five years, and if at the expiration of that period further concessions by the company are needed the city will be free to negotiate with the company. If at that time negotiations are of no avail the City Council can make arrangements for other bus service.

The ordinance is nullified if either party fails to live up to the agreement.

If the city fails to prohibit independent buses the financing concessions would be sacrificed, and if the company did not perform its covenants the city could bring in competing bus lines.

Chicago to Vote on Three Transportation Problems

As a result of the filing last April with the Cook County Election Commissioners of petitions asking for a referendum vote on certain questions concerning the local transportation problem in Chicago, Ill., three major proposals will appear on a ballot at the judicial election to be held in Chicago and throughout Cook County on June 4. The petitions, which carried a total of more than 300,000 signatures, were filed by a group of local civic and improvement organizations and others interested. The questions are:

1. Shall all legislation enacted by the Legislature and all ordinances passed by the city of Chicago pertaining to Chicago local transportation or subways be first submitted to a referendum of the voters of Chicago before becoming effective?

2. Shall the City Council of Chicago refuse to pass any ordinances which have for their purpose the use of the traction fund to build downtown subways?

3. Shall the city of Chicago proceed without delay to provide transportation where the present facilities are inadequate or lacking, particularly in the outlying districts, by the use of pneumatic-tired buses, the necessary expense to be paid out of the traction fund?

Surface-Car Subway in Philadelphia Approved

The Locust Street ordinance, passed by the City Council of Philadelphia, Pa., was signed by Mayor Mackey on May 16. This appropriates \$10,000,000 of loan funds toward the construction of the Locust Street surface car subway. The \$10,000,000 fund authorized will be drawn upon by the Philadelphia Rapid Transit Company for the initial construction of the \$40,000,000 subway. Under the city-company agreement, passed by the Council and signed recently by the Mayor, the transit company is empowered to enter into contracts for the building of the line. The Philadelphia Rapid Transit Company has agreed to meet the fixed charges on the money borrowed by the city for the work, and when the project is paid for, title will remain vested in the city.

The ordinance declaring the city's intention of acquiring the holdings of the underlying systems of the Philadelphia Rapid Transit was also approved by the Council. This legislation will enable the city Administration to petition the Public Service Commission for a valuation of the underliers' franchises. It has been estimated that the holdings can be purchased for \$136,000,000 and it is believed the city can save \$4,500,000 a year for itself by substituting itself as lessor of the underliers' franchises and collecting the rentals now paid those systems by the Philadelphia Rapid Transit Company.

California Commuters to Pay Higher Fare

Monthly ferry commutation rates on the Key System Transit and Southern Pacific Lines have been increased by the California Railroad Commission, but existing local railway rates and single-trip ferry fares remain at 7 cents and 21 cents respectively. Commuters from Oakland, Alameda, Berkeley and Piedmont will pay \$6.50 for monthly tickets instead of \$5.20, and those from other Bay points on the Oakland side \$7 effective July 1. The companies had asked for 10-cent local fares and a 25-cent single ferry fare.

Commissioner Clyde L. Seavey wrote the opinion for the commission, which was supported by Commissioners Thomas S. Loutitt and Leon O. Whittsell. Dissenting opinions were filed by Commissioners W. J. Carr and Ezra DeCoto, both of whom, however, voted for the rate increase.

Messrs. Carr and DeCoto held that it is unfair to throw the burden of supporting an unprofitable street railway upon the shoulders of the commuters. They expressed the belief that increased rates would not solve the difficulty when traffic fell off as rates went up. Mr. Seavey charged that the Key System had not co-operated with the commission in trying out the experimental 5-cent fare zone plan ordered last November on recommendation of A. O. Mott, the commission's chief engineer. The company obtained a rehearing on the ground that 5-cent fares would bring bankruptcy. The commission sustained the contention of the companies that they are not getting a fair return on their investment, that the Southern Pacific operates its ferry and suburban service at a loss and that the Key System makes a small profit. Further, that buses and private autos are cutting into the business.

Mr. DeCoto's opinion is that the Key System would have been better off if the traction fare had been kept at 6 cents and not raised to 7 cents. He sees rigid economy as the only hope and recommends that competitive operation of parallel lines be eliminated by the companies.

Improvements on Illinois Traction Approved in St. Louis

The attitude of the St. Louis, Mo., city administration toward the \$5,000,000 terminal improvements for the Illinois Traction System was indicated May 22 when the Board of Public Service unanimously approved a proposed ordinance vacating certain streets to permit the construction of the contemplated new freight and express office building at Twelfth Street and Lucas Avenue. The company has applied to the Board of Aldermen for a new 50-year franchise permitting the construction of the new terminal, subway and elevated lines.

Advantages to be gained by St. Louis through the project as outlined by D. W. Snyder, executive vice-president



Silver street car awarded to Lincoln Division employees of the Chicago Surface Lines for their meritorious work in accident prevention. The trophy is on display at the Women's World Fair, now in progress in Chicago

of the company, are: The building up of the entire northeastern section of St. Louis with an increase in property values and tax returns; a 50 per cent increase in passenger service over the Illinois Traction System into St. Louis and the bringing to St. Louis of shoppers who now patronize smaller towns in Illinois; a reduction in running time of from 30 minutes to one hour; halving commuter service between St. Louis and nearby Illinois towns and a \$250,000 increase in freight traffic.

One Carfare in St. Louis

Universal service throughout the entire city zone area for the price of a single carfare is now offered in St. Louis, Mo., by the St. Louis Public Service Company. This policy became effective with the granting by the Board of Public Service of a permit to the company to extend its South Grand Avenue line by means of buses. Patrons can now ride between any point within the city zone area and Carondelet Park and from Carondelet Park to any point reached by the system for one carfare. Application has been made for assignment to the St. Louis Public Service Company of the permits to operate buses on the streets of St. Louis now held by the St. Louis Bus Company, which has been affiliated with the railway. The differential of 2 cents and 3 cents charged for transfers between cars and buses will be wiped out.

Believe Higher Fare Needed by Capital Traction

Intimating that the Capital Traction Company, Washington, D. C., would seek an increased rate of fare soon after the adjournment of Congress, members of the Public Utilities Commission calculated recently that a 10-cent cash fare or six tokens for 50 cents probably would be necessary to give the company

a fair return on its valuation of \$26,750,000. The present rate of fare is 8 cents cash or six tokens for 40 cents. The company earned in 1927 only 3.8 per cent on this valuation.

Texas Property Goes Into Freight Business

The Texas Electric Railway, Dallas, Tex., handled its first carload of freight through its Italy connection with the Missouri Pacific on May 22. The car was turned over to the electric railway by the Texas Power & Light Company at Waco and moved via the electric railway line to Italy, thence by Missouri Pacific to Fort Worth, and by the Texas & Pacific to Odessa, its destination. The Texas Electric Railway staged a ceremony at Waco and there was a similar ceremony at Italy.

The company has gone into the freight business under an order issued by the Texas Railroad Commission. It is understood that later the electric railway will apply to the Interstate Commerce Commission for permission to handle interstate freight, thereby becoming, if its plea is allowed, an electrically operated railroad, with full freight interchange agreements with the steam railroads. Since the Missouri Pacific does not now enter Dallas direct, it now obtains an entrance of this kind via the electric railway. It is understood that the change means the provision of increased terminal facilities by the electric railway at Dallas and the purchase by it of electric locomotives for handling freight.

Eight-Cent Fare Sought in Rome

A petition for increased fares has been filed with the Georgia Public Service Commission by the Rome Street Railway, Rome, Ga., and set for hearing on June 12, 1928. The company is a subsidiary of the Georgia Power Com-

pany. It seeks to establish an 8-cent fare in place of a 6-cent fare now in effect; to sell two tickets for 15 cents, and to establish a 4-cent fare for school children instead of the present 3-cent fare.

According to the petition, the present rate schedule does not permit the company to obtain a fair return on its property investment.

Safety Winners in Rochester Dine on Turkey

It pays to play safe in Rochester, N. Y.—at least for operators of the New York State Railways. Fifty employees of the Main Street car line, winners in the annual safety contest, were honor guests of the railways at a turkey dinner at Hotel Seneca. This line ran 7,396 miles throughout the year for every accident point scored against it. City Safety Commissioner Nier was the speaker at the banquet.

Besides the annual competition between employees of lines, a monthly contest among divisions is held with a banner and a dinner as the award. Right now the Portland Avenue division holds the flag. Back of all this Leon R. Brown, safety director, has a carefully prepared plan to cut down accidents.

Public Responsible for Transportation System

Victor Murdock, publisher of the Wichita, Kan., *Eagle*, who served many years in the House of Representatives and has been a world traveler and speaker, in a recent editorial declared that the public must share responsibility for good or bad transportation in Wichita. He was especially urging a better rate of fare. His ideas were:

Lack of an adequate transportation system fare must necessarily curtail maintenance and extension. Without an adequate fare the entire growth of Wichita will be undermined. It is your responsibility to see that Wichita transportation lines are maintained and extended. It is your responsibility to see that the transportation company is granted a rate sufficient to maintain and surpass its present service. Without an increased rate, transportation will suffer—without transportation the growth of Wichita will suffer.

Charter for Rockford- Freeport Line

The Rockford-Freeport Railway has been organized to continue the interurban line from Rockford, Ill., to Freeport, 27 miles to the west. It is controlled by the Central Public Service Corporation, Chicago, an affiliated company with the Rockford Electric Company. This road was formerly a part of the Rockford & Interurban Railway system. It will be operated by the Rockford Electric Company in conjunction with the line running to Beloit, Wis. The interurban line running east from Rockford to Belvidere and Elgin is not a part of the Rockford Electric system.

Recent Bus Developments

Buses Run at 15 Cents in Kansas City

Following a vote of the City Council of Kansas City, Mo., on bus changes of the Kansas City Public Service Company, authorizing rerouting and a fare increase on trunk lines to 15 cents, buses started operating under this franchise for a trial period of six months, beginning June 1. The permit then will be ended or renewed, according to the findings. The new permit allows bus fares of 15 cents on all trunk lines in contrast to the former 10-cent fare. Five trunk lines and seven feeder lines are approved by the Council, in place of five trunk lines and six feeder lines.

The ordinance allowing revision of the bus system for a trial period was enacted after three hours of discussion and the introduction of seven amendments, two of which carried. The body approved the 15-cent fare on buses in the belief that the trunk lines were luxuries, paralleling the street car lines, and that tram patrons should not be penalized to support the buses.

Two amendments introduced by Mayor Beach, containing provision of the present bus franchise, but which were not incorporated in the new one, were approved unanimously. One provides that the railway must pay the city 1 cent on each gallon of gasoline purchased when the vendor does not pay the 1 cent city tax, the money to be used for upkeep of the streets on which buses operate. The other absolves the city from blame in bus accidents caused by the buses encountering defects in the streets.

The appeal of the company for relief was based on the report reviewed in the JOURNAL for May 26, page 875.

Substitution Sought by New York City Line

Representing that it may be only a matter of days before the Eighth & Ninth Avenue Railway, New York, will have to cease operation for want of revenue, the company's receivers and their attorney appeared on May 21 before the committee of the whole of the Board of Estimate to urge conversion of its perpetual railway franchises into a franchise for the operation of buses.

The receivers described the company as unable to make operating expenses with its present equipment. Its bank balance they said, was only \$300, and for many weeks the receivers and their friends have had to advance cash to meet current operating expenses. Unless some measure of relief is afforded, the receivers said, the company would shut down, operating only one car a day to retain its franchise.

The lines of the Eighth & Ninth Avenue Company run from Fulton Street

up West Broadway to Canal, along Hudson Street into Eighth Avenue and from the Battery to Gansevoort Street and then up Ninth Avenue to Broadway and 65th Street, then along Broadway to West 72d Street, then up Amsterdam Avenue to La Salle Street and Broadway, all in the borough of Manhattan.

Results in Indianapolis Do Not Reflect Co-ordination

Net operating revenues in 1927 of the People's Motor Coach Company, now owned by the Indianapolis Street Railway Company, Indianapolis, Ind., were only \$17,144. The revenue last year would indicate a 3.4 per cent return instead of an 8 per cent return on the valuation at which the properties were taken over.

Passenger revenue in the year was \$459,379, while \$1,459 was realized from rentals on charter buses and \$2,594 from advertising, making a gross of \$463,433. Operating expense, exclusive of depreciation charges, was \$348,801. The depreciation charges, at the rate of 15 per cent a year on motor equipment, were \$97,487. Had the depreciation charge been 30 per cent a year as demanded by the Public Service Commission, there would have been a deficit of about \$79,000.

Over its five routes in the city, the company carried 4,274,340 passengers. Its 39 buses traveled 2,375,566.6 miles in the year. These of course, were results that do not reflect the full program for the operation of the system in co-ordination with the street railway.

In showing assets and liabilities balancing at \$554,985, the report placed a value of \$314,269 as estimated investment at the beginning of the year. The figure, however, corresponds to the original purchase price for the 39 buses without depreciation for one, two and three years on the equipment.

Out of the earnings of the coach company, the Indianapolis Street Railway had expressed the expectation that, with the services properly co-ordinated, it could meet interest charges and amortize a \$500,000 loan made at 8 per cent to supply funds to finance the purchase of the bus company's common stock.

Injunction Against Muncie Buses

Judge Robert C. Baltzell of the southern Indiana district of the federal court has issued an injunction against the operation of buses in Muncie, Ind., by Sumner L. Denny and others who were defendants in a suit brought by the Equitable Trust Company, New York, trustee for holders of bonds secured by mortgages on property of the Union Traction Company.

The suit was predicated on the assertion of the plaintiff that the defendants, in the operation of their bus lines

under a license issued by the city of Muncie, had failed to obtain a certificate from the Public Service Commission, showing that their lines were of public convenience and necessity. A decree in support of the injunction was entered with the clerk of the court.

Attorneys for the defendants asserted they were unable to say whether they would take an appeal to the Circuit Court of Appeals in Chicago because a motion asking for a stay of an injunction obtained against the defendants in circuit court by Arthur W. Brady, receiver for the traction company, is to be heard soon by the Indiana Supreme Court.

Approve Abandonment of Short Run in New Jersey

Approval of the application of the Coast Cities Railway to substitute bus for railway service between Belmar and Manasquan, N. J., has been announced by the New Jersey Board of Public Utility Commissioners. It was contended that the railway lines had been operating at a loss for the past two years. Bus service is now supplied by the railway between Atlantic Highlands and Manasquan, skirting the coast for the most part and routed through Asbury Park, Avon, Belmar, Spring Lake, Sea Girt and other places. This operation by bus was the subject of a descriptive article contributed to *ELECTRIC RAILWAY JOURNAL* for Dec. 12, 1925, page 1023, by H. T. Pritchard, vice-president of the Utilities Power & Light Corporation.

Express Service Suggested at Indianapolis

Mayor Slack of Indianapolis, Ind., has suggested that city and electric railway officials prepare a program for rapid transit in keeping with expected growth of the city. The Mayor believes elevated lines from the business district to Broad Ripple, thence to Fairview and Riverside, are the eventual solution. James P. Tretton, operating superintendent of the Indianapolis Street Railway, believes that the city of the future will use subways. The railway recognizes the need for faster rides from the extreme north and east sections of the city to the business district. Express service, like that in Detroit using buses and trolleys, has been suggested as a means of immediate relief.

Would Extend Bus Service

Application has been made by the St. Louis Public Service Company, St. Louis, Mo., to the Board of Public Service to install a new bus line to supplement the Tower Grove Street car line. The buses will run from the end of the street car division into the Lindenwood district which is now served only by buses of the People's Motorbus Company and suburban trains.

Special Service in British Columbia

The British Columbia Rapid Transit Company, subsidiary of the British Columbia Electric Railway, has started an additional coach service between Vancouver and Abbotsford on Saturdays and Sundays only.

50 Miles of Route for Third Avenue Railway

The Surface Transportation Corporation, with other companies of the Third Avenue Railway System, New York, has acquired and is already operating nearly 50 miles of bus routes in Westchester County, including the White Plains-Yonkers line, the Harrison-Rye Beach line, the Mamaroneck Avenue line, the White Plains-Tuckahoe line, the Silver Lake line, the White Plains-Hastings line, and the White Plains-Grasslands line. The new Bronx lines will add 55 route miles, making a total of more than 100 miles of bus routes which will have been added to the system.

These and other facts were brought out in a radio talk made recently by Garrow T. Geer, secretary of the company. He also said:

The bus companies have been fortunate in obtaining unusually desirable and well qualified men for the bus operating personnel, and the inspiration of new buses, new uniforms, a clean slate, and a magnificent opportunity for transportation service, is a challenge to the new employees to give the public their very best efforts.

It is a great satisfaction to the Third Avenue management that to us has been awarded the opportunity of affording this new service to the people of the Bronx, who for so many years have been the patrons of our railway lines. We feel that they will appreciate the advantages of a co-ordinated bus and trolley service under one management, the financial and operating reliability of which has long been established.

Line in Washington Authorized

The Capital Traction Company, Washington, D. C., has been authorized to operate a parlor car coach line between 34th and Ordway Streets and 10th and D Streets, northwest. Such service can be operated until otherwise ordered by the commission.

Substitution Being Considered for Lake Ontario Route

Stockholders of the New York State Railways will meet in Rochester, N. Y., on June 14 to consider the proposed early abandonment of the Rochester & Sodus Bay Railroad. James F. Hamilton, president has stated that revenues of the 40-mile line along Lake Ontario and through the lake fruit belt have decreased steadily. He reported a loss of nearly \$50,000 for the year 1927 after operating expenses and taxes. Depreciation was not included in this computation.

The single-track interurban is a subsidiary of the New York State Railways and its revenues have been hard

hit by the private automobile. There is no competing bus line, but it is understood that the New York State Railways may substitute a bus line.

New Iowa Interurban Service

Buses between Davenport and Clinton, Iowa, operating on a staggered schedule with the present interurban cars between the two cities, operated by the Clinton, Davenport & Muscatine Railway, will be in service early in July, according to R. J. Smith, general manager of the Tri-City Railway, an associate company. Formal application for the permit was made recently. This is the first interurban coach service to be undertaken by the railway.

Taxi Purchase Contemplated by New Jersey Company

Negotiations are under way, according to the *Newark News*, for the purchase by Public Service Co-ordinated Transport of the Yellow Cab Company, Camden, N. J., which operates 47 taxicabs. The price reported is between \$400,000 and \$500,000. The Public Service has not heretofore embarked upon the taxicab business. The company at Camden, in addition to the cabs, has a large garage and a two-story office building.

Supplementary Service on One Denver Line

A bus will be used along the route of the Denver and Crown Hill line of the Denver Tramway from the city limits of Denver, Col., to the Crown Hill Cemetery, about 1 mile, to supplement the car service. Nothing has been said about discontinuing the car line, but it is understood that if the bus proves satisfactory the company has the right to substitute buses. Recently the company has refused transfers between the city line and the Crown Hill line.

New Line Out of Washington

The Washington Railway & Electric Company, Washington, D. C., may establish a bus line from a mid-city terminal to Rockville, Md., to compete with the existing bus line operated by the Montgomery Motor Bus Company, Inc. It was said the Montgomery Bus Company had been making serious inroads on the patronage of the Rockville line of the railway and the railway company considers it imperative to take such steps, since negotiations entered into by it to take over the Montgomery company have apparently failed.

Would Extend Line in Los Angeles

The Los Angeles Railway Corporation has applied to the California Railroad Commission for a certificate to extend its Florence Avenue coach line in the County of Los Angeles.

Financial and Corporate

Senator Capper Heads Merger Sub-committee at Washington

The Senatorial sub-committee that is to investigate the merger plan, under which it is proposed to bring together the Capitol Traction Company, the railway lines of the Washington Railway & Electric Company and the Washington Rapid Transit Company, has been appointed by Senator Capper, Republican, of Kansas, chairman of the Senate District committee. Mr. Capper himself will head the sub-committee. The other members will be Senators Blaine, Republican, of Wisconsin; Vandenberg, Republican, of Michigan; King, Democrat, of Utah, and Glass, Democrat, of Virginia. It is probable that the committee will assign utilities experts to investigate the merger plan and then come back in the fall to hold hearings.

Authorization for the investigation was contained in a resolution adopted by the Senate. The resolution appropriated \$10,000 for expenses.

Four members of the sub-committee, Capper, Blaine, Vandenberg and Glass, voted against a proposal to make a favorable report to the Senate on the joint resolution authorizing the merger. The fifth member of the sub-committee Mr. King, voted in favor of the motion.

The question of valuation will be the most important one in the sub-committee's investigation. The merger plan allows a fixed valuation of \$50,000,000, against a valuation of \$62,000,000 claimed by the two railways for their properties under the basis allowed by the Public Service Commission in previous cases.

First Report on Consolidated Georgia Properties

The first annual report of the consolidated Georgia Power Company, Atlanta, Ga., has been presented for the purpose of showing the progress made in simplifying the corporate and strengthening the financial structure of the company since its organization on Feb. 25, 1927. It summarizes the efforts made and results attained in co-ordinating, standardizing, and unifying the facilities of the several constituent companies. No detailed comparison is made in this report with the consolidated operations of the properties for the previous year, although the report and the Year Book contain charts and statistics showing the growth and development of the company.

Gross earnings from railway operations were \$5,367,510 and passengers carried numbered 99,340,678. Of this number 94,983,871 were carried on the Atlanta system.

The year 1927 witnessed the consummation of a program of complete modernization of the Atlanta railway system. Modern double-truck cars were

used to replace all of the old single-truck cars retired from service, with the exception of 26 retained for emergency use. The present equipment includes 407 regular passenger cars, of which 154 are equipped for one-man operation.

Stock Offerings in Montreal

An offering of stock will be made to shareholders of the Montreal Tramways, Montreal, Canada, at \$150 a share on the basis of one new share for each five shares held. The present offering means that 10,000 new shares will be offered to shareholders, and at \$150 a share will give the company \$1,500,000 of new money to be used for general expansion purposes.

This change in the Montreal Tram capital structure will strengthen the position of United Securities which, through Consolidated Securities, Ltd., owns more than 50 per cent of the common stock of the tramways.

At current levels, rights will be worth about \$10 each.

Properties Separated in West Virginia

Separation of the railway and lighting properties in Bluefield and Princeton, W. Va., has been effected following an announcement to the effect that the Tri City Traction Company, an interurban, would operate the railway and the Princeton Power Company would handle the electric light systems. All debts incurred by the Princeton Power Company prior to April 30 are to be settled by the traction company and matters pertaining to the electric light system will be under a new corporation, which will continue to be known as the Princeton Power Company, operated as a subsidiary of the American Gas & Electric Company.

Officers of the new company are as follows: S. J. Evans, president and general manager; H. E. DeJarnette, vice-president and chief counsel; S. J. Evans, in charge of railway operations; W. D. Shuff, secretary and treasurer, and E. T. Evans, head of rolling stock.

Two Chicago Issues

The Chicago, North Shore & Milwaukee Railroad received authority from the Illinois Commerce Commission on May 22 to issue and sell \$2,700,000 par value of its 6 per cent non-cumulative preferred stock. At the same time, the commission entered a formal order authorizing the Chicago Rapid Transit Company to issue under its first mortgage an additional \$3,122,000 of first and refunding mortgage gold bonds, payable in 1953 and bearing interest at 6 per cent to be sold at not less than 80.

Tax Relief Sought for Municipal Railway Employees

Employees of the Detroit Water Board and Department of Street Railways in the future will not have to pay income taxes under an amendment adopted by the Senate. Senator Arthur H. Vandenberg sought to make the exemption retroactive for the years 1925, 1926 and 1927, but this proposal was defeated. If the amendment is accepted by the house and the conference committee on the revenue bill, it will end a controversy extending over several years between the Detroit municipal government and the bureau of internal revenue.

Employees of these two municipal projects were assessed taxes as early as 1923, but these levies were abated by the revenue act of 1924. Taxes since that date have been in abeyance and a ruling of the treasury department in February of this year ordered these employees to pay up three years back taxes.

Changes on Akron Directorate

Wendell L. Wilkie has become a director in the Northern Ohio Power & Light Company, Akron, Ohio. He succeeds the late E. W. Moore, Cleveland, who with his associates founded the Cleveland-Akron interurban line. As a member of the law firm of Mather, Nesbitt & Wilkie, he has been in charge of the legal work of the Akron property for the past six years.

R. P. Stephens, New York, also has been chosen a director. He takes the place of John C. Weadock, New York, resigned.

New Directors in Oakland

Four new directors have been added to the board of the Key System Transit Company, Oakland, Cal., to fill vacancies occasioned by resignations. The new directors are the four operating vice-presidents of the company: J. P. Potter, operations; H. P. Bell, engineering; C. C. Vargas, finance; and Paul Goldsmith, public relations.

Service Discontinued in Boise

The Public Utilities Commission of Idaho granted permission on the application of the Boise Valley Traction Company, Boise, and the Colonial Trust Company of Pennsylvania to abandon its entire service on and after May 17, 1928. On that date the properties of the railway were sold by special master to John L. Porter, Pittsburgh, who represented the bondholders of the company. This sale was in pursuance of a decree of foreclosure entered by the Federal Court for the District of Idaho on April 12, 1928, this proceeding being brought to foreclose a deed of trust to the Colonial Trust Company and a mortgage of the Idaho Power Company, also the owner of the stock of the railway, against the Boise Valley Traction Company's property.

Slight Decrease in Louisville Balance

Interesting review of situation in Southern city. More extensive co-ordination ahead. Many notable achievements in realm of operation

DURING the year 1927 there was a marked increase in the density of traffic on the Louisville Railway, Louisville, Ky., during the so-called rush hours. This was met in part by the operation of 118,770 additional car miles during the year, but the relative increase in traffic during the rush hours was very great. The number of passengers carried during the other hours of the day, on the contrary, fell off considerably, so that the problem of furnishing sufficient equipment in rush hour service became extremely acute. The maintenance department functioned so well during the year that the number of cars taken from service on account of car failure was decreased 7.2 per cent compared with 1926, and 16.4 per cent compared with 1925.

In an effort to reduce service inter-

COMPARATIVE INCOME STATEMENT OF THE LOUISVILLE RAILWAY

	1927	1926
Operating Revenues:		
Revenue from transportation...	\$4,608,732	\$4,665,693
Other operating revenues.....	203,462	197,612
Total operating revenues...	\$4,812,195	\$4,863,305
Operating expenses.....	3,260,563	3,275,786
Net revenue from operations	\$1,551,631	\$1,587,518
Taxes.....	461,000	461,000
Railway operating income...	\$1,090,631	\$1,126,518
Bus operating income.....	*85,977	*31,566
Total net operating income	\$1,004,654	\$1,094,952
Non-operating income:		
Louisville and interurban railroad.		
Net income.....	73,910	82,903
Other non-operating income...	9,607	10,228
Total non-operating income	\$83,517	\$93,131
Gross income.....	\$1,088,172	\$1,188,083
Deductions from gross income:		
Interest on bonds and notes...	651,750	651,750
Miscellaneous debits.....	4,928	2,025
Total deductions.....	656,678	653,775
Balance available for dividends on stock.....	\$431,493	\$534,308

*Deficit.

ruptions to a minimum considerable study was devoted to the traffic situation. Early in the year the supervisory force was revised in an effort to insure more regular schedules. Three additional line inspectors and two supervisory inspectors were added to the

RECORD OF AUTOMOBILE LICENSES ISSUED IN JEFFERSON COUNTY

	1923	1924	1925	1926	1927
Trucks.....	6,250	7,400	8,063	8,610	8,449
Passenger automobiles.....	29,891	40,916	46,379	50,034	51,500
Motorcycles.....	.....	235	247	249	302
Dealers.....	.....	88	97	105	90
Free.....	.....	.....	.....	325	416
Total.....	36,141	48,639	54,806	59,323	60,757

transportation department staff, the latter two being provided with an automobile to enable them quickly to reach any part of the system and render assistance during interruptions to traffic. This materially reduced the length of interruptions to service.

Despite the increase in car miles operated during the year, despite the decreased failure of cars in service, and, despite the fact that there was no change in fare during the year, 1,250,249 fewer passengers were carried in 1927 than in 1926; and, 1,729,954 fewer passengers than in the year 1925. Increased buses were placed on the operation by reason of the increased number of automobiles and trucks operated, and a considerable program of sewer construction, all of which tended to increase the difficulty of operating cars on regular schedule. Industrial depression was reflected in the company's earnings, which show a decrease of \$51,109 compared with 1926.

There were 1,400 more automotive vehicles on the streets of Louisville during 1927 than in 1926; and, some five thousand more than in 1925. The number of automobile licenses issued in Jefferson County during the past five years is compared in the accompanying compilation.

Early in 1926 the Mayor appointed a traffic committee to review the entire traffic situation in Louisville. On Aug. 18, 1927, the committee presented its report, containing a suggested form of ordinance "Regulating the moving travel and traffic upon the public ways of the city of Louisville, Kentucky, and providing punishment for the violation thereof." This ordinance, after intensive study by the traffic committee, the public utilities bureau, and various civic organizations, was revised in part and submitted to the General Council on Jan. 24, 1928, for action by that body.

During the year, the following number of cars passed through the various shops:

Truck shop—minor repairs.....	1,402
Truck shop—general overhauling.....	315
Carpenter shop.....	871
Paint shop.....	206

The maintenance of car bodies of the older type of cars continues heavy. The repairs to car bodies during the year, due to accidents and due to maintenance has been as follows:

	No. of Cars	Cost
Due to accidents.....	239	\$8,912.07
Due to car body repairs (maintenance).....	836	\$30,932.32

Increased attention was given during the year to the cleanliness and the attractiveness of car interiors by painting ceilings a lighter shade, renewing curtains, painting seats, etc. Experiments are being conducted in flood lighting the front car dash, designing a suitable illuminated destination sign, and providing more comfortable working conditions for car operators, all of which will tend to increase safety of operation and render the car more attractive to the rider.

The comparative cost of power station operation and maintenance for the past five years is as follows:

1923	1924	1925	1926	1927
\$535,380	\$514,843	\$454,949	\$414,818	\$426,384

During the past year 45 pieces of special track work were renewed in whole or in part, at a cost of some \$84,000, 8,015 ft. of track were re-constructed with new rail, 2,767 ft. with relay rail and 1,078 ft. with the same rail. Of new track construction, 2,642 ft. on Frankfort Avenue from Eastover to Cannon Lane was constructed with new rail, and on 25th Street and St. Cecelia 1,898 ft. was constructed with relay rail, a total of 17,399 ft. During the year a total of 19,275 wood cross-ties were used.

There were only two fatalities on the city lines in 1927 compared with ten fatalities in 1926. The accident elimination contest was continued on the property with increasing success, as is evidenced from the following table:

	1923	1924	1925	1926	1927
Accidents.....	3,404	1,825	1,534	1,157	904
Miles operated per accident..	3,380	6,390	7,432	10,386	13,399

Comparing the year 1923 with 1927, with an increase of 65.8 per cent in the number of automotive vehicle licenses issued, there was a decrease of 73.5 per cent in the number of preventable accidents, and an increase of 400 per cent in the car miles operated per accident. There is to be taken into account also the fact that not only are the streets considerably more congested with automotive vehicles, but the population of Louisville increased from 287,000 in 1923 to 327,000 on Dec. 31, 1927.

The bus competition operated under the name of the Peoples Transit Company, which was stopped by injunction

COMPARISON OF REVENUE, TRANSFER, SCHOOL AND FREE PASSENGERS CARRIED BY THE LOUISVILLE RAILWAY

	1923	1924	1925	1926	1927
January.....	7,861,986	8,435,464	8,297,839	8,633,543	8,228,073
February.....	7,371,936	7,957,906	7,562,261	7,590,218	7,526,871
March.....	8,496,345	8,515,182	8,354,832	8,274,959	8,344,023
April.....	8,341,493	8,422,780	8,214,226	8,145,383	8,157,692
May.....	8,920,188	8,844,856	8,469,877	8,603,531	8,459,179
June.....	8,211,428	8,097,217	7,837,978	7,905,530	7,830,355
July.....	7,943,088	7,712,320	7,648,982	7,697,183	7,493,705
August.....	7,827,996	7,549,678	7,744,573	7,471,624	7,482,858
September.....	8,125,974	7,850,813	7,995,353	8,004,341	7,781,967
October.....	8,257,865	8,334,069	8,395,428	8,235,552	8,206,499
November.....	8,069,261	7,720,786	8,048,480	7,894,275	7,696,159
December.....	8,250,837	8,298,196	8,564,736	8,196,721	8,197,230
Total.....	97,670,397	97,739,267	97,134,565	96,654,860	95,404,611

granted under date of Jan. 28, 1927, was referred to in report for the year 1926 as pending decision in the Court of Appeals. Under date of June 24, 1927, the Court of Appeals affirmed the decision of the lower court, sustaining the contention of the railway that the Peoples Transit Company should not be permitted to operate without a franchise.

Following this decision intensive study was devoted to a co-ordinated electric car and bus system of transportation for the city and suburbs. Changes in city administration delayed consideration of the matter by the city officers.

On Jan. 10, 1928, the officers of the city held a hearing on the matter of bus operation and took under advisement the request of the Louisville Railway to create and sell a franchise for the operation of buses. Attached to this request was a proposed ordinance, which was submitted to the officers of the city. Several provisions of the ordinance drafted by the railway met with objection on the part of the city officers, and a number of conferences were held. On Feb. 7, 1928, Mayor Harrison presented to the General Council of the city an ordinance creating a new bus franchise. While the ordinance presented by Mayor Harrison is more restrictive than the railway's draft would have been to the company as holder of the franchise, the officers regard it as a workable arrangement and have stated that if the franchise is created in the terms suggested by Mayor Harrison the company will bid on it and operate under it. This has since been done.

To add to the railway's equipment, the directors last summer authorized the purchase of the automotive vehicles of the Peoples Transit Company, through which it acquired buses necessary in feeder bus lines. The company stands now in a position to commence building up a comprehensive bus and rail car transportation for the city, as soon as it is legally permitted by the city to do so. All the company needs is the legal right to operate buses and a legal means of determining and rendering the type of service the people desire and are willing to pay for.

During 1927 the current dividends were paid on preferred stock $2\frac{1}{2}$ per cent on April 1 and $2\frac{1}{2}$ per cent on Oct. 1. Dividends of \$1 a share were paid on common stock on April 1 and on July 1; and, on Dec. 13, 1927, there being more than enough balance from operation in 1927 to pay an additional dividend on common stock of \$1 per share, that dividend was declared payable on Jan. 3, 1928. There were paid out of 1926 earnings \$3 per share in common stock dividends, and a like amount out of 1927 earnings.

As was noted in ELECTRIC RAILWAY JOURNAL previously, the American Museum of Safety announced that the Anthony N. Brady Gold Medal, which had not been given since 1914, was awarded the Louisville Railway, the prize committee indicating in its report that the company was the "safest street railway in America."

Barstow Interests Buy Binghamton Bonds

The William S. Barstow interests, which own the Binghamton Light, Heat & Power Company, Binghamton, N. Y., have obtained control of 51 per cent of the block of \$1,782,000 general consolidated 5 per cent bonds of the Binghamton Railway. In consequence the Barstow Company is likely to become the outstanding creditor and claimant against the railway. In any event the purchase eliminates the Associated Gas & Electric Company, New York, from further consideration in the plan for control of the railway.

The sale of the property under foreclosure has been postponed indefinitely pending determination by a special master of the matter of priority of liens of the secured creditors of the railway.

Would Abandon Portion of Line in Cortland

The Cortland County Traction Company, at the request of the city of Cortland, applied to the Public Service Commission May 18 for permission to abandon a part of its line in Cortland. It was alleged that further operation of that part of its system was no longer necessary for public convenience.

Brazil Properties Bought by Electric Bond & Share

The Electric Bond & Share Company has purchased control of important public utilities of the state of Rio Grande do Sul, Brazil, including Companhia Carris Porto Alegrenses and the Companhia Energia Electrica Rio Grandense, respectively operating Porto Alegre tramway and power system. Control of the two companies will be assumed by Electric Bond & Share Company on May 30. The price paid for the two companies has not been disclosed. The railway will be rebuilt.

Increase in Revenue Passengers in Winnipeg

Industrial development in Manitoba, Canada, has been reflected in the 1927 increased railway earnings of the Winnipeg Electric Company, Winnipeg. During that year the railway carried 60,045,833 revenue passengers compared with 57,985,144 during 1926. The gross receipts of this utility increased \$124,000. These better conditions were referred to by A. W. McLimont, president, in his annual statement to the directors.

In accordance with franchise agreements and to meet service requirements, the Winnipeg Electric Company made certain additions and improvements to its railway property in 1927. An extensive track rehabilitation program materially improved the company's roadbed. The company also added to its fleet three Reo 21-passenger buses, three

Studebaker 21-passenger buses, and ten Mack 25-passenger buses.

The report refers to the demonstrations of the value in customers' good will due to the policy of distributing the company's securities through the medium of customer ownership campaigns. There are 4,014 local preferred stockholders compared with only a few in 1924.

Would Abandon Line in Illinois

Abandonment by the Illinois Traction, Inc., of 2.7 miles of line in Champaign County, Ill., is proposed in an application made public May 23 by the Interstate Commerce Commission. The line extends from a point known as State Road Elevator, on the Ogden-Homer branch of the main line, to Homer, Ill.

The applicant states that it is now operating the line at a loss and that the Illinois State Highway Department desires to use the roadbed for construction of a highway between State Road Elevator and Homer.

Negotiations Reported for Sale of Harrisburg Bridge

The Harrisburg Railways, Harrisburg, Pa., is understood to have under consideration a proposal for the purchase by Frank A. Slack of the railway's 60 per cent interest in the People's Bridge Company, owner of the Walnut Street bridge across the Susquehanna River. Mr. Slack proposes to erect a new viaduct at a cost of \$800,000. The railway bought stock in the bridge company more than twenty years ago. The present bridge has been in use since 1890. It cost \$200,000.

Power Plant in Oklahoma Sold

Halford Erickson, vice-president, H. M. Byllesby & Company, announces the purchase by the Oklahoma Gas & Electric Company of the 13,000-kw. Belle Isle generating station of the Oklahoma Railway in Oklahoma City, Okla. Consummation of this transaction follows the recent leasing of this station by the Oklahoma Gas & Electric Company together with transmission lines owned by the Oklahoma Railway, including 33,000-volt transmission lines from the Belle Isle plant to Norman, Guthrie and El Reno, and all substation equipment not used exclusively for railway transportation.

Removal of Non-Paying Oakland Lines Under Way

With the approval of the California Railroad Commission removal of all rails, poles and overhead of two lines abandoned as non-paying by the Key System Transit Company, Oakland, has been started. The lines in question are the San Lorenzo, near San Leandro outside of the Oakland city limits, and the second section of the Ashby Avenue route in Berkeley.

Legal Notes

CALIFORNIA—*Duty of Pedestrian in Crossing Interurban Rights-of-Way Defined.*

The tracks of an interurban railway were on a right-of-way but closely adjoining them was a sidewalk commonly used by pedestrians, and the district was laid out in streets and blocks with business buildings and residences adjacent to the car line on either side. The court held that a pedestrian attempting to cross such tracks must look and listen before crossing, the same rule being applicable as that applying to steam railways, though if the place was one where the public commonly crossed the tracks, in going to a street on the opposite side, evidence to this effect would throw light on the question of the extent of contributory negligence. [Phillips vs. P. E. R. Co., 264 P., 538.]

CONNECTICUT—*Contract for Percentage Payment by Railway for Use of Streets Held Valid. Payment not a "Tax."*

The grant of a city to a street railway to operate cars on its streets, where the company's charter required the consent of the city, was an act of the state so far as the necessary power was committed to the municipality by the state, and the city could attach to the grant any conditions it choose, provided these conditions did not conflict with the law. The condition that the corporation pay 2 per cent of its gross earnings to the city for such permission was valid, and the city was not required to show that it had been put to any additional expense by the construction and operation of the cars. Such a payment did not constitute a "tax" within the meaning of general statute 1887, section 3920, as a tax, according to current meaning, is a burden or charge levied upon persons or property by governmental authority for governmental or public purposes. Where a railway had exercised privileges under such a franchise for 28 years, making the payments required, it was held not entitled to attack the condition as *ultra vires*, where it proposed to continue the exercise of all the rights given to it by the city. Even if the city had no power to impose such a charge but had power to consent or refuse to grant a franchise to a public utility, the latter is bound by the conditions imposed where it has accepted the grant and has operated under it and proposes to continue to do so. [City of Hartford vs. Connecticut Company, 140 A., 734.]

FEDERAL DISTRICT COURT—*Word "railroad" in Bankruptcy Act Includes Street Railway.*

A railway company discontinued service and later was adjudicated a bankrupt. The state and city in which it operated asked that the judication be vacated on the ground that the bankrupt was "a

railroad corporation" and therefore exempted from the federal bankruptcy act. The court differentiated the case from that of other cases where electric railways were held not to be "railroads," such as *In Re Grafton Gas & Electric Light Co.* (253 F., 668), *Omaha Street Railway vs. Interstate Commerce Commission* (33 S. Ct., 890), and declared the word "railroad" in the bankruptcy act included a street railway. [*In re Columbia R., G. & E. Co.* 24 F. (2d), 828.]

FEDERAL DISTRICT COURT—*Boston Elevated Railway Liable to Federal Income Tax.*

Attorneys for the Boston Elevated Railway claimed that because the company, in return for payments and guarantees by the commonwealth, had abdicated its right to manage its property and affairs in favor of public trustees appointed by the Governor, it was not subject to the federal tax on corporations. The district court held, however, that as the business was still conducted in the name of the company and as the enabling act expressly provided that the trustees "shall be deemed to be acting as agents of the company and not of the commonwealth," and because of other wording in the act, the company was liable for the tax. [Boston E. R. Co. vs. Malley 24 F. (2d) 758.]

KANSAS—*Prospective Passenger, Hit by Projecting Steps of Interurban Car, Is Guilty of Negligence.*

A person who intends to get on an interurban car as a passenger at a place provided for that purpose, who goes to that place, sees a car approach and signals it to stop but stands so close to the track that he is struck by the projecting step of the car as it passes him, is guilty of contributory negligence as a matter of law. [Kern vs. K. C. L. & W. Ry., 264 P., 1067.]

KENTUCKY—*Increased Service Not Necessarily Great Public Convenience.*

An applicant for a bus franchise agreed to operate buses every hour over routes already served by buses which ran only every other hour, carrying about one-third of their capacity per trip. The Court of Appeals upheld the decision of the Commissioner of Motor Transportation denying the application on the ground that the public's needs and convenience did not require a more frequent service. [Barnes vs. Consolidated Coach Corporation, 3 S.W. (2d), 1087.]

MASSACHUSETTS—*Person Injured In Crowded Subway Station.*

The fact that a subway station is crowded with people hurrying to enter cars and that similar conditions exist at

other times is not sufficient to establish the negligence of the railroad so as to authorize recovery by a passenger injured by the crowd on the platform. [Martin vs. Boston E. R. Co., 160 N.E., 300.]

NEW JERSEY—*Authority of Commission in Limiting Franchise Upheld.*

The Public Utility Commission granted a certificate to a bus operator on condition he would not carry through passengers between the two terminal towns on its route and that he would not carry local passengers within these two towns. The reasonableness of these limitations was upheld by the Supreme Court. [Hunter vs. Board of P. U. Comm. et al, 141 A., 90.]

VIRGINIA—*Change in Transfer Point, Authorized by Police but Contrary to Ordinance, Held Invalid. Company Held Responsible for False Arrest and Malicious Prosecution of Passenger in Transfer Case.*

A city ordinance, passed in 1908, required the issue of transfers at various specified points. Another ordinance, passed in 1899, authorized the railway company to enforce reasonable regulations as to transfer tickets and systems of transfer to prevent fraud. At a conference held in 1924 between officials of the Police Department and of the railway company to reduce congestion at one of the specified transfer points, it was agreed desirable to require passengers passing the point on certain car lines to transfer at another intersection. Notices of this proposed change were posted and other means were taken to warn passengers of the change. More than two months later, a passenger transferred at the old corner, but declined to pay another fare or get off the car after his transfer was refused. He made no other disturbance, but the conductor had him arrested, and he spent 30 minutes in the Police Station, after which he was released on bail. The next morning the company's attorney prosecuted him in the police court for disorderly conduct, but the case was dismissed. It was alleged that the arrest had been made under general instructions issued by the company. In a later action for false arrest and malicious prosecution brought by the passenger against the company, the Virginia Special Court of Appeals held that neither the agreement between the company and the Police Department nor the right of the company to establish regulations on the use of transfers gave it authority to change the location of transfer points, as they had been fixed by the city ordinance. Hence there was no obligation on the passenger to pay an extra fare or leave the car. The court also held that the instructions issued by the company to its employees made it responsible for the prosecution and warranted the trial jury in assessing punitive damages. A verdict of \$2,000 against the company was upheld. [V. E. & P. Co. vs. Wynne, 141 S.E., 829]

Personal Items

Walter L. Adams Heads New Massachusetts Organization

"From horse car driver to street railway rehabilitator" would be a fitting title for Walter L. Adams of Milford, Mass., recently appointed president and general manager of the reorganized Milford, Framingham, Hopedale & Uxbridge Street Railway (formerly Milford & Uxbridge Street Railway). He is typical of the men who are doing so much to bring New England's street railways to their pre-war financial standing.

It was in 1888 that Mr. Adams had



Walter L. Adams

his first experience in railroading as a horse-car driver on the old Newbury & Amesbury Railway. His run, now remembered only by the "old timers," was on the Merrimack branch. He continued as a driver for two years and later, when cars came into existence there, he was promoted to foreman of the carhouse. Soon after when the lines were electrified his personal study and knowledge won for him the position of electrical engineer. In this capacity he received the fundamental training which stood him in good stead later.

Greater opportunity was offered him in Connecticut. In 1892 he accepted an offer to go there and equip the Norwich Street Railway with electricity. It was then a horse-car road. He was made superintendent and electrical engineer. In a short time an aggressive campaign resulted in the complete change-over and his work was successful. For a brief period he was connected with the Westinghouse Electric Company as an engineer, returning later to the Norwich Street Railway. This time he was made superintendent of the Montville Street Railway where he stayed until 1903. After his work there he went to Milford and became superintendent of the Milford & Uxbridge Street Railway. Reactions following war time inflation resulted in the company's going into a receivership on Aug. 4, 1926. Mr. Adams was appointed receiver. Early

in May, this year, the company was sold under order of the Supreme Court to the Citron-Byer Company of New Jersey. Mr. Adams was retained by the new owners as president and general manager. He is also president of the Milford, Framingham & Uxbridge Coach Company.

Mr. Adams was born in Newbury, Mass., in 1858. He was educated in the Newbury public schools.

F. W. Samworth Holds Important West Virginia Post

F. W. Samworth is now serving as district general manager of the Ohio Valley Electric Company and its affiliated companies. He has before him the gigantic task of carrying forward the development work incident to the comprehensive program initiated since the city and interurban lines in West Virginia passed from control of the Appalachian Electric Power to the Central Public Service Corporation. More recently the Cannon Ball Transportation Company and the Interstate Motor Transit Company were purchased by the Southern Gas Securities Company, a subsidiary of the Central Public Service Corporation. The Central Public Service Corporation now controls all of the urban and interurban transportation systems in and between Huntington, W. Va., and Portsmouth, Ohio. The services will be co-ordinated with other transportation companies owned by the Central Public Service Corporation.

Mr. Samworth started his electric railway career in 1910 as a motorman with the Wilmington City Railway, Wilmington, Del. Prior to his position in Huntington and the assumption of his present job, he worked successively as



F. W. Samworth

motorman, receiver, dispatcher, superintendent and general superintendent.

Mr. Samworth was born on Feb. 23, 1892, at Wilmington. His education was received at the Mount Herman School, Mount Herman, Mass.

H. R. Bowie Advanced on Penn-Ohio

H. R. Bowie has been appointed auditor of the Pennsylvania-Ohio Power & Light Company and Pennsylvania Power Company, and auditor and secretary of associated companies of the Penn-Ohio System, Youngstown, Ohio. In this work he succeeds F. E. Wilkin, who resigned to join the staff of Stevens & Wood, Inc.

Mr. Bowie has been assistant auditor of the Penn-Ohio System for the last nine years. During the war he served in the cost accounting section of the army ordnance department. Stationed in New Haven, Conn., he had charge of the government accounting of one of the largest army contracts at the plant of the Winchester Repeating Arms Company. Prior to his war service Mr.



H. R. Bowie

Bowie was an accountant for the Pacific Light & Power Company and Southern California Edison Company. He is a native of Uniontown, Pa., and was graduated from the University of Southern California in accounting and commercial law.

Obituary

W. H. McLARIN, president of the Fairburn & Atlanta Railway & Electric Company, Fairburn, Ga., since 1922, died on May 20. Mr. McLarin was 75 year old.

FRANK STARK, associated with the late E. P. Shaw in the construction of the Salisbury Beach & Plum Island Street Railway lines over which he served as superintendent for many years, died in Newburyport, Mass., on May 15. He retired from active work about five years ago, just previous to which he had been starter for all lines centering in Market Square, Newburyport, into which both the Eastern Massachusetts Street Railway and the Massachusetts Northeastern operate.

MARC STANFIELD, superintendent of the bus division of the Indiana Service Corporation, Fort Wayne, Ind., for the last two years, died on May 5.

Manufactures and the Markets

Manufacturers Talk of Price Cutting

A group of selected letters, discussing who's to blame and commenting on possibilities for reform

MANY manufacturers have testified to the price cowardice of sellers as the chief cause of demoralization in the market place, as a result of the recently published articles by Earl White-horne on price cutting. Also many constructive ideas have been advanced. Some purchasing agents have stoutly contested the innocence of the buyer. Others have frankly argued for a broader recognition of the economics of purchasing and more ethical practices. The following series of extracts from letters from the executives of manufacturing companies has been selected from the pile to present a cross-section of the sellers' viewpoint, as it has been reflected by readers of these articles.

Destroying Price Levels for Allied Lines

By a Manufacturer of Control Apparatus

Since the seller has the privilege of either accepting or refusing business, weak-kneed selling is principally to be blamed for the present price cutting situation. . . .

A contributing factor to the bad price situation also lies in the lack of loyalty among the allied industries. While the motor manufacturer may maintain the price on his motors, because of the longer discount which he is receiving from the control manufacturer he has quite a bit of leeway in discount to play with, and does not hesitate at all to turn a good portion of this discount over to the buyer. Time and again we control manufacturers are up against a situation where the customer can buy our control cheaper through a motor manufacturer than from us direct. This naturally gives the control buyer a considerable leverage with which to lower the control manufacturer's price.

One-Price Policy a Cure

By a Bearing Manufacturer

The only practical solution is to encourage both purchasing agent and seller to submit closed quotations which shall not be subject to further change. If the manufacturer would stick by his first price the purchasing agent would be unable to gain anything by quasi-crooked purchasing methods. If the purchasing agent would at the outset state that he would not lend himself to such practices and insist upon the best price once and for all, then many of the complaints would be avoided.

Too Much Salesmen's Gossip

By a Pole Line Hardware Manufacturer

We do not believe that the manufacturers who are selling a competitive line are close enough that they can sit down and talk over their difficulties without the conversation being broadcast.

The manufacturers pay too much attention to salesmen's gossip about his competitor cutting prices, but if the competitive manufacturers were so lined up that

they could discuss costs with each other, I believe a lot of the trouble would be eliminated.

Most Purchasing Agents Absolutely Square

By a Lighting Equipment Manufacturer

Our experience has been that not much of the temptation for price cutting is due to any desire of the purchasing agents of large buyers to keep us from a legitimate profit. The purchasing agent is more concerned in a fair price, coupled with quality of goods and prompt deliveries.

We find purchasing agents of large buyers are absolutely "square" and willing to see us make a legitimate profit. There are still a few of the "old school" who feel a day's work well done only when they have lied to a bunch of salesmen, thereby keeping their companies from earning a legitimate profit, but that type is fast dying out or being placed in other positions where they are not so harmful to their employers.

Untrained Salesmen a Weakness

By a Manufacturer of Fans and Blowers

The tendency today in our own industry is to have untrained men and place them out in the field. The result is their lack of real engineering ability, their lack of ingenuity in meeting the unusual situation causing them to waver in their determination to sell at the right price, and consequently they phone the factory for reduction in price, making their case as strong as possible with the factory that the competitors are cutting prices. Invariably the salesman either deliberately misrepresents conditions or he merely took the word of the purchasing department or the buyer.

Sliding Scale and Reciprocity

By a Controller Manufacturer

There are two other phases of merchandising electrical apparatus that have crept in during the last few years that I feel are detrimental to the business. One is the practice of establishing a sliding scale of discounts, started by one of the large electrical manufacturers, and copied by many others in self-defense. This system gives large purchasers preferential discounts on account of the potential buying power of these big customers, and additional quantity discounts worked out on a sliding scale, paid in the form of rebates at the end of the year. Any manufacturer expects to make a certain over-all profit on his products and in order to give big discounts, his list prices must be based accordingly. The customer of small purchasing power consequently pays an excessive price for the apparatus that he buys and the additional profit made on these sales helps the large and powerful purchaser to obtain his goods at a discount.

The other condition is the use of reciprocity to coerce purchasers to buy electrical equipment. The ultimate outcome, if the buyers of electrical equipment do not offer strenuous resistance, would be to eliminate

Exhibitograph No. 10

BIG SHOW!

A.E.R.A. Exhibit Committee

Reports

to May 31

186 Exhibitors

103,613 Sq.ft. of Space Sold

**BIGGER AND BETTER
THAN EVER**

the small electrical manufacturer who does not have big tonnages of steel and other commodities to place. This company has suffered to a considerable extent from the reciprocity pressure, as a number of good sized orders which were about to be placed with us have been diverted to the large manufacturers due to threats on their part to cease buying from the customer unless the orders were placed with them.

Product Prestige Proof Against Price

By an Insulator Manufacturer

The purchasing agent is simply a salesman on the other side of the fence or a salesman a purchasing agent with change of residence and both aping the Dutch and Indians on the Manhattan purchase—where both thought they had, and wondered if they had, put over a good deal.

The purchasing agent, in a seller's market, doesn't dare ask, "Is this your best price?"—the sales agent insults easily. So, in a buyer's market, the purchasing agent dares and does ask and by the time this reaches the sales end it is amplified orally into a demand and visually into an ogre across the desk.

Constructively, I will say that I don't blame either side; that the most salutary movement among the large buyers is the selection of engineers of purchase instead of purchasing machines (clerks). To an engineering mind, one need not get blue in the face trying to explain that the reason "Your price is high" on 60,000 bolts (insulators?) is that there are 50 different kinds of steel and as many methods of making bolts.

Finally, all this dilemma may be avoided by making and selling a product so good that buying and using it is a pleasure not to be contaminated by "an extra 10 and two 5's."

Tie Requirements Will Decline

As the day of large railroad expansion is past and the yearly increase in track mileage has greatly slowed down, there is seen a prospect of a diminishing demand for crossties until the minimum annual renewal, as fixed by the life of treated ties, is reached. When this point is reached, only such increase in the demand may be expected as will be due to the construction of new lines or the addition of tracks to existing facilities.

Treated ties have been used for years in increasing numbers until in 1926 the treated ties were 69 per cent of all ties used. In 1923 the amount of treated ties in use was 50 per cent and if the

rate of increase of the past three years continues, by 1932 practically all ties used will be treated ties.

The effect of the treated tie on the number of ties required for renewals, according to Earl Stimson, chief engineer of maintenance of the Baltimore & Ohio Railroad, is clearly indicated by the number of ties used and the total miles of all tracks on which renewals were made, for which the figures for the years 1921 to 1926, inclusive, are available: In 1921, there were used 86,521,556 ties in 379,254 miles of track, or 228 ties per mile. In 1926, there were used 80,745,509 ties in 394,945 miles of track, or 204 ties per mile.

Thus, notwithstanding the fact that there was an increase of 15,691 miles of track during this period, 5,776,047 less ties were required for renewals in 1926 than in 1921.

In 1926 there were used for renewals 80,745,509 ties, or 204 per mile of track, and in the same year there were used for the construction of additional tracks 9,530,926 ties, or about 2,600 ties per mile of track. The decrease in renewals since 1921 is 24 ties per mile of track, or at the rate of 4 ties per mile, per year. The net increase in track mileage for the same period is 2,615 miles per year, and for the purpose of computation assume a gross added mileage per year of 3,000, which will require a total of 7,800,000 ties to construct.

Assuming a twenty-year life for treated ties, with all ties in track treated, the renewal will finally resolve itself into 130 ties per mile per year. Projecting by the straight line method, the present rate of decrease of renewals of four ties per mile per year, it will require 18½ years to reduce the 1926 renewal of 204 ties per mile a year to this figure of 130 ties per mile a year. This will be in the year 1944. When this state of renewals is reached the annual renewal requirements will be uniform and for the 1926 mileage of 394,945 will be 51,342,850 ties.

With this, however, must be considered the ties used in constructing new lines and extensions during this period which are assumed at 7,800,000 per year and which gives a total for the 18½ years of 144,300,000 ties, of which about 40,000,000 ties would have been renewed at the end of the 18½ years.

The average renewal in this group at the end of the 18½ years would be approximately 4,000,000, which added to the 51,342,850 ties required for the 1926 mileage, gives a total of 55,342,850 ties for the 1944 renewal, plus the 7,800,000 for the construction of new lines and extensions, making a total of 62,142,850 ties to meet the demands in the year 1944, as compared with the demands of 1926 of 90,276,435 ties, which is a reduction of 31 per cent.

At this point the full benefit of the treated tie has been secured and the average low level of crosstie requirements has been reached. Beyond this point the renewals per mile should remain stationary, but the total number of ties required for both renewals and for new tracks will increase as the track mileage increases.

METAL, COAL AND MATERIAL PRICES
F. O. B. REFINERY

	May 29 1928
Metals—New York	
Copper, electrolytic, cents per lb.....	14.525
Copper wire, cents per lb.....	16.625
Lead, cents per lb.....	6.30
Zinc, cents per lb.....	6.475
Tin, Straits, cents per lb.....	50.625
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons.....	4.175
Somerset mine run, f.o.b. mines, net tons...	1.875
Pittsburgh mine run, Pittsburgh, net tons..	1.8
Franklin, Ill., screenings, Chicago, net tons	1.70
Central, Ill., screenings, Chicago, net tons..	1.5
Kansas screenings, Kansas City, net tons...	2.50
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.....	5.65
Weatherproof wire base, N.Y., cents per lb.	17.125
Cement, Chicago net prices, without bags..	2.05
Linseed oil (5-bbl. lots) N. Y., cents per lb.	10.8
White lead in oil (100-lb. keg), N. Y., cents per lb.....	13.75
Turpentine (bbl. lots), N. Y., per gal.....	\$0.59

Air-Magnetic Brake Test Made

Demonstrating the operation and effectiveness of its air-magnetic brake, the Cincinnati Car Company gave a series of tests on the tracks of the Indianapolis & Southeastern Railway, on May 25 under the supervision of the A. C. Nielsen Company of Chicago.

The tests were made with the Cincinnati experimental car on a measured stretch of track. It will be noted from the accompanying table that the air-magnetic brake stopped the car in approximately two-thirds of the time and distance required by the air brake alone. It is also interesting to note that the efficiency of the air brakes alone was decreased considerably on the greased track while the magnetic brake alone stopped the car in nearly the same distance on the oiled track as on the dry track, thus illustrating the magnetic function of the brake.

LIST SHOWING COMPARISON OF AIR-
MAGNETIC BRAKES WITH AIR BRAKES
ALONE AND MAGNETIC BRAKES ALONE

Speed of car at brake application was 60 m.p.h.

	Test	Track	Distance to Stop, Feet	Line to Stop, Seconds
Air brakes only.....	1	Dry	1,100	22
	2	Dry	1,162	23 2/5
	3	Oiled	1,958	38 1/5
Magnetic brakes only	1	Dry	2,048	40 2/5
	2	Dry	2,036	39 2/5
	3	Oiled	2,116	42 2/5
Air-magnetic brakes	1	Dry	755	14 2/5
	2	Dry	722	14
	3	Oiled	1,357	29 1/5

ROLLING STOCK

NORTHERN OHIO POWER & LIGHT COMPANY, Akron, Ohio, has received one gas-electric drive, urban type Twin Coach from the Twin Coach Corporation, Kent, Ohio.

CUMBERLAND & WESTERN PORT TRANSIT COMPANY, Frostburg, Md., has purchased two 100-hp. six-cylinder White buses.

INTERBOROUGH RAPID TRANSIT COMPANY, New York, has ordered G.E. equipments for the conversion of 30 trailer cars to motor cars.

DALLAS RAILWAY & TERMINAL COMPANY, Dallas, Tex., will purchase about fifteen Peter Witt street cars at an approximate cost of \$240,000 according to plans being made by city officials and the railway.

WORCESTER CONSOLIDATED STREET RAILWAY, Worcester, Mass., has ordered ten 33-passenger, Yellow coaches.

INDIANAPOLIS & SOUTHEASTERN RAILWAY, Indianapolis, Ind., is reported to be buying ten cars from the Cincinnati Car Company.

TRACK AND LINE

BERKSHIRE STREET RAILWAY, Pittsfield, Mass., is planning to install a 600-ft. diamond switch for the benefit of trolley service to employees of the General Electric Company. The work is to be done at the same time the city does paving work in that section, bids for which are now out.

SPRINGFIELD STREET RAILWAY, Springfield, Mass., will soon begin the replacement of 2,746 ft. of double track on State Street between the New York, New Haven and Hartford Railroad crossing and Benton Street. Progress is being made in replacing the single tracks on a somewhat longer stretch on Wilbraham Road, from the New York, New Haven & Hartford crossing to the eastern end of the line.

NORTHERN OHIO POWER & LIGHT COMPANY, Akron, Ohio, is laying new double track on Cornell Street in Barberton.

SHOPS AND BUILDINGS

APPALACHIAN ELECTRIC POWER COMPANY, Charleston, W. Va., plans a substation to cost about \$150,000.

UNION ELECTRIC LIGHT & POWER COMPANY, St. Louis, Mo., is planning a substation to cost approximately \$200,000.

NEW YORK CENTRAL RAILROAD, New York, is receiving bids for a 2,000-kw. rotary converter and a 2,100-kva. transformer for substation service.

OHIO PUBLIC SERVICE COMPANY, Cleveland, Ohio, will build an addition to its Edgewater power plant to cost \$450,000.

TRADE NOTES

C. O. BARTLETT & SNOW COMPANY, Cleveland, Ohio, announces the appointment of J. R. Allison, in its Pittsburgh office at 406 Bessemer Building. Mr. Allison has a wide experience in both maintenance and construction in steel mills and railroads.

NORTHERN ENGINEERING WORKS, Detroit, Mich., recently appointed the Interstate Supply Company, Philadelphia, Pa., as direct factory representative for the Philadelphia district; W. H. Beyer assuming charge of the account.

Washington Railway New Cars Scheduled for April Delivery

Details of the twelve cars for the Washington Railway & Electric Company, the order for which was mentioned in the JOURNAL for Dec. 17, 1927, have recently been released. The order for the units was placed with the J. G. Brill Company, Philadelphia, Pa. The cars will have an overall length of 42 ft. 3 in., a seating capacity for 49 passengers, and will be of semi-steel construction. The exterior color scheme is to be cream and blue and the interior trim gray enamel and cherry. Four GE-265-A outside-hung motors are specified. Subjoined are the specifications as released by the Washington Railway & Electric Company.

Number of units.....	12
Type of unit.....	One-man, motor, passenger, city double-end, double-truck
Number of seats.....	49
Builder of car body.....	J. G. Brill Company, Philadelphia, Pa. April 1, 1928.
Date of delivery about.....	21,840 lb.
Weight of car body.....	18,360 lb.
Weight of truck.....	40,200 lb.
Total weight.....	42 ft. 3 in.
Booster centers.....	28 ft. 5 in.
Length over all.....	4 ft. 10 in.
Truck wheelbase.....	11 ft. 8 in.
Width over all.....	29 1/2 in.
Height, rail to trolley base.....	Semi-Steel
Window post spacing.....	Monitor
Body.....	End, folding feature
Roof.....	Plain
Doors.....	Westinghouse with variable load
Air brakes.....	Specification A-20-21
Armature bearings.....	A.S.T.M. Faraday high voltage
Axles.....	Westinghouse DH-16
Car signal system.....	Flexible
Compressors.....	R-35-JJ
Conduit.....	Pantastone
Control.....	Curtain Supply Company
Curtain fixtures.....	Keystone
Curtain material.....	National Pneumatic
Destination signs.....	Arthur power recorder
Door mechanism.....	Cleveland
Energy saving device.....	Paint
Fare boxes.....	Flexolith
Finish.....	Tool Steel Gear & Pinion Company
Floor covering.....	Plain
Gears and pinions.....	Peacock Staffless
Glass brakes.....	Buffalo type
Hand straps.....	Railway Utility
Heaters.....	Crouse-Hinds
Headlights.....	Agasole
Headlining.....	Gray enamel and cherry
Interior trim.....	Brill
Journal bearings.....	Electric Service Supplies
Journal boxes.....	Company, dome type
Lamp fixtures.....	Four GE-265-A, outside hung
Motors.....	Four GE-265-A, cream and blue
Painting scheme.....	Canvas
Roof material.....	Brill de luxe
Safety car devices.....	Westinghouse Traction Brake Company
Seat fixtures.....	Curtain Supply Company
Seats.....	29 1/2 in.
Seat spacing.....	Genuine leather
Seating material.....	Folding
Steps.....	Kass
Step treads.....	Ohio Brass
Trolley catchers.....	Ohio Brass
Trolley base.....	More-Jones
Trolley wheels.....	Brill 76-E-1
Trucks.....	Railway Utility Company
Ventilators.....	30-in., chilled iron
Wheelguards.....	Root

Nation's Capital repeats on "Peacock" Staffless Brakes

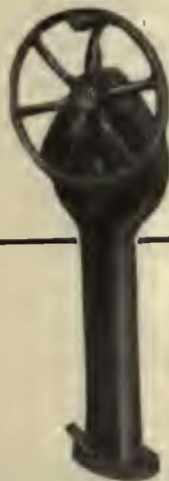
Reg. U. S. Pat. Off.

Twelve new one-man, double-end, double-truck city cars have just been placed in service by the Washington Railway & Electric Co., Washington, D. C.

Built by the J. G. Brill Co., the new cars have a seating capacity of 49 passengers and are of semi-steel construction.

Not only in its Capital, but throughout the Nation, when new cars are ordered "Peacock" Staffless Brakes are usually found in the "repeat" specifications.

May we tell you why?



The Peacock Staffless

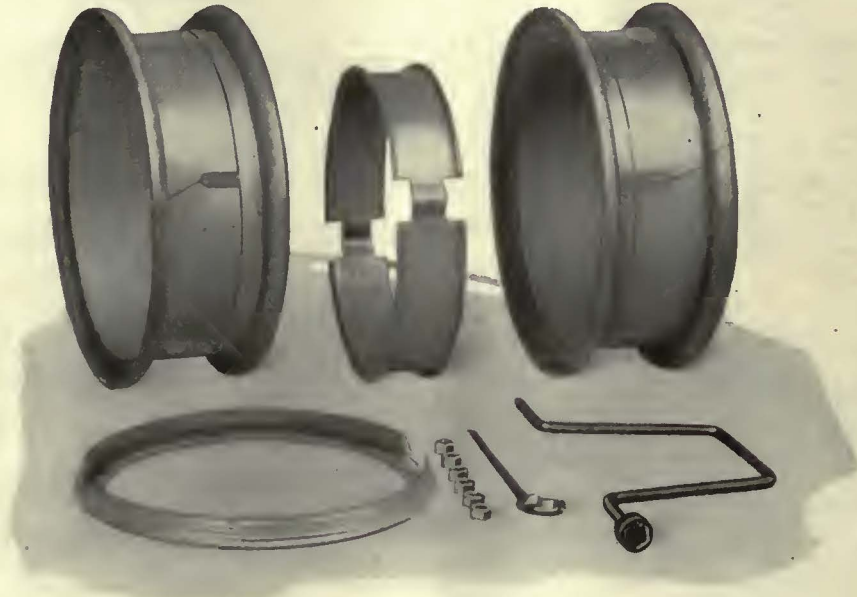
National Brake Company, Inc.

890 Ellicott Square, Buffalo, N. Y.

Canadian Representative

Lyman Tube & Supply Co., Ltd., Montreal, Can.

Demount your Truck Tires— In Half the Time, With Half the Effort, and only Half the Weight to Handle



with GOODYEAR TYPE "K" RIMS

Goodyear Type "K" Rims, made in two parts, an endless section and one split section, make changing pneumatic tires on trucks and buses an easy task—no trouble or strain. The tire is demountable at the rim and there is only half as much weight to handle.

Type "K" Rims are adaptable to all wheels, single or dual. They save tires by reducing brake drum heat through ventilated wheels. Though light in weight, these rims are powerful. When replacement is necessary, the cost is small.

Truck owners changing from solid or

cushion tires to pneumatics will find them *efficient, economical and practical*. They meet every possible requirement in truck or bus rims.

Truck manufacturers who wish to meet popular demand by equipping their trucks with Type "K" Rims will receive active cooperation from Goodyear engineers. These rims will be the standard for pneumatic tired trucks of the future.

Truck, bus and tire dealers should write *at once* to Goodyear, Akron, Ohio, or Los Angeles, California, for full information on this revolutionary rim equipment.

GOODYEAR

Type K Truck & Bus Rim Equipment

Modern Cars

for increased earnings



With all the
Modern Features
the street car is becoming
the preferred method
of transportation

ON many properties, both city and interurban lines, new cars of the modern type are attracting more patronage and operating at less expense than the older cars they replaced. New cars will do the same on your property.



CUMMINGS CAR AND COACH CO.
111 W. Monroe St.
Chicago, Ill.



No. 392-A

Walkover

deep spring edge
divided cushions
divided concave
spring edge
back



*A seat that invites
even the most
discriminating!*

THIS H. & K. Walkover Seat No. 392-A with its wealth of comfort and its de luxe appearance, invites the most discriminating among passengers. An ideal seat for city lines! The 50 new cars for the Worcester (Mass.) Consolidated Railway are excellent examples of modern interiors fitted with this type of Hale & Kilburn Seats.

Whatever type of up-to-date seats you require—whether for city or interurban lines—whether for new cars and buses or for remodelled cars and buses—if you want the best get in touch with Hale & Kilburn. Hale & Kilburn seats set the highest standards of modern design, comfort, appearance and durability. *Write for latest Bulletins.*

HALE & KILBURN COMPANY

General Offices and Works: 1800 Lehigh Avenue, Philadelphia

SALES OFFICES:

Hale & Kilburn Co., Graybar Bldg., New York	T. C. Coleman & Son, Starks Bldg., Louisville
Hale & Kilburn Co., McCormick Bldg., Chicago	W. L. Jeffries, Jr., Mutual Bldg., Richmond
E. A. Thornwell, Candler Bldg., Atlanta	W. D. Jenkins, Praetorian Bldg., Dallas, Texas
Frank F. Bodler, 903 Monadnock Bldg., San Francisco	H. M. Euler, 146 N. Sixth St., Portland, Oregon
C. S. Wright, 68 Temperance St., Toronto, Ont.	

**Hale and
Kilburn SEATS**



The Tires Deluxe for Motor Buses—

More than four hundred bus lines throughout the country are profiting from Firestone experience and leadership in the bus tire field. This is the result of better engineering, better materials and absolute uniformity in quality and workmanship. Firestone's special mileage-building processes and methods, such as Gum-Dipping, are establishing remarkable records in every field of tire service—but especially in heavy duty bus service where stamina counts the most.

Every day, the safety and trouble-free performance of Gum-Dipped Tires are playing a vital part in main-

taining schedules, improving operating efficiency, adding to profits and strengthening the public Good Will.

No bus line in America can afford to ignore the work that Firestone is doing toward the advancement of Motorbus Industry. No matter what tires you are now using, nor where you are located, it will pay you to investigate Firestone equipment and the Firestone Proposal of Service, which Firestone Dealers are making available to operators at terminal points and intermediate stops along every main highway in the country.

MOST MILES PER DOLLAR

Firestone

Gum-Dipped **TIRES**

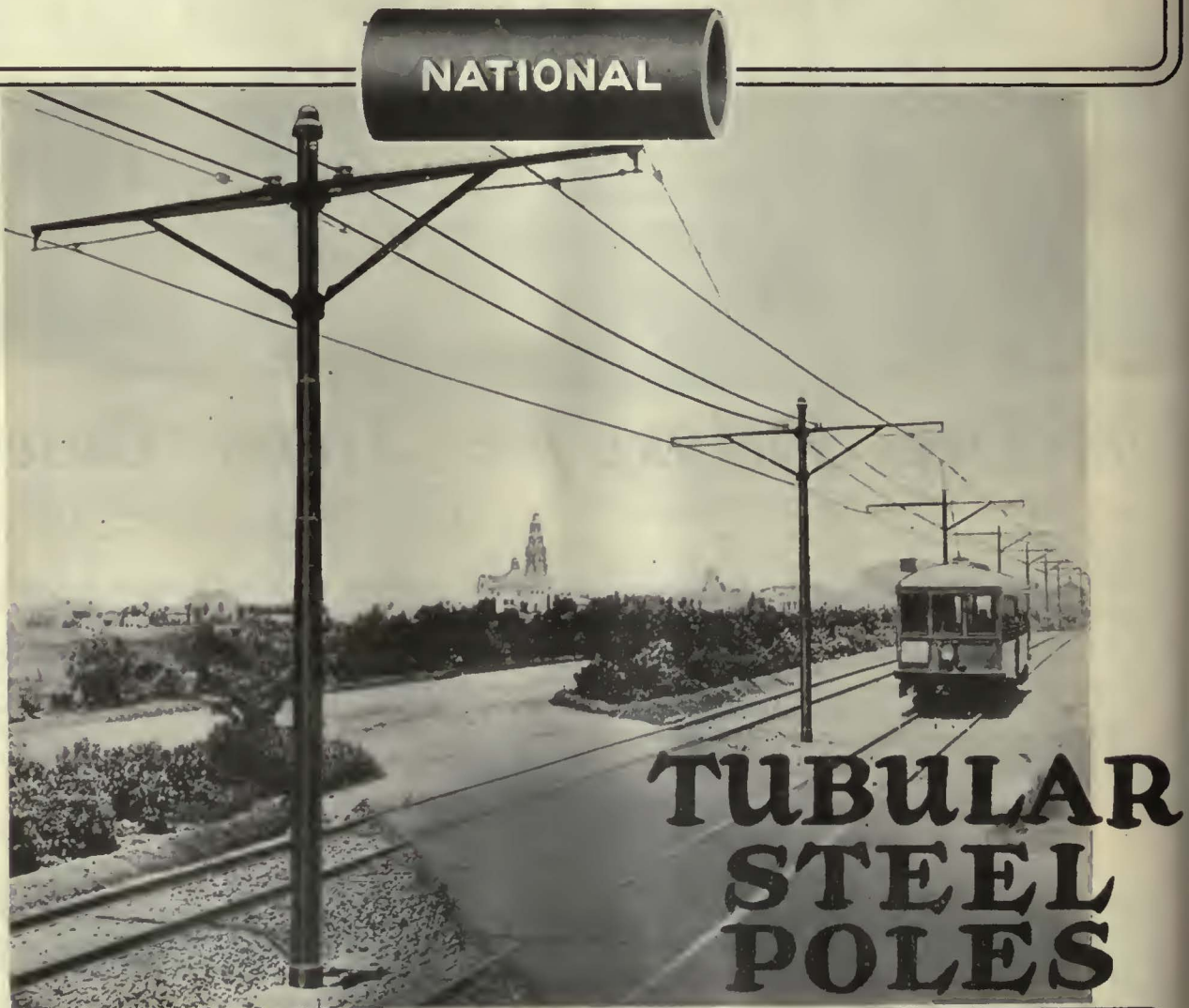
AMERICANS SHOULD PRODUCE THEIR OWN RUBBER . . . *Harvey S. Firestone*

Preference from this standpoint

GENERAL dependability, the necessary factor demanded today in line poles, is represented in a high degree in "NATIONAL" Tubular Steel Poles—the principal reason for their preference by leading traction companies throughout the country.

Made by the largest manufacturer of tubular products in the world, by skilled workmen under expert supervision; put through severe tests which represent the hardest kind of service conditions—"NATIONAL" Poles include the desired advantages of durability—strength—low upkeep—and attractiveness—which make up general dependability in service.

Note in the illustration below the clean-cut, neat appearance which "NATIONAL" Poles give to this electric line. Our engineers will be glad to cooperate with you and offer suggestions concerning installation of these poles. Bulletin No. 14—"NATIONAL" Tubular Steel Poles—will be sent upon request.



NATIONAL TUBE COMPANY, PITTSBURGH, PA.
District Sales Offices in The Larger Cities



Underground, Overhead and on the Surface

Underground, overhead and on the surface the electric railway works to carry out its titanic daily task—the movement of a large portion of the city's population in the narrow confines of the rush hour.

In such circumstances *dependability* must be the first requirement of electric railway equipment. GARY WROUGHT STEEL WHEELS are designed, made and inspected with this requirement in mind. Our wheel engineers are at your service.

Illinois Steel Company

General Offices: 208 South La Salle Street
Chicago, Illinois

American Steel ^{and} Wire Company

A Bond of the Past

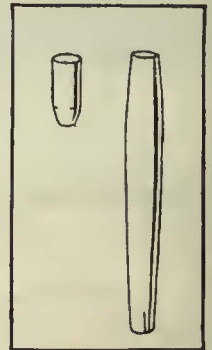


- of the Present *- and of the Future*

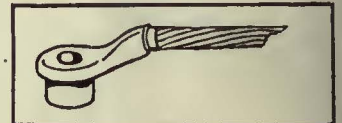
Various types of bonds have been developed to simplify installation without sacrificing performance, but none have met with greater favor than the Pin Terminal Rail Bond.

No cumbersome machinery or special tools are required to install this type of bond. A few blows from a hammer and the rail is efficiently bonded:—as simple as driving a nail. The only requisite for a lasting contact is a clean hole of proper size.

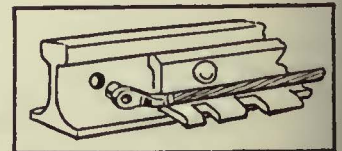
For the future:—high electrical conductivity and simplicity of application, assure extension of the use of Pin Terminal Rail Bonds.



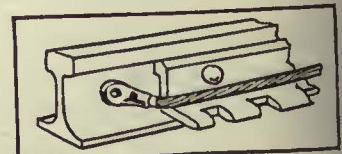
The pin and taper punch



The bond



The bond in position for application. Drive the taper punch through, then the permanent pin.



The bond installed.
What can be easier?

SALES OFFICES

Chicago
New York
Boston

Atlanta
Birmingham
Cleveland

*San Francisco

Worcester
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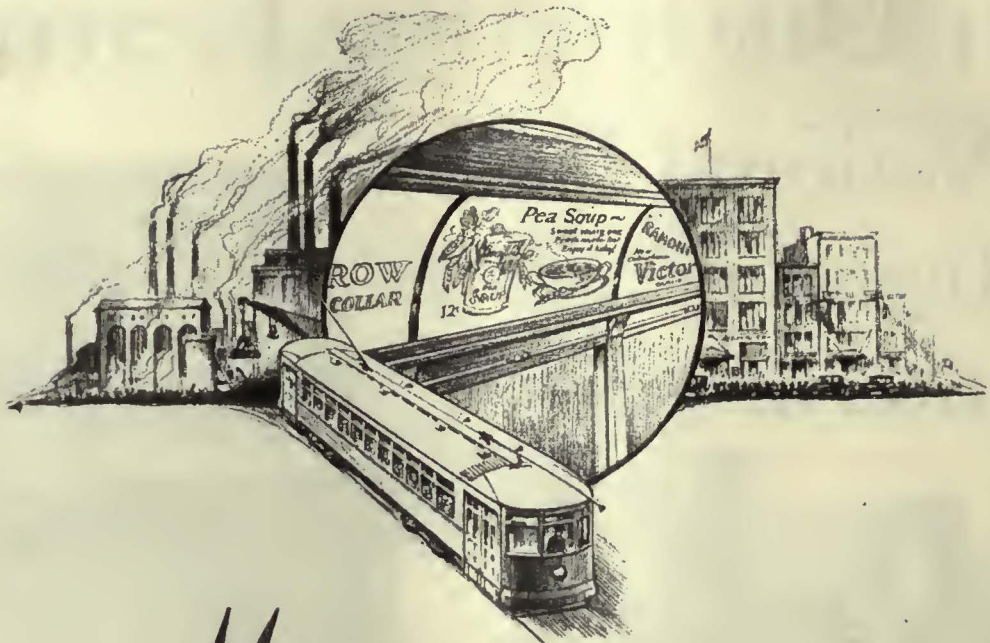
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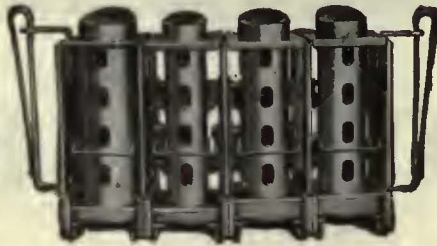
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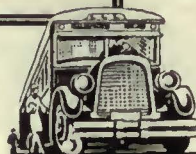
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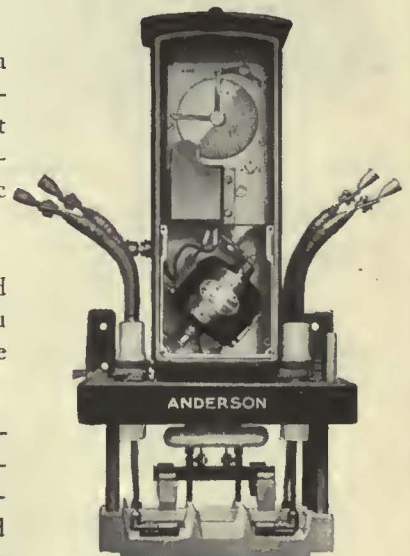
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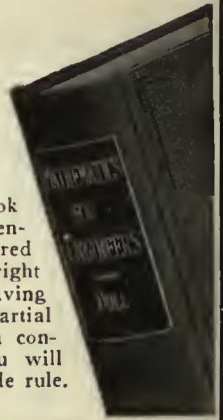
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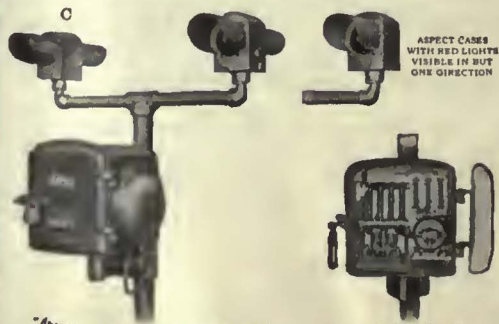
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Elec. Service Supplies Co.
Ohio Brass Co.
Westinghouse E. & M. Co.
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American Steel & Wire Co.
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American Steel & Wire Co.
Anaconda Copper Mining Co.
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Brill Co., The J. G.
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- Crossings, Trolley**
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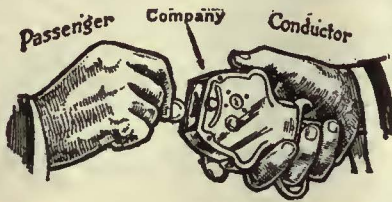
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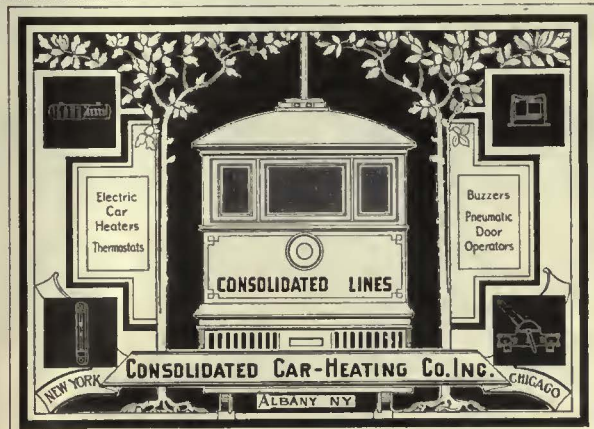
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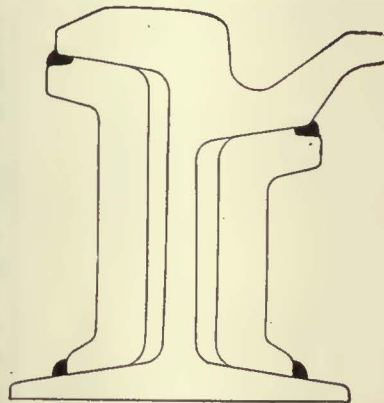


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Tires Firestone Tire & Rubber Co. Goodyear Tire & Rubber Co.	Trolley Cars Brill Co., The J. G. General Electric Co.	Turbines, Steam General Electric Co. Westinghouse E. & M. Co.	Welding Steel Railway Track-work Co. Una Welding & Bonding Co.	Wheel Guards (See Fenders and Wheel Guards)
Tongue Switches Wm. Wharton, Jr. & Co.	Trolley Material, Overhead Anderson Co., A. & J. Elec. Service Supplies Co. General Electric Co. Ohio Brass Co. Westinghouse E. & M. Co.	Turnstiles Elec. Service Supplies Co. Perey Mfg. Co., Inc.	Welding Wire and Rods Railway Track-work Co.	Wheel Grinders Wheel Truing Brake Shoe Co.
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Towers and Transmission Structures Westinghouse E. & M. Co.	Trolley Wheel Bushings Star Brass Works	Valves Ohio Brass Co. Westinghouse Tr. Br. Co.	Welding Wire and Rods Railway Track-work Co.	Whistles, Air Ohio Brass Co. Westinghouse E. & M. Co. Westinghouse Traction Brake Co.
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Track, Special Work Columbia Machine Works Ramapo Ajax Corp.	Trucks, Car Bemis Car Truck Co. Brill Co., The J. G.	Varnishes (See Paints, etc.)	Welding Wire and Rods Railway Track-work Co.	Wire Rope American Steel & Wire Co. Roehling's Sons Co., J. A.
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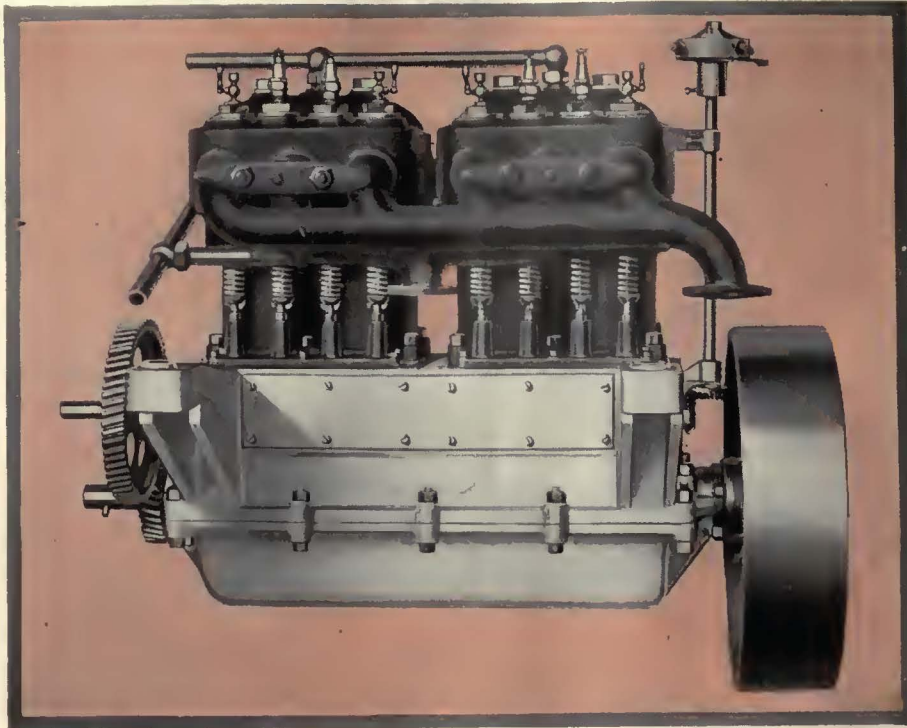
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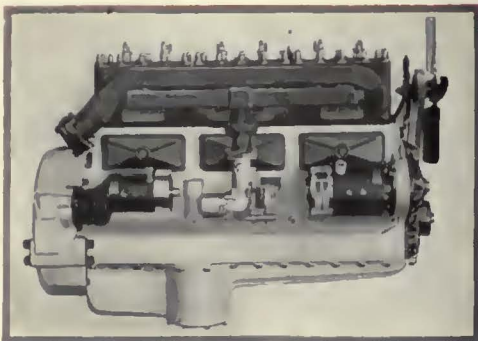


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